# ISLAMIAH COLLEGE
## (AUTONOMOUS)
## VANIYAMBADI – 635 752

### (AIDED & SELF FINANCE)

# SYLLABI BOOK- IV

### 6th Academic Council

### 15th FEBRUARY 2015

# *DEPARTMENT OF HISTORY*

# ISLAMIAH COLLEGE (AUTONOMOUS), VANIYAMBADI

# III B.A. HISTORY

# SYLLABUS

**V SEMESTER** **CORE PAPER IX**

## HISTORY OF THE ARABS FROM 500 TO 750 AD

**(Hrs/Week: 5, Code: U3HI5001, Credit: 4)**

**Objectives**

To introduce about pre-Islamic Arabia
To brief about the advent of Islam
To highlight the basic tenets of Islam
To explain the impact of Islam on the Arab society
To list out the different Caliphates and their significance

**UNIT - I**

Geography of Arabia –Jahiliya Period – Political, Social, Cultural and Religious Life of the Arabs

**UNIT - II**

Prophet Muhammad (PBUH) – Early Life – Prophethood– Teaching of Islam – Five Pillars of Islam – Qur'an and Hadith

**UNIT - III**

The Pious Caliphate – Hazrat Abu Bakr, Hazrat Umar, Hazrat Uthman and Hazrat Ali – Administration under the Pious Caliphate

**UNIT - IV**

The Umayyad Dynasty –Muawiyah I – Yazid I – Abdul Malik – Al-Walid I – Umar bin Abdul Aziz – Fall of the Umayyads.

**UNIT - V**

Cultural Progress under the Umayyad – Literature – Art and Architecture

**Text Books**


1. Abbas Ali: Civilization in Islam, Reference Press, New Delhi, 2005.
2. Ameer Ali, Syed: The Spirit of Islam, Idarahi-i-Adabiyat-i-Delhi, New Delhi, 1997.
3. Ameer Ali, Syed: History of the Saracens, Kitab Bhavan, New Delhi, 1995.


**Books for Reference**


1. Arnold, Thomas: The Legacy of Islam, Oxford University Press, 1980.

2. Hitti,Philip.K: History of Arabs, Macmillan India, New Delhi, 1974.
3. Zaydan,Juriji: History of Islamic Civilization, Kitab Bhawan, New Delhi, 1978

**V SEMESTER** **CORE PAPER X**

## HISTORY OF THE USA FROM COLONIZATION TO 1865 A.D.

**(Hrs/Week: 5, Code: U3HI5002, Credit: 4)**

**Objectives**

To study the colonization of America
To impart the significance of American Revolution
To know the development of American Republic
To highlight on the Policy of Isolation
To inform the significance of Civil War

**UNIT - I**

English Colonization of America – Thirteen Colonies – Red Indians – American War of Independence – Causes and course of the Revolution – The Treaty of Paris 1783 – Confederation – The Constitutional Convention.

**UNIT - II**

Federalist and Republicans –George Washington – John Adams – Republican Revolution – Administration of Jefferson

**UNIT - III**

Grievances of the Indians – Tecumseh Missions – The War of 1812 – Treaty of Ghent 1814– Monroe Doctrine – Jackson and his Democracy

**UNIT - IV**

Territorial Expansion –Louisiana Purchase – Acquisition of Florida – Manifest Destiny – Colonization of Texas and Oregon – President Polk and Manifest Destiny – The Mexican War.

**UNIT - V**

Issue of Slavery – Abraham Lincoln – The Civil War – Causes, Course and Results of the Civil War

**Text Books**

1. Dharmaraj, J.C: History of the USA (1800 - 2002), Denshi Publication, Sivakasi, 2001.
2. Krishnamurthi: History of the United States of America, 1492-1965, Madurai Printers, Madurai, 1980

3. Nambi Arooran, A.: History of the USA (Tamil), Tamil Nadu Text Book Society Publication, Chennai, 1980
4. Rajayyan, K.: A History of the USA, Madurai Publishing House, Madurai, 1978.
5. Parkes, H.B.: The United States of America - A History, Scientific Book Agency, Calcutta, 1975

**Books for Reference**

1. Beard and Beard: New Basic History of the United States, New York, USA, 1985.
2. Majumdar, R.K. &Srivastva, A.N: History of the United States of America – From 1845 to Present Day, SBD Publishers and Distributors, New Delhi, 1998
3. Marshall Smelsor: American History - At A Glance, Barnes and Noble, INC, New York, 1962

**V SEMESTER** **CORE PAPER XI**

## HISTORY OF EUROPE FROM 1453 TO 1789 AD

**(Hrs/Week: 6, Code: U3HI5003, Credit: 5)**

**Objectives**

To know the importance of Renaissance
To highlight on the significance of Reformation
To study about the rise of Nationalism
To inform about the Benevolent Despots
To learn the impact of French Revolution

**UNIT - I**

Geographical Discoveries – Renaissance in Italy, England, Spain and France – Impact on Art, Architecture, Literature and Science

**UNIT - II**

Reformation in Germany, England, France and Switzerland – Counter Reformation

**UNIT - III**

Rise of Nation States – Nationalism – Thirty Years War

**UNIT - IV**

Age of Benevolent Despotism – Louis XIV of France – Frederick II of Prussia – Joseph II of Austria – Peter the Great and Catherine of Russia

**UNIT - V**

Louis XV and Louis XVI – Ancient Regime – France on the eve of French Revolution

**Text Books**

1. Meena M.: The Pelican History of Medieval Europe
2. C.J.H. Hayes: Modern Europe

**Books for Reference**

1. H.A.L. Fischer: History of Europe
2. Hayes Baldwin Cole: History of Western Civilization up to 1508 AD
3. Gordon Junior: History of Europe

**V SEMESTER** **CORE PAPER XII**

## HISTORY OF JAPAN FROM 1853 TO 2000 AD

**(Hrs/Week: 5, Code: U3HI5004, Credit: 4)**

**Objectives**

To study the Arrival of Europeans
To know about the Modernization of Japan
To highlight the role of Japan in World Wars
To learn the transformation and reconstruction of Japan
To introduce about the foreign policy of Japan

**UNIT - I**

Japan in the 19th Century – Arrival of Europeans – Fall of Tokugawa Shoguns – Perry Mission – Treaty of Kanagawa and Harris Treaty.

**UNIT - II**

Meiji Restoration – Modernization of Japan – Rise of Political Parties – Sino-Japanese War of 1895 – Russo-Japanese War

**UNIT - III**

Japan and First World War – Twenty one demands – Washington Conference – Manchurian Crisis – Rise of Militarism - Second World War and Japan.

**UNIT - IV**

Japan under occupation – Mac Arthur and New Constitution – political, social and economic reforms – Industrial growth – Japan as economic Super Power

**UNIT - V**

Post war politics – Foreign policy of Japan – Japan and ASEAN – Japan and UNO – Relations with China.

**Tetxt Books**

1. S.L. Roy: A Short History of the Far East
2. Lav Furathe: The Far East
3. Michael and Taylor: The Far East in Modern Times

**Books for Reference**

1. Fairbank, Reichaeur and Craig, East Asia: The Modern Transformation, London, 1969
2. Harold Hakwon Sunoo: Japanese Militarism - Past and Present, Chicago, 1975

**V SEMESTER** **ELECTIVE PAPER I**

## CONSTITUTIONAL HISTORY OF INDIA

**(Hrs/Week: 5, Code: U3HIE501, Credit: 4)**

**Objectives**

To understand the evolution of Constitutional Development
To discuss the development of different branches of Government
To comprehend the significance of Government of India Acts
To know the impact of Constitutional Developments and Independence
To study the significance of Indian Constitution

**UNIT - I**

Introduction – Government of India Act of 1858 – Indian Councils Act of 1861 – Indian Councils Act of 1892

**UNIT - II**

The Government of India Act of 1909 – The Government of India Act of 1919 – Diarchy in the Provinces

**UNIT - III**

Government of India Act of 1935 – Cripps Proposals – Wavell Plan

**UNIT - IV**

Mountbatten Plan – Indian Independence Act of 1947 – Cabinet Mission Plan

**UNIT - V**

Formation of the Constituent Assembly and its activities – Constitution of the Indian Republic – Salient features

**Text Books**

1. Aggarwal. R. C: Constitutional History of India and National Movement Chand & Company Ltd, Ram Nagar, New Delhi, 1998
2. Banerjee. A. C: Constitutional History of India, Macmillan Company of India Ltd, Meerut, 1978
3. Dr. Durga Das Basu: Introduction to the Constitution of India, Wadhwa& Company, Law Publishers, Agra, 2004
4. Grover, B.L.& Grover, S. :A New Look at Modern Indian History, 1707 – The Modern Times, S. Chand& Company Ltd, New Delhi, 1983

**Books for Reference:**

1. Dodwell: The Cambridge History of India, S. Chand & Company Ltd, Ram Nagar, New Delhi.
2. Desika Char, S.V.: Readings in the Constitutional History of India, 1757-1947, Oxford University Press, Oxford, 1983.
3. Sri Ram Sharma: Constitution, Orient Longman Ltd., New Delhi, 1974

**V SEMESTER** **SKILL BASED PAPER III**

## HISTORY OF SCIENCE & TECHNOLOGY FROM 1750 TO 1900 AD
**(Hrs/Week: 4, Code: U3HISB51, Credit: 3)**

**Objectives**

To study the development of Science and Technology
To brief about the different Organizations for Science and Technology
To highlight on the different areas of scientific development
To know about the different Scientists of the Period
To study the impact of Scientific Development

**UNIT - I**

Introduction – Impact of Indian Science –Introduction of Modern Sciences by the Europeans – Asiatic Society of Bengal – Zoological Survey – Botanical Survey – Geographical Survey – Trigonometrical Survey – Development of Meteorological and Astronomical Sciences

**UNIT - II**

Learned Institutes for Development of Science – Indian Association for the Cultivation of Science – Indian Science Congress Association-Institution of Engineers – National Academy of Sciences – Indian National Science Academy

**UNIT – III**

Medical Education and Research – Technical Education and Research – Agricultural Education and Research – Veterinary Science – Agriculture and Irrigation – Food Crops – Commercial Crops – Plantation Crops – Engineering and Industry – Cottage Industry – Rural and Urban Arts and Crafts

**UNIT - IV**

Transport and Communication – Roads and Bridges – Harbours – Ports and Lighthouses – Waterways

**UNIT - V**

Great Scientists – Sawai Jai Singh – J.C.Bose- Srinivasa Ramanujam – Sir C. V. Raman – Role of Universities and Scientific Institutions

**Text Books**

1. Vadilal Dagil: Science and Technology in India.
2. Varghese Jeyaraj, S: History and Science and Technology, Anns Publications, Uthamapalayam, 2004
3. Venkatraman,R: History of Science and Technology, Ennes Publications, Madurai,1988.

**Books for Reference**

1. Gupta, S.P.: Science, Technology and Society in Modern Age.
2. Gupta,S.P.: Modern India and Progress in Science and Technology.
3. Kalpana Rajaram: Science and Technology in India.

**VI SEMESTER** **CORE PAPER XI**

## HISTORY OF THE ARABS FROM 750 TO 1258 AD

**(Hrs/Week: 5, Code: U3HI6001, Credit: 4)**

**Objectives**

To throw light on the Abbasid Revolution
To learn the significance of Crusades
To know the Contributions of Fatimids
To highlight on the Moors of Spain
To study the role of Arabs in the preservation and transformation of Knowledge

**UNIT - I**

Abbasid Revolution – Abul Abbas As-Saffah – Abu Jafer Al-Mansur – Harun Al-Rasheed – Mamun Al-Rasheed

**UNIT - II**

Al-Mutawakkil – Causes for the downfall of Abbasids – The Crusades – ImaduddinZengi – Sultan SalahuddinAyyubi

**UNIT - III**

The Fatimids of Egypt – Obaidullah Al-Mahdi – Al-Muiz – Al-Aziz – Cultural Contribution of the Fatimids – Downfall of the Fatimids

**UNIT - IV**

Moors of Spain – Abdul Rahman I – Abdul Rahman II – Abdul Rahman III – Development of Literature, Art and Architecture under the Moors

**UNIT - V**

Contribution of the Arabs to Science: Medicine, Astronomy, Mathematics, Chemistry and Ophthalmology – Famous Muslim Scientists and Historians

**Text Books**

1. Syed Mahmudun: Islam its concept and History, Kitab Bhavan, New Delhi, 1981
2. Khuda Baksh S.: The Orient under the Caliphs, Idarah-i-Adabiyat, New Delhi, 1893

3. Ali, Syed Ameer: The Spirit of Islam, Idarah-i-Adabiyat, Delli, New Delhi, 1997.

**Books for Reference**

1. Abbas Ali: Civilization of Islam, Reference Press, New Delhi, 2005.

2. Amir Ali, Syed: A Short History of the Saracens, Kitab Bhavan, New Delhi, 1995.

3. Arnold, Thomas: The Legacy of Isam, Oxford University Press, 1980.

**V SEMESTER** **CORE PAPER XIV**

## HISTORY OF U.S.A. FROM 1865 TO 2010 AD

**(Hrs/Week: 6, Code: U3HI6002, Credit: 5)**

**Objectives**

To explore the significance of American Reconstruction
To know the early 20th century developments
To inform about the Great Depression, Recovery and interference
To study about the involvement of America in Cold War
To understand the evolution of America as a Super Power

**UNIT - I**

Reconstruction – End of the Reconstruction – Rise of Big Business – Rail Roads – Growth of Industry – Labour Movement – Granger and Populist Movements – Growth of Imperialism – The Spanish-American War of 1898.

**UNIT - II**

Open Door Policy –Theodore Roosevelt – Progressive Reforms – Foreign Policy – W.H. Taft – Dollar Diplomacy – Woodrow Wilson – New Freedom- USA and the First World War – 14 Points – Treaty of Versailles.

**UNIT - III**

Warren Harding – Coolidge Prosperity – Hoover – Great Depression – Franklin D. Roosevelt – New Deal – Good Neighbour Policy – USA and Second World War

**UNIT - IV**

Domestic and Foreign Policy of Harry S. Truman – Cold War – D. Eisenhower – John F. Kennedy – Internal Policy – Foreign Policy – Civil Rights Movement – Martin Luther King.

**UNIT - V**

Lyndon B. Johnson – Richard Nixon – Gerald Ford – Jimmy Carter –Ronald Reagan – George Bush – Gulf War and Saddam Hussain – End of the Cold War – Bill Clinton.

**Text Books**

1. Beard and Beard: New basic History of the United States
2. Hill. C.P.: History of the United States, Edward Arnold, London, 1974.
3. Hofstadter: The American Republic, Vol 1, Up to 1865, Prentice – Hall Miller & Arooran. K Engle Wood Cliffs, New Jersey, 1959
4. Nambi Arooran. K.: History of United States of America (Tamil), Tamil Nadu Text Book Society, Government of Tamil Nadu, Chennai, 1975
5. Parkes H.B.: The United States of America – A History Khosla Publishing House, Delhi, 1986

**Books for Reference:**

1. Perry Miller: American Thought from the Civil War to the First World War.
2. Rajayyan. K.: A History of the United States, Madurai Publishing House, Madurai, 1978.
3. Somervell: History of the United States.
4. United States Information Agency: An outline of American History, 1994.

**VI SEMESTER** **CORE PAPER XV**

## HISTORY OF EUROPE FROM 1789 TO 1945 AD

**(Hrs/Week: 5, Code: U3HI6003, Credit: 4)**

**Objectives**

To estimate the significance of French Revolution
To know the importance of Napoleon Bonaparte
To study the administrative tactics of Napoleon Bonaparte
To highlight the nation building efforts
To inform the 20th century developments in Europe

**UNIT - I**

French Revolution of 1789 – Causes, course and results of the French Revolution – French Philosophers.

**UNIT - II**

Napoleon Bonaparte – Conquests – Civilian works – Continental system – Fall of Napoleon.

**UNIT - III**

France after 1815 – Congress of Vienna – Metternich – Concert of Europe – Holy Alliance – Revolution of 1830 and 1848

**UNIT - IV**

Unification of Germany – Unification of Italy – Second Republic – Napoleon III – Eastern question – Third French Republic

**UNIT - V**

First World War and Peace Treaties – League of Nations – Rise of Dictatorship – Mussolini – Hitler – Causes, course and results of the Second World War.

**Text Books**

1. B. V. Rao: History of Modern Europe [1789 - 1992], Sterling Publishers Pvt. Ltd., New Delhi -16.
2. C. D. M. Ketelby: A History of Modern Times from 1789, George G. Harappa & Co. Ltd, London, 1964

**Books for Reference:**

1. South Gate: Text Book of Modern European History
2. H.A.L. Fisher: From the beginning of the 18th Century A.D. to 1935 A.D., Vol.-II, Surjeet Publications, Delhi - 1987

**VI SEMESTER** **CORE PAPER XVI**

## HISTORY OF CHINA FROM 1900 TO 2000 AD

**(Hrs/Week: 5, Code: U3HI6004, Credit: 4)**

**Objectives**

To know the significance of Manchu rulers

To highlight on the role of Dr. Sun-Yat- Sen

To discuss the role of Chiang Kai Shek in the development of China

To Study the importance of Mao-Tse-Tung

To Understand the Post Mao Era

**UNIT - I**

China under the Manchus –Boxer Rebellion – Manchu Reforms – Revolution of 1911 – Decline of Manchus

**UNIT - II**

Dr. Sun-Yat-Sen – Yuan-Shi-Kai – China and the First World War – May 4th Movement – Washington Conference.

**UNIT - III**

Rise of Kuomintang Party – Chiang-Kai-Sheik – Birth of Communism in China – Civil War in China – Manchurian Crisis –Second Sino-Japanese War.

**UNIT - IV**

Mao's Era – Establishment of Peoples Republic of China – Cultural Revolution – China Since Cultural Revolution – Estimate of Mao.

**UNIT - V**

Post Mao Era in China – Hua-Gua-Feng – Deng Xiaoping – Jiang Zemin – China in the World Affairs.

**Text Books**

1. Ahamed L.L.: A Comprehensive History of the Far East, S. Chand and Co., Ltd., New Delhi, 1981
2. David M.D.: The Making of Modern China. Himalaya Publishing House, Bombay, 1993
3. Paul. H. Clyde & Burton F. Beers: The Far East - A History of Western Impacts and Eastern Responses 1830 - 1975. Prentice Hall of India (P) Ltd, New Delhi, 1988

**Books For Reference**

1. Ross Terrill: The Future of China after Mao, Clarion Books, Delhi, 1978
2. Sukaiming Modern China - A Topical History, New World Press, Beijing, China, 1986
3. Vinacke. H.M.A History of The Far East in Modern Times. Kalyani Publishers, New Delhi, 1989

**VI SEMESTER** **ELECTIVE II**

## INDIA AND HER NEIGHBOURS FROM 1947 TO 2000 AD

**(Hrs/Week: 5, Code: U3HIE601, Credit: 5)**

**Objectives**

To understand the dynamics of Indo-Pak relations
To learn the developments in Indo-China relations
To discuss the Indo Bangladesh and Indo-Nepal relations
To highlight on the Indo-Sri Lankan relations
To study the role of India in Regional Organizations

**UNIT - I**

India and Pakistan: Kashmir Conflict – Indus Treaty – 1965 and 1971 War and Shimla Agreement – Agra Summit.

**UNIT - II**

India and China: Panch Sheel Agreement – Tibet, Dalai Lama and Border Dispute – 1962 War and frozen relations – Rajiv Gandhi's visit to China – Improvement in bilateral relations – Areas of Concern

**UNIT - III**

India and Bangladesh: Early relations under Mujibur Rahman – Farakka Water dispute and settlement – Chakma Refugees – Border dispute redressal – Indo-Nepal Relations – Trade and Transit Treaty – India's Security Concerns

**UNIT - IV**

Indian and Sri Lanka: Shastri-Srimavo Pact of 1964 – Katchativu Settlement – Eelam question and Indian response – IPKF and its impact – India and Maldives – Indo-Bhutanese relations

**UNIT – V**

India and Non-Alignment Movement – SAARC – Indian Ocean as a zone of Peace

**Text Books**

1. A. Appadorai, The Domestic Roots of India's Foreign Policy, Oxford University Press, Delhi, 1981
2. Hall D.G.E.: History of South East Asia
3. Rao B. V. History of Modern Asia, Sterling Publishers Pvt. Ltd., New Delhi

**Books for Reference:**

1. Palanithurai G. & Mohanasundaram K.: Dynamics of Tamil Nadu Politics in Sri Lankan Ethnicity (New Delhi: Northern Book Centre, 1993)
2. Dixit J. N.: India's Foreign Policy and its Neighbours, Gyan Publishing House, New Delhi, 2001

**VI SEMESTER** **SKILL BASED SUBJECT IV**

## HISTORY OF SCIENCE AND TECHNOLOGY FROM 1900 TO 2000 AD

**(Hrs/Week: 4, Code: U3HISB61, Credit: 3)**

**Objectives**

To understand the evolution of Indian Science in British Period
To study the significance of Agricultural development in India
To discuss about the study of Energy Production
To highlight on the developments in Transport and Communication
To learn the advancement in Industrial Growth

**UNIT - I**

Contribution of Europeans to Indian Science: Government policies after Independence – Establishment of Scientific Institutions after Independence – Prominent Indian Scientist since Independence.

**UNIT - II**

Agriculture: Agricultural Education and Research – Veterinary Science – Green and White Revolution – Irrigation Projects and Water Management – Live Stock and

Fisheries – Promotion of Agriculture since Independence – Problems faced by Farmers and Farming Sector

**UNIT - III**

Energy: Various forms of Energy – Energy Production Projects during the British period – Organizations monitoring and distributing Power – Atomic Power Stations in Independent India – Advantages and Disadvantages of Atomic Power – Hydro Electric Projects in Independent India – Thermal Power Stations – Alternative Power Resources and their Utilization – Energy Sufficiency and Management

**UNIT - IV**

Transport and Communication: Railways, Roadways, Airways and Shipping –National and State Highways – International and Domestic transport – Harbours – Aeronautical Industries – Space Research Organization – Satellites – Insat System – Launch Vehicle Technology – Telecommunications – Comparative Assessment of growth with other countries.

**UNIT - V**

Industries – Small Scale and Cottage Industries – Handloom and Textile Industry – Iron and Steel –Software and Information Technology – Pharmaceutical Industries – Assessment of Industrial growth – Brain Drain – Efforts for Science to masses.

**Text Books**

1. Gupta S. P.: Modern India and Progress in Science and Technology
2. Kupram and Kumudamani: History of Science and Technology, XII Vols.
3. Jeggi O.P.: History of Science and Technology

**Books for Reference:**

1. Kalpana Rajaram: Science and Technology in India, New Delhi, 1993.
2. Venkatraman R.: History of Science and Technology, Madurai, 1988.
3. Varghese Jayaraj: History of Science and Technology, Uthamapalayam, 1997.

# *DEPARTMENT OF BUSINESS ADMINISTRATION*

**V Semester**
**Human Resource Management**

**U3BA5001**

**Core Subject** **5 Hours per week** **4 Credits**

**Unit I**

Meaning, Nature and scope of HRM – Difference between Personnel Management and HRM – Functions of HRM – Environment of HRM – Strategic HRM.

**Unit II**

Human Resource Planning – Recruitment – Sources of Recruitment – Selection – Methods of Selection – Application of various Tests – Interview techniques in selection – Placement-Job Analysis ,Job Description and job specification.

**Unit III**

Induction –Meaning of Training and Development - Training Methods – Techniques – Identification of Training needs.

**Unit IV**

Performance Appraisal – Need for Appraisal – Methods – Job Evaluation –Wages and Salary Administration-Objectives-Time rate and Unit rate-Incentive methods of wage payment-Permissible additions and deductions in wage and salary-Provisions of payment of wages Act, 1932.

**Unit V**

Transfer – Promotion and termination of services – Career development – Mentoring – HRM Audit – Nature – Benefits – Scope –Approaches.

**TEXT BOOKS:**

**1.**Aswathappa : Human Resource and Personnel Management
2.J Jayasankar : Human Resource Management
3.Subba Rao P : HRM and Industrial Relations

**REFERENCE BOOKS:**

1.Memoria C B : Personnel Management
2.Gary Dessier : Human Resource Management
3.Dwivedi R S : Human Relations and Organization Behavior
4.Beard well and Holden : Human Resource Management

**V semester**

**Business Law** **U3BA5002**

**Core Subject** **5 Hours per week** **4 Credits**

**Unit I:**

Business Law-Introduction and meaning-Law of Contract (General Contract only)-Kinds of Contract-Elements of Valid Contract-Offer-Tenders-Special terms in Contract-Acceptance.

**Unit II:**

Consideration-Stranger to Contract -Contracts without Consideration-Contractual Capacity-Free Consent-Coercion, Undue Influence, Misrepresentation and Fraud, Mistake.

**Unit III:**

Legality of Object- Void Agreements -Contingent Contracts -Performance of Contract-Discharge and Breach of Contract- Quasi Contract.

**Unit IV:**

Special Contracts- Bailment and Pledge- Lien- Hypothecation charge- Mortgage.

**Unit V:**

Sale of Goods Act- Sale and Agreement to Sell - Conditions and Warranties- Transfer of Property- Performance- Unpaid Seller- Rights.

**TEXT BOOKS:**

1.Kapoor N D : Business Law
2.Shukla : Business Law
3.R S N Pillai & Bagavathi : Business Law

**REFERENCE BOOKS:**

1. P C Tulsian : Business Law
2. Sreenivasan M R : Business Law
3. Pathak : Legal aspects of Business

**V semester**

**Marketing Management U3BA5003**

**Core Subject 5 Hours per week 4 Credits**

**Unit I**

Fundamentals of Marketing – Role of Marketing- Relationship of Marketing with other functional areas- Concept of Marketing Mix- Marketing approaches- Various Environmental factors affecting the marketing functions.

**Unit II**

Buyer Behavior- Buying motives- Buyer Behavior Model- Factors influencing buyer behavior.

Market segmentation- Need and basis of segmentation- Marketing Strategy.

**Unit III**

Sales Forecasting- various methods of Sales Forecasting- The Product- Characteristics- Classification- Consumer goods- Industrial goods-New product development-process- Product Life Cycle- Product line and product mix decisions- Branding- Packaging.

**Unit IV**

Pricing- Factors influencing pricing decisions – Pricing objectives – Pricing policies – Pricing strategies .

**Unit V**

Channels of Distribution – Definition-Importance- Types-Factors considered in selecting channels –Classification of middle men –Wholesaler-Definition-Functions- Retailer- Definition-Functions of Retailers .

**TEXT BOOKS:**

1.Rajan Nair :Marketing

2.J. Jayasankar :Marketing

**REFERENCE BOOKS:**

1.Philip Kotler & Armstrong :Marketing Management

2.Saxena : Marketing Management

3.Ramaswamy and Namakumari : Marketing Management

4.Varshney and Gupta S L : Marketing Management

**V semester**

**Cost Accounting** **U3BA5004**

**Core Subject** **5 Hours per week** **4 Credits**

**Unit I**

Cost Accounting – Meaning, Definition and objectives – advantages of cost accounting – Distinction between cost and financial accounting – cost classification – Elements of Cost.

**Unit II**

Cost Sheet-Meaning –Objectives-Specimen of Cost Sheet-Preparation of Cost Sheet-Tenders and Quotations .

**Unit III**

Material – Purchase, receipts and inspection – Store records – Bin Card – Store Ledger – Methods of pricing material issues (FIFO, LIFO, simple average, weighted average only) – Inventory Control – EOQ –Maximum, Minimum and Re-ordering Level.

**Unit IV**

Labor – Importance of Labor Cost Control – Methods of Wage Payments – Incentive Plan (Halsey, Rowan, Taylor's, merrick's, Gantt's task plan only)

**Unit V**

Overhead – Meaning and classification of overhead – allocation and apportionment of overhead.-Primary Distribution of overhead-Secondary distribution of overhead(Repeated Distribution Method).

**Note: 80% problems and 20% theory**.

*(Only simple problems should be asked)*

**TEXT BOOKS:**

1.Jain and Narang :Cost Accounting
2.Reddy T S &Hari Prasad Reddy :Cost Accounting
3.Pillai & Baghavathy :Cost Accounting

**REFERENCE BOOKS:**

1.S P Iyangar : Cost Accounting
2.S N Maheswari : Principles of Cost Accounting

**V semester**
**Elective Paper I**
**Entrepreneurial Development U3BAE501**

**Elective Subject** **6 Hours per week** **5 Credits**

**Unit I**

Introduction – Understanding the meaning of Entrepreneurial ship – Characteristics of an Entrepreneur – Classification of the Entrepreneurs – Entrepreneurial Scene in India – Factors influencing Entrepreneurship.

**Unit II**

Entrepreneurial growth – Role played by government and Non- Government agencies – EDP's, TIIC, SIDBI, PIPDIC, IDBI, IFCI, ETC.

Problems and prospects of Women Entrepreneurs – Rural Entrepreneurs – Small Scale Entrepreneurs.

**Unit III**

Criteria for market selection -Business Idea generation Techniques – Identification of Business Opportunities – Marketing Feasibility – Financial Feasibility – Technical Feasibility – Legal Feasibility – Managerial and Location Feasibility.

**Unit IV**

Project Appraisal – Methods – Techniques – Preparation of Business Plan – Content of a Business Plan – Project Report.

**Unit V**

Procedure for starting an enterprise – Factors involved in selecting New Unit-Franchising and Acquisition.

How to be a successful Entrepreneur? - Learning to be successful entrepreneurs.

**TEXT BOOKS**:

1.Jayshree Suresh : Entrepreneurial Development
2.Khanka : Entrepreneurial Development

**REFERENCE BOOKS**:

1.Gupta C B : Entrepreneurial Development
2.Saini : Entrepreneurship-Theory and Practice

**V semester**

## Skill Based Paper

**EXPORT MANAGEMENT** **U3BASB51**

**Skill Based Subject** **4 Hours per week** **3 Credits**

**Unit I**

Export Management – Meaning and Definition – Objectives of Export –Features – Barriers in Export.

**Unit II**

Export Incentives –Duty Entitlement Pass Book Scheme- Duty Exemption Entitlement – Export Promotion Capital Goods Scheme –Export Oriented Units-Export Houses – Trading Houses- Star Trading Houses.

**Unit III**

Export Finance – Pre-shipment Finance –Post-shipment Finance- Role of EXIM Bank and Export Credit Guarantee Corporation.

**Unit IV**

Export Procedures (Customs formalities and Shipping).

Documentation (Pro forma Invoice ,Commercial Invoice ,GR 1 Form ,Letter of Credit ,Bills Receivables ,Shipping Bill ,Shipping Order ,Vehicle Ticket, Bill of Lading, Mate Receipt, Airway Bill.

Terms of Payment (FOB, FOA,C&F,CIF,D/A,D/P).

**Unit V**

Government Institutions assisting in promoting export (Ministry of Commerce, Directorate General Of Foreign Trade- Export Promotion Council- Indian Institute of Foreign Trade –India Trade Promotion Organization-Federation of Indian Export Organization only)

**TEXT BOOKS:**

1.P.R.Khurana-Export Management –Galgotia Publishing House, Delhi
2.Balagopal –Export Management.

**REFERENCE BOOKS:**

1.Francis Cheruvilam-Himalaya Publishing House.
2.D.C .Kapoor –Export Management-Vikas Publishing House

**VI Semester**

**Industrial Relations** **U3BA6001**

**Core Subject** **6 Hours per week** **4 Credits**

**Unit I**

Industrial Relations –Meaning – Nature and Scope of Industrial Relations – Importance – Trade Unions –Objectives and Functions of Trade Union – Procedure for Registration – Rights of registered Trade Union – Causes for failure of Trade Unions in India.

**Unit II**

Industrial Disputes – Definition – Meaning – Machineries available under Industrial Dispute Act for the prevention and settlement of Industrial disputes – Causes for Industrial Dispute – Industrial Unrest – Employee Dissatisfaction – Disciplinary Action – Strikes – lockout – Legal and illegal – Prevention of Strikes and Lockouts.

**Unit II**

Participative Management –Objectives-Scope – Structure – Collective Bargaining – Works Committee – Joint Management Council– Appointment of worker as board of director-Workers as shareholders- Role of Government in Collective Bargaining.

**Unit IV**

Indian Factories Act, 1948 – Objectives –Provisions of the Act regarding Welfare, Health and Safety of Workers.

**Unit V**

Workmen's Compensation Act –Objectives-Disablement-Meaning-Temporary total and partial disablement-Permanent total and partial disablement –Determination of compensation International Labor Organization – Role and Functions.

**TEXT BOOKS:**

1.Sreenivasan M R :Industrial Relations and Labor legislations
2.Aswathappa : Human Resources and Personnel Management

**REFERENCE BOOKS:**

1.Subba Rao :HRM and Industrial Relations
2.Monoppa : Industrial Relations

**VI Semester**

**ADVERTISING AND SALESMANSHIP U3BA6002**

**Core Subject 6 Hours per week 4 Credits**

**Unit I**

Advertising- Meaning and Definition-Publicity Vs Advertising-Objectives- Benefits of Advertising to Manufacturers, Customers, Middlemen and Sales force- Arguments against Advertising.

**Unit II**

Kinds of Advertising - Advertisement Copy - Qualities of a good Advertisement Copy – Advertising Budget.

**Unit III**

Advertisement Media – Print Media, Broad cast Media and other Media – Factors influencing in the selection of Media –Measuring the advertisement effectiveness.

**Unit IV**

Salesmanship – Meaning and Definition –Salesmanship Vs Advertising –Process of Selling – Kinds of salesmen.

**Unit V**

Qualities of a good salesman - Training and supervising the salesman – Remunerating salesman – Motivating the salesman.

**TEXT BOOKS:**

1.Dawar S.R : Salesmanship and Advertisement
2.R.Thirunavukkarasu & Dr.L.P. Ramalingam :Marketing Management
3.Dr. C.B.Gupta & Dr.N.Rajan Nair : Marketing Management
4.Dr.N. Rajan Nair & Sanjith R.Nair :Marketing
5.Saravanavel & Sumathi : Advertising& Sales Promotion,

**REFERENCE BOOKS:**

1.Wells, Moriarty & Burnett : Advertising, Principles & Practices
2.S. H. H. Kazmi and Satish K Batra : Advertising & Sales Promotion
3.George E Belch and Michel A Belch, Advertising & Promotion,

**VI Semester**

**Elective Paper II**

**Computer Application in Business** **U3BA6003**

**Elective Subject** **5 Hours per week** **4 Credits**

**Unit I**

Information Technology Basics – Information definition – Prerequisite of information – need for information – components of information Technology – Role of Information Technology in Business.

**Unit II**

Word processing with MS Word- starting MS word – MS word environment – working with word documents – working with text – working with tables – checking spelling and grammar – printing a document.

**Unit III**

Spreadsheets and MS Excel : Starting MS Excel – MS Excel environment – working with Excel workbook – working with worksheet – Formulas and Functions – Inserting Charts – printing in Excel.

**Unit IV**

Making presentation with MS power point: Starting MS power point – MS power point environment – working with power point – working with different views – designing presentation – printing in power point.

**Unit V**

Electronic Commerce – Types – Advantages and disadvantages – Electronic data interchange (EDI) – How EDI works – EDI benefits – EDI limitations – SMART card – SMART card applications.

**TEXT BOOKS:**

1.Ananthi sheshasaayee : Computer Application in Business and Management

2.A.Zakiudeen Ahmed : Computer Application in Business

**REFERENCE BOOKS:**

1..Stephen : Computer Application

**VI Semester**
**Skill based Paper**
**Company Law** **U3BASB61**

**Skill Based Subject** **3 Hours per week** **3 Credits**

**Unit I**

Company – Definition-Characteristics of a company- Types of Company-Private Limited and Public limited Company –Distinctions between private and public company- Holding and Subsidiary company –Government and foreign company.

**Unit II**

Articles of Association – Meanings and Contents of Articles of Association - Memorandum of Association –Meaning –Content of Memorandum of Association- Prospectus –Meaning and contents of Prospectus- Statement in Lieu of Prospectus

**Unit III**

Share Capital – Types of Shares-Equity Shares-Preference Shares-Types of Preference Shares-Debentures-Types of Debentures-Management of company-Powers of Directors and Managing Director.

**Unit IV**

Company Meetings – Types of Meeting- Statutory, Annual General Body, Extraordinary General Body Meeting-Requisites of a valid meeting

**Unit V**

Winding up of companies – Meaning – Modes of Winding up of a Company-Compulsory winding up under order of Court-Grounds for Compulsory winding up-voluntary winding up of company-Types of voluntary winding up.

**TEXT BOOKS:**

1. Kapoor N D : Company law
2. Shukla : Company law
3. R S N Pillai & Bagavathi : Company law

**REFERENCE BOOKS:**

1. Dr. M R Sreenivasan : Company Law
2. P C Tulsian : Company law
3. Pathak : Legal aspects of Business

**VI Semester**

**GROUP PROJECT** **U3BAGP06**

**Core Subject** **6 Hours per week** **10Credits**

A group of not exceeding 5 students will be sent for training in business establishments for 30 days and assigned a project in the beginning of the sixth semester. The Project Report shall be submitted to the college before the end of the sixth semester.

The Project Report shall be evaluated externally. Project Report shall carry 75 marks and for viva voce-exam 25 marks.

Those who fail in the Project work will have to re –do the project work & submit to the college for evaluation.

The External Examiner shall be from the panel of examiners suggested by the Board of Studies.

**VI Semester**

**COMPUTER APPLICATON IN BUSINESS**
**MS OFFICE (PRACTICALS) U3BAPR61**

| | | |
|---|---|---|
| **Core Practical** | **4 Hours per week** | **3 Credits** |

**Objective:**

- To give knowledge of MS-Office to the students so that the students can prepare test documents and Excel sheets and to prepare ppt's for presentation.

**(A) MS-WORD**

1. Usage of Numbering, Bullets, Tools and Headers
2. Usage of Spell Check and Find and Replace
3. Text Formatting
4. Picture Insertion and Alignment
5. Mail Merge Concept
6. Creation of Tables, Formatting Tables
7. Splitting the Screen
8. Inserting Symbols in Documents

**(B) MS-EXCEL**

1. Changing of Column Width and Row Height (Column and Range of Column)
2. Moving, copying, Inserting and Deleting Rows and Columns
3. Creating Chart.
4. Using Excel Function (Date, Time)
5. Using Excel Function (Statistical Mathematics)
6. Using Excel Function (Financial)

**(C) MS-POWER POINT**

Working with Slides

1. Creating, saving, Running Slides
2. Adding Headers and footers
3. Changing slide layout
4. Working fonts and bullets
5. Inserting Clipart

## *DEPARTMENT OF COMMERCE [FINANCE &ACCOUNTS]*

**CORE PAPER XIII**
**ISLAMIC BANKING & FINANCE– I**
**(Subject Code: U3FA5001)**

**Semester: V** **Hours: 5**
**Max. Marks: 75** **Credits: 4**

**Objectives:** Islamic Banking introduces the idea of banking operation based on the Islamic Principle of Partnership and Profit sharing, for free of interest – The aim of subject to suggest a number of innovative proposals to provide interest free finance for development. It shows how Islamic Bank can play an active role in improving the rural and urban poor.

**Unit – I:** Evolution of Islamic Banking - Ancient Banking - Banking in Early Islam - What is Interest/Usury? - A brief history of Interest/Usury in Europe.

**Unit – II:** Usury/Interest in Islam - Interest from Loan Vs Profit from Trade - The Impact of Western Colonization - Emergence of Islamic Banking - Islamic Banking and Mit-Ghamr: The Pioneering Experiment.

**Unit – III:** The Unique Financial Institution: Tabung Haji - The Rise of Islamic Banks - Islamic Banking in Malaysia.

**Unit – IV**: Islamic Financial system - The concept of Islamic Banking - Goals and Strategies of Islamic Banks.

**Unit – V:** Types of Contracts in Shari'ah - Stability of Islamic Banking System - Efficiency and Justice in Islamic Banking - Feasibility of Islamic Banking - The Role of Shari'ah Advisory Boards in Islamic banks.

**Reference Books:**


1. Khiyar Abdalla Khiyar, The Rise and Development of Interest Free Banking, Institute of Objectives Studies, New Delhi .
2. Dr.Nejatullah Siddiqui, Banking without Interest, Markazi Maktaba Islam, New Delhi.
3. Mohammad Nejathullah Siddiqui, Issues in Islamic Banking, The Islamic Foundation, London.
4. Mohammad Nejathullah Siddiqui, Muslim Economic Thinking, International Centre for Research in Islamic Economics, King Abdul Aziz University, Jeddah.
5. Mohammad Akram Khan, Rural Development through Islamic Books, The Islamic Foundation, London.

**Core Paper – XIV**

**COST ACCOUNTING - I**
**(Subject Code: U3FA5002)**

**Semester: V** **Hours: 6**
**Max. Marks: 75** **Credits: 4**

**Objective :** To gain knowledge of basic concepts and techniques of cost accounting.

**UNIT – I**

Introduction - Cost Accounting – Nature and Scope – Objectives, Advantages and Limitations – Financial Vs Cost Accounting – Cost Concepts and Classification- Elements of Cost - Cost Sheets and Quotation – Reconciliation of Cost and Financial Profits.

**UNIT – II**

Materials - Material Control – Inventory Control – ABC Technique – Levels of Stock and EOQ – Perpetual Inventory System.

**UNIT – III**

Pricing of Materials - Methods of Pricing of Material Issues - FIFO – LIFO – Simple and Weighted Average Method – Accounting for Material Losses.

**UNIT – IV**

Labour: Labour Turnover – Idle and Overtime – Remuneration and Incentives – Time Rate System – Piece Rate System – Taylor's, Merrick's Gantt's, Halsey and Rowan Plans – Calculation of Earning of Workers.

**UNIT – V**

Overhead - Classification of Overhead Costs – Allocation, Absorption and Apportionment of Overhead Cost – Primary and Secondary Distribution of Overheads – Computation of Machine Hour Rate and Labour Hour Rate.

**Note: Weightage of marks: Theory 20% and Problems 80%**

**Reference Books:**


1. S.P. Jain and Narang, Cost Accounting, Kalyani Publishers, New Delhi.
2. S.N. Maheshwari, Principles of Cost Accounting, Sultan Chand & Sons, New Delhi.

3. T.S.Reddy and Hari Prasad Reddy, Cost Accounting, Margham Publication, Chennai.
4. S.P. Iyengar, Cost Accounting, Sultan Chand & Sons, New Delhi.
5. P.C. Tulsian, Cost Accounting, Tata McGraw Hills, New Delhi.

## CORE PAPER XV
## HUMAN RESOURCE MANAGEMENT
## (Subject Code: U3FA5003)

**Semester: V** **Hours: 5**
**Max. Marks: 75** **Credits: 4**

**Objective:** To gain knowledge of basic concepts and techniques of HRM.

**UNIT – I**

Nature of Human Resources Management - Concept – Characteristics – Objectives – Importance – Functions and Scope.

**UNIT – II**

Acquiring Human Resource - Human Resource Planning – Objectives – Need and Importance – Job Analysis and Job design – Recruitment and Selection: Process of recruitment – Sources – Steps in selection process – Selection testing – Interviewing – Placement – Induction – Socialization.

**UNIT – III**

Developing Human Resources - Employee Training – Need – Importance – Types of Training – Objectives – Methods – Executive development: Objectives and importance – Methods and techniques.

**UNIT –IV**

Managing Performance and Compensation - Appraisal – Methods – Problems – establishing pay plans – Basics of Compensation – Factors determining the pay rate – Current trends in Compensation – Concept of profit sharing – Fringe benefits.

**UNIT – V**

Maintaining and Retaining of Human Resource - Concept of transfer – Promotion and Demotion – Absenteeism and Labour turnover – Causes or absenteeism – Effects of

absenteeism – Causes of labour turnover – Work Environment – Fatigue – Monotony and Boredom – Causes and Effects.

**Reference Books:**


1. Aswathappa, Human Resource and Personnel Management, TATA McGraw Hills, New Delhi.
2. Jayasankar, Human Resource Management, Margham Publications, Chennai
3. C B Gupta, Human Resource Management, Sultan Chand & Sons, New Delhi.
4. L M Prasaad, Human Resource Management, S Chand & Co., New Delhi.


## Core Paper – XVI

## PRACTICAL AUDITING
## (Subject Code: U3FA5004)

**Semester – V** **Hours: 5**

**Max. Marks: 75** **Credits:4**

**Objectives**: To gain basic knowledge of the principles and practice of auditing.

**UNIT-I**

Meaning and Definitions of Auditing – Objectives – Types – Advantages and Limitations – Qualities of an Auditor - Accountancy, Auditing and Investigation.

**UNIT –II**

Internal Control – Internal Check and Internal Audit – Audit Note Book – Working Papers – Vouching and Verification of Trading Transactions – Vouching of Impersonal Ledger.

**UNIT – III**

Verification and Valuations of Assets and Liabilities – Auditor's Position regarding the Valuation and Verification of Assets and Liabilities - Depreciation – Reserves and Provisions – Secret Reserves.

**UNIT – IV**

Company Audit – Qualifications and Disqualifications of Auditors Appointment and Removal – Right and Duties – Comptroller of Audit General – Appointments – Functions, Right and Duties – Branch, Joint and Special Audit – Audit Report – Types of Audit.

**UNIT –V**

Investigation – Objectives – Differences between Investigation and Auditing – Points to be noted while conducting an Investigation – Audit of Computerized Accounts – Electronic Audit.

**Reference Books:**


1. B.N. Tandon, Practical Auditing, S Chand & Co, New Delhi.
2. V.H. Kishadwala, Auditing Principles & Practices, Sultan Chand & Sons, New Delhi.

3. Kamal Gupta and Ashok Arora, Fundamentals of Auditing, TATA McGraw Hills, New Delhi.
4. F Clive de Paula, The Principles of Auditing, Pitman Publishing, London.

**Elective Paper - I**

## INCOME TAX LAW & PRACTICE – I
**(Subject Code: U3FAE501)**

**Semester – V** **Hours:6**
**Max. Marks: 75** **Credit:5**

**Objective:** To gain basics of income tax law and practical application like calculations and filing returns.

### UNIT – I

Basic Concepts – Assessment Year – Previous Year – Persons – Assessee – Income – Gross Total Income – Determination of Residential Status – Individual – HUF – Firm – Company – Relationship between Residential Status and Incidence of Tax.

### UNIT – II

Incomes exempt from Income Tax – Income under the head Salaries and its Computation – Characteristics of Salary Income – Different Forms of Allowances – Perquisites – Profits in Lieu of Salary – Deductions from Salary Income – Treatment of Provident Funds – Deduction under Section 80C.

### UNIT – III

Income under the head Income from House Property and its Computation – Basis of Charge – Exemption – Annual Value – Self-occupied and Let-out Properties – Partly Let-out and Partly Self-occupied – Deductions.

### UNIT - IV

Income from Business and Profession - Computation of Income under the head of Profits and Gains of Business or Profession – Basis of Charge – Basic Principles – Specific Deduction under the Act – General Deductions – Specific Disallowances – Deemed Profits.

### UNIT - V

Depreciation - Depreciation Allowance – Section 32 – Conditions for Claiming Depreciation – Block of Assets – Computation of Normal Depreciation Allowance – Additional Depreciation – Conditions and Rates of Depreciation – Meaning of Actual Cost – Unabsorbed Depreciation – Terminal Depreciation – Balancing Charge.

**Note: Weightage of marks: Theory 40% and Problems 60%**

**Reference Books:**


1. Gaur and Narang, Income Tax Law and Practice, Kalyani Publishers, New Delhi.
2. Vinod K Singhania and Monica Singhania, Students' Guide to Income Tax, Taxmann, New Delhi.
3. Mehrotra H C, Income Tax Law and Practice, Sahithya Bhavan, Agra.
4. Reddy T S and Hari Prasad Reddy, Income Tax: Theory, Law and Practice, Margham Publications, Chennai.
5. Dinkar Pagare, Income Tax Law and Practice, Sultan Chand & Sons, New Delhi.


## Skill Based Paper – III
## MANAGEMENT CONCEPTS
## (Subject Code:U3FASB51)

**Semester – V** **Hours: 3**

**Max. Marks: 75** **Credit: 3**

**Objective:** To gain knowledge of management concepts and its present development.

**Unit – I**

Management – Definition – Approaches to management – Scientific management F.W. Taylor (1865-1915) – Principle and Techniques of Scientific management – Peter F. Ducker's Contribution of management.

**Unit – II**

Social Responsibility – Concepts – Case – Scope – Social Responsibility of a business – Social Audit.

**Unit – III**

Management Information System (MIS) – Meaning – Information and Data – Importance's and Role of MIS – Information needs of management – Design of MIS – Essential of a sound MIS.

**Unit - IV**

Theories of Organisation – Classical organisational theory F.W. Taylor – Neo-Classical or Behavioural theory (Elton Mayo) – Modern Organization theory.

**Unit - V**

Theory of Motivation - Morale – Maslow's need for hierarchy theory – Meaning of Morale – Distinguish between motivation and morale – Significance of morale.

**Reference Books:**


1. Dr. C.B. Gupta, Business Management, Sultan Chand & Sons, New Delhi.
2. R.N. Gupta, Principles and Practice of Management, S Chand & Co., New Delhi.
3. Konntz, Weihrich and Aryasri, Principles of Management, TATA McGraw Hills, New Delhi.
4. Dr. H.C. Das Gupta, Principles and Practice of Management, Sahitya Bhavan, Agra.
5. Premavathi .N, Principles of Management, Sri Vishnu Publications, Chennai.


## CORE PAPER XVII
## ISLAMIC BANKING AND FINANCE – II
## (Subject Code:U3FA6001)

**Semester – VI** **Hours: 5**
**Max. Marks: 75** **Credit: 4**

**Unit – I**

Concept of Development - Economic Development - Historical Background of Economic development.

**Unit – II**

Economic Development in an Islamic perspective - Economic Development with justice - the role of Banking in Economic Development.

**Unit – III**

Contribution of Islamic Financial Techniques to Economic Development -Islamic Bank Bangladesh Limited (IBBL) and its Role in the Economic development of Bangladesh.

**Unit – IV**

Africa - Middle Eastern (Excluding G.C.C .Countries) - G.C.C. Countries.

**Unit – V**

South Asian Countries - Southeast Asian Countries - Europe and America.

**Reference Books**


1. Khiyar Abdalla Khiyar, The Rise and Development of Interest Free Banking, Institute of Objectives Studies, New Delhi .
2. Dr.Nejatullah Siddiqui, Banking without Interest, Markazi Maktaba Islam, New Delhi.
3. Mohammad Nejathullah Siddiqui, Issues in Islamic Banking, The Islamic Foundation, London.
4. Mohammad Nejathullah Siddiqui, Muslim Economic Thinking, International Centre for Research in Islamic Economics, King Abdul Aziz University, Jeddah.
5. Mohammad Akram Khan, Rural Development through Islamic Books, The Islamic Foundation, London.

**Core Paper – XVIII**
**COST ACCOUNTING - II**
**(Subject Code: U3FA6002)**

**Semester: VI** **Hours: 6**
**Max. Marks: 75** **Credits: 4**

**Objective :** To gain knowledge of basic concepts and techniques of cost accounting.

**UNIT – I**

Job, Batch, Contract Costing: Job Costing – Definition and Features – Procedure – WIP – Cost Accumulation. Batch Costing – EBQ. Contract Costing – Definition – Features – Work Certified and Uncertified – Incomplete Contract – Escalation Clause – Cost Plus Contract and Contract Account.

**UNIT – II**

Process Costing – Definition and Features – Job vs. Process Costing – Normal Loss and Abnormal Loss – Abnormal Gain – Bye Product and Joint Products – Equivalent Production - Process Accounts.

**UNIT – III**

Operating or Service Costing: Operating Cost Units – Operating Costing in some Service Industries – Transport Costing – Advantages of Operating Costing in Transport Organization – Costing Procedure in Transport Organization – Costing for Hotels, Hospitals & Cinema Houses.

**UNIT – IV**

Marginal Costing: Definition – Advantages and Limitation – Cost-Volume-Profit Analysis – Contribution – Break Even Analysis and Break Even Point – Margin of Safety – Key Factor – Selection of Product Mix – Changes in Selling Price – Desired Level of Profit.

**UNIT – V**

Variance Analysis - Standard Costing: Meaning – Advantages and Limitations – Analysis of Variances – Material Cost Variance, –Labour Cost Variance and Overhead Variance. (Simple Problem Only)

**Note: Weightage of marks: Theory 20% and Problems 80%**

**Reference Books:**

1. S.P. Jain and Narang, Cost Accounting, Kalyani Publishers, New Delhi.

2. S.N. Maheshwari, Principles of Cost Accounting, Sultan Chand & Sons, New Delhi.
3. T.S.Reddy and Hari Prasad Reddy, Cost Accounting, Margham Publication, Chennai.
4. S.P. Iyengar, Cost Accounting, Sultan Chand & Sons, New Delhi.
5. P.C. Tulsian, Cost Accounting, Tata McGraw Hills, New Delhi.

## Core paper - XIX
## MANAGEMENT ACCOUNTING
## (Subject Code: U3FA6003)

**Semester: VI** **Hours: 5**
**Max. Marks: 75** **Credits: 5**

**Objective :** To gain knowledge of basic concepts and techniques of management accounting.

**Unit – I**

Introduction - Management Accounting – Meaning – Definition - Objectives – Nature & Scope – Advantages & Limitations – Management Accounting vs. Financial Accounting – Management Accountings vs. Cost Accounting – Financial statement analysis – Comparative and common size statements – Trend analysis.

**Unit – II**

Ratio Analysis-Meanings, Significance, Advantages and Limitations - Analysis and Interpretation of Financial Statements – Basic purpose of various ratios – Liquidity Ratio – Solvent Ratio - Profitability Ratio - Turnover Ratio – Financial Ratio.

**Unit – III**

Funds Flow Statement – Meaning - Need – Advantages and Limitations – Statement of Changes in Working Capital – Calculation of Funds from Operation – Preparation of Funds Flow Statement. Cash Flow Statement – Meaning - Objectives and Scope – Funds Flow Statement Vs Cash Flow Statement – Preparation of Cash Flow Statement as per AS – 3.

**Unit – IV**

Budget and Budgetary Control – Objectives - Advantages and Limitations – Classification of Budgets – Zero Based Budget – Preparation of Sales Budget – Production Budget – Cash Budget – Flexible Budget.

**Unit – V**

Capital Budgeting – Meaning – Significance – Methods of Evaluation of Capital Expenditure – Pay Back Period, Discounted cash flow, Internal rate of Return Method and Accounting Rate of Return Method.

**Note: Weightage of Marks – Theory 20% Problem 80%**

**Reference Books:**

1. I M Pandey, Management Accounting, Vikas Publishing House, New Delhi.
2. S N. Maheswari, Management Accounting, Sultan Chand & Sons, New Delhi.
3. Khan and Jain, Management Accounting, Tata McGraw Hill, New Delhi.

4. Sharma & Sasi K. Gupta, Management Accounting, Kalyani Publications, New Delhi.
5. T.S.Reddy & Y. Hari Prasad Reddy, Management Accounting, Margham Publications, Chennai.

**Core paper - XX**

**COMPUTER APPLICATION (THEORY)**

**(Subject Code: U3FA6004)**

**Semester: VI** **Hours: 5**
**Max. Marks: 75** **Credits: 4**

**Objective :** To make proficient with basic operation of computer in the MS Office environment.

**Unit I**

Information Technology Basics – Information definition – Prerequisite of information – need for information – components of information Technology – Role of Information Technology in Business.

**Unit II**

Word processing with MS Word - Starting MS word – MS word environment –working with word documents – working with text – working with tables – checking spelling and grammar – printing a document.

**Unit III**

Spreadsheets and MS Excel: Starting MS Excel – MS Excel environment – working with Excel workbook – working with worksheet – Formulas and Functions – Inserting Charts – printing in Excel.

**Unit IV**

Making presentation with MS power point: Starting MS power point – MS power point environment – working with power point – working with different views – designing presentation – printing in power point.

**Unit V**

Electronic Commerce – Types – Advantages and disadvantages – Electronic data interchange (EDI) – How EDI works – benefits – limitations – SMART card and its applications.

**REFERENCE BOOKS:**


1. Sanjay Sexena, A First Course in Compter, Vikas Publishing House, New Delhi.
2. Sanjay Sexena, MS Office 2000, Vikas Publishing House, New Delhi.
3. Introduction to Information Technology, IDL Group, Pearson Education, New Delhi.
4. A. Zakiuddin Ahmed, Computer Application in Business, Thakur Publishers, Chennai.


## Elective Paper - II

## INCOME TAX LAW & PRACTICE – II
## (Subject Code: U3FAE601)

**Semester: VI** **Hours: 6**
**Max. Marks: 75** **Credits: 5**

**Objective:** To gain basics of income tax law and practical application like calculations and filing returns.

**UNIT – I**

Income from Capital Gains - Basic Income under the head Capital Gains and its Computation – Capital Assets – Meaning – Exceptions – Short-term and Long-term Capital Assets – Transfer of Capital Assets – Exceptions – Computation of Short-term Capital Gain – Computation of Long term Capital Gain – Indexed Cost – Exemptions under Section 54.

**UNIT – II**

Income from Other Sources - Income under the head Income from Other Sources and its Computation – Specific Incomes and Other Incomes – Permissible Deductions – Specific Disallowances.

**UNIT – III**

Clubbing of Income and Set-off of Losses - Clubbing of Income (Aggregation of Income) – Transfer of Income without Transfer of Assets - Set-off and Carry Forward of Losses – Intra Head and Inter Head Adjustments – Carry Forward of Losses and Set-off of Losses.

**UNIT - IV**

Assessment of Individuals, Firms and AOP - Deductions from Gross Total Income – Deductions in respect of Certain Payments and Deductions in respect of Certain Incomes (80C to 80U).Computation of Taxable Income of an Individual – Computation of Income of Firms and Association of Persons.

**UNIT - V**

Filing of Return of Income, Assessment & Tax Planning - procedure for Filing of Return of Income – Time of Filing of Return – PAN – Types of Assessment– Self Assessment – Regular Assessment – Best Judgment Assessment and Income Escaping Assessment – Tax Planning – Meaning, Need and Limitations – Tax Evasion – Tax Avoidance.

**Note: Weightage of marks: Theory 40% and Problems 60%**

**Reference Books:**


1. Gaur and Narang, Income Tax Law and Practice, Kalyani Publishers, New Delhi.
2. Vinod K Singhania & Monica Singhania, Students' Guide to Income Tax, Taxmann, New Delhi.
3. Mehrotra H C, Income Tax Law and Practice, Sahithya Bhavan, Agra.
4. Reddy T S & Hari Prasad Reddy, Income Tax, Theory, Law and Practice, Margham Publications, Chennai.
5. Dinkar Pagare, Income Tax Law and Practice, Sultan Chand & Sons, New Delhi.


## Skill Based Paper IV

## PROJECT MANAGEMENT
## (Subject Code: U3FASB61)

**Semester: VI** **Hours: 3**
**Max. Marks: 75** **Credits: 3**

**Objective:** To gain the knowledge of management of project formation, selection, execution and its evaluation.

**Unit – I**

Project Management Concepts – Characteristics – Objectives – Functions – Tools and Techniques – Process of Project management – Importance – Limitations of project management.

**Unit –II**

Project Manager – Functions of project manager – Responsibility of project manager – Skills of Project Manager – Team Building – Process of project Team Building - 7'Cs of High Performance Team.

**Unit – III**

Project Formulation – Meaning – Need – Project Formulation Stages – Bottlenecks in Project Formulation – Various aspects to be considered in project formulation.

**Unit – IV**

Project Evaluation – Meaning – Objectives – Scopes – Reasons – Basic Principles governing Project Evaluation – Types – Project Evaluation Criteria.

**Unit - IV**

Meanings of Project Report – Characteristics of Project Report – Types – Contents.

**Reference Books:**


1. P. Damodharan and S. Sasi, Project Management, Thakur Publishers, Chennai.
2. K.V. Subba Rao, Project Management, Ashyahan Publishers& Distributers, New Delhi.
3. Bhavash M. Patel, Project Management, Vikas Publishing House, New Delhi.
4. Enzo Frigenti and Dennis, Project Management, Communions Publications, New Delhi.
5. Narayan, Project Management, A.P.H. Publication Corporation, New Delhi.

***DEPARTMENT OF COMMERCE [COMPUTER APPLICATIONS]***

## SEMESTER V

## COST ACCOUNTING

| | |
|---|---|
| **Core Subject [U3CA5001]** | **5 Hours per week** |
| **4 Credits** | |

**Objectives**

To make the students acquaint with the knowledge of different techniques and methods of costing.

**UNIT-I**

Cost Accounting: Introduction - Definition, Meaning and Objective - Advantages - Cost Centre and Cost Unit - Comparison of cost accounting with financial accounting - Techniques of costing - Elements of Cost - Classification of Cost – Limitation of cost accounting - Preparation of cost sheet and Tenders.

**UNIT - II**

Material Management – Purchase procedure – Various stock levels – Economic order quantity – Bin card and stores ledger – Pricing of issues – FIFO, LIFO, and Simple Average and Weighted average methods.

**UNIT - III**

Labour: Importance of Labour Cost Control - Various methods of wages payments - Calculation of Wages - Methods of Incentive Schemes - Recording Labour Time - Time Card and Job Card - Treatment of 'Over time & "Idle Time' - Labour Turnover

**UNIT - IV**

Overheads : Definition of Overheads - Meaning and Classification of overhead costs - Allocation and Apportionment - Re-Distribution (Secondary Distribution ) - Factory, Administration, Selling and Distribution overheads- Under and Over Absorption of Overheads - Machine hour Rate.

**UNIT-V**

Methods of Costing - Process Costing – Normal Loss – Abnormal Loss – Abnormal Gain - Operating Costing (Transport) – Job costing.

**TEXT BOOK:**

1. T.S. Reddy and Y. Hari Prasad Reddy: Cost Accounting, Margham Publications.

**REFERENCE BOOKS**

1. Jain and Narang : Cost Accounting,Kalyani Publications
2. S.N.Maheshwari : Cost and Management Accounting,Sulthan Chand Publications
3. S.P. Iyangar : Cost Accounting,Sulthan Chand Publications

## INCOME TAX LAW AND PRACITCE – I

**Core Subject[U3CA5002] 5 Hours per week 4 Credits**

**Objective:**

To make the students acquaint with basic knowledge of provisions of income tax.

**UNIT-I**

Income Tax Act, 1961 - Current Finance Act - Definitions - Agricultural Income - Assesses - Assessment Year - income- person - Previous Year - Residential Status and Incidence of Tax - Exempted Incomes.

**UNIT-II**

Income, under the head Salaries - Definition - Features - Allowances - Perquisites - Provident Fund - Profit in lieu of salary - Deductions - Computation of salary income.

**UNIT-III**

Income from House property - Annual Value - Determination - Let out houses - Self Occupied Houses - Computation of Income from House property.

**UNIT-IV**

Profits and Gains of Business or Profession - Definitions - Chargeability - Admissible deductions - Inadmissible Expenses Computation of Business Income - Computation of Professional Income.

**UNIT V**

Income Tax Authorities and their powers - Permanent Account Number (PAN).

**TEXT BOOK:**

A.Murthy - Income Tax Law and practice **, Vijay Nicole Imprints (P) ltd.**

**REFERENCE BOOKS:**

1. Gaur & Narang, Kalyani Publications

2. Bhagavathi Prasad: Income Tax Law and Practice, Sulthan Chand Puplications

## PRACTICAL AUDITING

**Core Subject[U3CA5003] 4 Hours per week 3 Credits**

**Objectives**

To familiarise students with various aspects of auditing

**UNIT-I**

Introduction- meaning and object of audit - difference between Auditing and accountancy - kinds of audit - advantages and limitations of Audit - audit programmes and working papers

**UNIT –II**

Internal control - Meaning and object - Internal check - Meaning and object - Internal control regarding cash purchases, sales, and payment of wages.

**UNIT-III**

Vouching - meaning - objects - features of good vouching - procedure and importance - vouching of cash transactions - verification of assets and liabilities.

**UNIT- 1V**

Auditor - Qualification, Appointment, Disqualification, Removal, Duties, Powers. Liabilities and Remuneration.

**UNIT-V**

Specialized audits - Charitable Institutions, Educational Institutions, Hospital, Hotel.

**Text Book:**

B.N. Tandon : Practical Auditing, S. Chand & Sons, New Delhi.

**REFERENCE BOOK:**

Dr. Premavathy : Practical Auditing, 2nd Edition, Sri Vishnu Publishing Co, Chennai, 2003.

## WEB TECHNOLOGY

| Core Subject[U3CA5004] | 4 Hours per week | 3 Credits |
|---|---|---|

**Objective:** To make the students acquaint with basic knowledge of web technology and its applications.

**UNIT-I**

Introduction –Meaning of Internet-History and Development of the Internet-Introduction to the world wide web-Acronyms and terms-What makes the www work-Uniform Resource locators(URIs)-www clients or "browsers"-The client-Server Model-Electronic mail-Reading an Internet address-Advantages and disadvantages of the Internet

**UNIT-II**

Introduction to HTML- Elements in HTML Document-HTML Tags-HTML Headings-HTML Rules(lines)-HTML Paragraphs-HTML Formatting tags-HTML Ordered & Unordered-HTML Images-HTML Tables.

**UNIT-III**

Linked Documents-Visiting a linked resource- Other link relationships-specifying anchors and links-Definition and usage-An HTML Link-The Href Attribute-The Name

**UNIT-IV**

Attribute-Frames-The Frame set Tag-The Frame Tag-Creating frames-Two column frameset-Adding atop Name-Removing Borders-Loading Another Frame-The No Frame.

**UNIT-V**

Introduction to JavaScript - Advantage of JavaScript - JavaScript Syntax - Data Variable - Array - Operator and Expression - Looping Constructor .

**TEXT BOOK:**

1. L. Mathu Krithigha Venkatesh, WEB TECHNOLOGY, Margham Publications

**REFERENCE BOOKS:**

1. Deitel & Deitel, internet & world wide web How to program, Pearson Education.

2. I. BayRoss, Web Enable Commercial Application Development Using HTML, DHTML, JavaScript, Pen CGI, BPB Publications, 2000.

## WEB THECHNOLOGY LAB

| | | |
|---|---|---|
| **Core Practical[U3CAPR51]** | **3 Hours per week** | **2 Credits** |

**Objective:** To make the students acquaint with basic knowledge of web technology and its practical applications.

1. Create a simple page introducing yourself how old you are, what you do, what are you like and dislike. Create another page about your favorite hobby and link it to [and from] your main page. Centre something, and put a quote on one of your pages.
2. Write a script to create an array of 10 elements and display its contents.
3. Write a function in Java script that takes a string and looks at it character by character.
4. Create a simple calculator using form fields. Have two fields for number entry & one field for the result. Allow the user to be able to use plus, minus, multiply and divide.
5. Create a document and add a link to it. When the user moves over the mouse over the link, it should load the linked document on its own.
6. Create a document that accepts the user's name in a text field form and display the sane the next time when the user visits the site informing him that he have accessed the site for the second time, and so on.

## ENTREPRENEUR DEVELOPMENT PROGRAMME

| Elective Subject[U3CAE501] | 5 Hours per week | 4 Credits |
|---|---|---|

**Objective:**

To make the students understand the basic concepts of entrepreneurship development.

**UNIT-I: CONCEPT OF ENTREPRENEURSHIP**

Meaning, characteristics and types of entrepreneurship - Entrepreneur and enterpriser - Functions of entrepreneurs – Desirable traits of successful entrepreneur.

**UNIT-II: WOMEN AND RURAL ENTREPRENEURS**

Concept of women entrepreneurs - Definition - Problems faced by women entrepreneurs - Remedies to the problems - Rural entrepreneurs - Definition - Problems of rural entrepreneurs - Steps to promote rural entrepreneurs - Small scale entrepreneurs- Organized Retail in agro based products.

**UNIT-III: PROJECT AND BUSNIESS PLANNING**

Meaning and classification of Projects - Project Ideas - Project Formulation - Feasibility Study Report - Project Selection – Project Report - Project life cycle- Business planning and raising of funds – Market segmentation and USP –Detail Knowledge of product and Customer.

**UNIT- IV: FORMS OF OWNERSHIP**

Sole Trader – Partnership- Cooperative Societies- Private Ltd. Company and Public Ltd Company, characteristics, merits and demerits-Up scaling of business.

**UNIT- V: DEVELOPMENT AND PROMOTION OF ENTREPRENEURS**

Entrepreneurship Development Programmes - Assistance by Government and Non - government agencies - Functions of DIC, SIDCO, SIPCOT, IDBI, TIIC and ICICI.

**TEXT BOOK:**

Entrepreneurial Development : N.P. Srinivasan, Margham Publishers.

**REFERENCE BOOKS:**

1. Entrepreneurial Development : P. Saravanavelan, Sulthan Chand Publications.

2.Entrepreneurial Development : Jaishree Suresh,Sulthan Chand Publications

## Business Communication

| Skill Based Subject[U3CASB51] | 4 Hours per week | 4 Credits |
|---|---|---|

**OBJECTIVE:**

To make students acquaint with various aspects of business correspondence.

**UNIT - I:**

Analysis of Business letters - basic Principles of Drafting - Appearance and Layout - Letter Style.

**UNIT - II:**

Various types of business letters - Letter of enquiry - Quotations - Offers – Orders-Cancellation- Complaints and Settlement.

**UNIT - III:**

Circular - Status enquiries - Collection Letters - Application for a situation - Letter of recommendation - Reference Letters.

**UNIT - IV:**

Company Correspondence - Correspondence with Shareholders, Debenture Holders Fixed Deposit Holders, Government Departments, Statutory Bodies, Office Staff, Customers and Public and Directors.

**UNIT-V**

Report writing - format - reports - style and language – Reports by individuals and committees - Report on Meetings - Speech writing- role of computer in business correspondence

**Text Book:**

1. N.S. Raghunathan and B. Santhanam, Business Communication, Margham Publications, 2014.

**REFERENCE BOOKS:**


1. Shirley Taylor: COMMUNICATION FOR BUSNIESS, 2nd Edition, Pearson publishers, New Delhi, 2004
2. Boove, Thilly, : Business communication today person education Pvt Ltd, Schatzmam, New Delhi 2002,
3. Penrose, Rasbery: Advanced business communication, 4th Edition, Bangalore, 2002


## MANAGEMENT ACCOUNTING

| Core Subject[U3CA6001] | 5 Hours per week | 4 Credits |
|---|---|---|

**Objective:** To familiarize the students with the basic principles of management accounting and their applications in managerial decision making.

**UNIT - I**

Management Accounting - Introduction - Meaning and Definition - Objectives - Management Accounting and Financial Accounting - Management Accounting and Cost Accounting - Limitations of Management Accounting.

**UNIT - II**

Funds Flow Analysis: Sources and Uses of Funds - Concept of Flow - Working Capital - Managerial uses of funds flow analysis - Construction of Funds flow statement - Funds from Operation.

Cash Flow Analysis: Distinction between funds flow and cash flow - construction of cash flow statement (as per AS 3) - Cash from operation.

**UNIT-III**

Ratio Analysis - Utility and Limitations of ratios - Classification of ratios - Financial ratios - Profitability ratios -Turnover ratios or Activity ratios- Proprietary ratios – Preparation of Balance sheet.

**UNIT-IV**

Marginal Costing - Introduction - Advantages - Limitations - Cost Volume Profit analysis - Fixed Cost, Variable Cost, Contribution, Break-Even Point, Margin of Safety - Application of Marginal Costing.

**UNIT-V**

Budgets, Budgeting and Budgetary Control: Concept - nature and objectives of Budgetary control - Advantages and Limitations - Classification of Budgets - Preparation of Budgets - Production Budget, Cash Budget and Flexible Budget.- Steps in budgetary Control.

**TEXT BOOKS:**

1. Management Accounting – T.S.Reddy & Y.S.Hariprasad Reddy,Margham Publications

**REFERENCE BOOKS:**

1. Dr.S.N.Maheswari : Principles of Management Accounting, Sulthan Chand Publications

2. R.S.N. Pillai and Bagavathi: Management Accounting, S.Chand Publications

## INCOMETAX LAW AND PRACTICE –II

**Core Subject[U3CA6002]** **5 Hours per week** **4 Credits**

**OBJECTIVES:**

To make the students understand important provisions of income Tax Law and computation of Income Tax.

**UNIT-I**

Capital gain - definition of Capital Assets - Kinds of Capital Assets - Exempted Capital Gains - Computations of Capital Gains.

**UNIT-Il**

Income from other Sources - Income Chargeable to Tax - Deductions - Bond Washing Transactions - Computation of Income from other Sources.

**UNIT-III**

Aggregation of Income - Deemed Incomes - Set off and Carry forward of losses - Deductions from Gross Total Income.

**UNIT-IV**

Assessment of individuals - Computation of Total Income and Tax Liability.

**UNIT-V**

Procedure for Assessment - Types of Assessment - Filing of Returns - Advance Payment of Tax - Deduction of Tax at Source.

**Text Book:**
**A.Murthy -** Income Tax Law and Practice**, Vijay Nicole Imprints (P) ltd**
**REFERENCE BOOKS:**
I. **H.C. Mehrotra**: Income Tax Law and Accounts.
2. **Bhagavathi Prasad**: Income Tax Law and Practice.

## BANKING LAW AND PRACTICE

| Elective Subject[U3CA6003] | 4 Hours per week | 4 Credits |
|---|---|---|

**Objectives**

To make students understand the role & functioning of commercial banks and the central bank.

**UNIT-I**

Origin of Bank - Banking Regulation Act, 1949 -Definition of Banking, Provisions, relating to Licensing, Opening of branches, Functions of Bank, Inspection - Role of Bank in Economic Development - Central Bank and Role of RBI and their functions- Private Banks

**UNIT - II**

Opening of an account - Types of Deposit Account - Types of customers (Individuals, Firms, Trusts and Companies) - Importance of Customer relations - Customer grievances and redressals - Ombudsman. Principles of Lending - Types of Borrowings - Precautions to be taken by a banker.

**UNIT-III**

Commercial Banks - Functions - Accepting Deposits - Lending of Fund, E-Banking - RTGS- ATM Cards, Debit Cards, Personal Identification Number - Online enquiry and update facility - Electronic Fund Transfer-Electronic Clearing System.

**UNIT – IV**

Negotiable Instruments - Definition and features of Promissory Note, Bills of Exchange, Cheque, Draft – Endorsements – legal effects of the transfer by endorsement – Kinds of endorsement.

**UNIT-V**

Crossing – types of crossing – lifting of crossing - Material Alteration - Paying Banker - Right and Duties - statutory Protection - Dishonour of Cheques - Role of Collecting Banker.

**Text Book:**

B.Santhanam : Banking Theory, Law & Practice – Margham Publications

**REFERENCE BOOKS:**

1. S.N. Maheshwari; Banking Law Theory and Practice, 1st Edition, Kalyani Publishers, New Delhi, 2005.

2. Parameshwaran. R; Indian Banking, 4th Edition, S. Chand and Co, New Delhi, 2005, S. Natarajan

3. Dr.G. Gurusamy: Banking Theory Law and Practice, Vijay Nicolas Imprints (p) Ltd, Chennai, 2005.

## PROJECT (COMMERCE) VIVA VOCE

| Core Subject[U3CAPJ61] | 4 Hours per week | 3 Credits |
|---|---|---|

**Objectives:**

To bridge the gap between theory and practice, and acquaint the students with practical aspect of the company management and application of computer.

Supervised Institutional Training shall be integral part of the Course. It is to a be sort of job testing program to bridge the gap between theory and practice. It is designed to create a natural interest in the practical aspects of the Company management so as to stimulate trainee's desire to face its challenges and problems.

The training should be given under supervision and guidance of the Training Officer of the Institution. The details of the training given and the assessment of each student in that regard should be fully documented.

The duration of the training shall be for a period of 30 days during the third year. The training shall broadly relate to [a] Office Management and [b] Computer Application.

The training relating to Office Management may be designed to acquaint the trainees with:

1. Company's activities, organization structure, departments and authority.
2. Office layout,' working conditions, office maintenance, safety and sanitary conditions.
3. Study of the Secretarial service, Communication, Equipments, Postal and Mailing services and equipments.
4. Acquaintance with office machines and equipments and accounting machines
5. Acquaintance with filing department, sales, purchases, sales accounts, salary, administration and personnel departments.

The training pertaining to computer application shall be regarding. The use of computer in the Organization and the effectiveness of the same on the organization.

The following types of organizations may be selected for the training:

1. Public Limited Companies Both Industrial and Commercial
2. Statutory bodies, Public Enterprises and Public Utilities like LI.C, Electricity Board, Housing Board and Chambers of Commerce, Cooperative Societies and Banks.
3. Office Equipment Marketing Organizations.

**NOTE:**

The paper on Institutional Training shall carry hundred marks and Internal and External Viva- Voce based on a report submitted by the candidate, under the guidance of the faculty member of the college assisted by the training officers of the Institutions providing training.

The report shall be around 50 typed pages, excluding tables, figures, bibliographies and appendices. The report should be evaluated jointly by the INTERNAL and EXTERNAL Examiners and conduct Viva-Voce, A Candidate Failing to secure the minimum for a pass [40%] shall be required to resubmit this report to the department.

The evaluation of project report and Viva-Voce shall be for a maximum of 10 candidates per session. The marks shall consist of Project Report 75 Marks and Viva Voce 25 Marks.

## Multimedia (Theory)

| Core Subject[U3CA6004] | 4 Hours per week | 3 Credits |
|---|---|---|

**Unit I Introduction to Multimedia**

Introduction - scope of multimedia-types of multimedia - applications-interactive multimedia and non- interactive multimedia.

**Unit II Setting up a Multimedia Studio**

Multimedia hardware -types of multimedia hardware-multimedia add-on peripherals-external multimedia equipments-installing tips- plug and play - typical multimedia system configuration-multimedia upgrade kits.

**Unit III Multimedia Audio**

Digital audio definition- audio sampling-audio sampling parameters-digital audio recording pitfalls-digital audio file sizes- digital audio file formats.

**Unit IV Digital Texts**

Introduction-text as a part of multimedia-text design basics -text design parameters-titling- jaggies and anti-aliasing-special effects for titles-drop shadows-bevel effects-3 Dimensional text -text animations-quantitative aspects of content-hypermedia-hypertexts-embedded hyperlinks in multimedia projects-designing a hypermedia system-text editing software tools.

**Unit V Multimedia Graphics**

Introduction-basic concept of color display-color depth- resolution-multimedia kiosks - touch screen technology-composition of touch screen monitors-presentation display systems-LED technology-LCD projection panels-LCD panels-types and specifications-multimedia animation-2 D animation-3D animations-multimedia videos-role of digital videos in multimedia projects.

**Text Book:**

Multimedia Magic(Revised and updated second editions) – S.Gokul, BPB PUBLICATIONS.

**Reference book:**

1) Multimedia – M. Mahalaksmi, Margham Publications.

## Multimedia (Demonstration)

| Core Subject[U3CA6004] | 1 Hour per week | 0 Credits |
|---|---|---|

1. Installing multimedia peripherals (Run any one device driver).

2. Give a demo for sound card connectivity.

3. How to edit an antialiasing text and give demo for generating 3D Text (Photoshop).

4. Give demo for any one software editing text tool (using photoshop).

5. Give a demo for animation in multimedia project. (Use Powerpoint & Coreldraw).

## HUMAN RESOURCE MANAGEMENT

| Core Subject[U3CAE601] | 4 Hours per week | 4 Credits |
|---|---|---|

**Objective:**

To make the students familiarise with the basic concepts of Human Resource Management.

**Unit I**

Meaning, Nature and scope of HRM – Difference between Personnel Management and HRM – Functions of HRM – Environment of HRM – Recent trends in HRM.

**Unit II**

Human Resource Planning – Recruitment – Sources of Recruitment – Selection – Methods of Selection – Placement-Job Analysis and Job Description – Outsourcing of HRM Activities – Recruitment procedure of UPSC, DRDO, RRB, TRB,TNPSC.

**Unit III**

Induction –Meaning of Training and Development - Training Methods – Techniques – Identification of Training needs – Training Methods of Leading MNCs(Yahoo, Pepsi, Hyundai, TCS, Ford)

**Unit IV**

Performance Appraisal – Need for Appraisal – Methods – Job Evaluation –Wages and Salary Administration – Performance Appraisal in MNCs – Stress Management – Grievance Redressal.

**Unit V**

Transfer – Promotion and termination of services – Career development – Mentoring – HRM Audit – Nature – Benefits – Scope –Approaches – Fringe benefits in Govt. companies and MNCs.

**Text Books:**

1) Aswathappa :Human Resource and Personnel Management,Himalaya Publishing House
2) J Jayasankar :Human Resource Management,Sulthan Publications.

**REFERENCE BOOKS:**

1) Subba Rao P : HRM and Industrial Relations, Himalaya Publishing House
2) Memoria C B :Personnel Management

## ELECTRONIC COMMERCE AND ITS APPLICATIONS

| Skill Based Subject[U3CASB61] | 3 Hours per week | 3 Credits |
|---|---|---|

**Objectives:**
To provide the knowledge about commerce through electronic medium & information system.

**UNIT I**

Electronic Commerce Framework, Traditional Vs. Electronic Business Application, the Anatomy of E-Commerce Applications. Network infrastructure for E-Commerce.

**UNIT II**

The internet as a Network Infrastructure, Network Security and Firewalls – Client Server Network Security – Firewalls and Network Security – Data and Message Security – Encrypted Documents and Electronic Mail.

**UNIT III**

Electronic Commerce and World Wide Web, Consumer Oriented E-Commerce, Electronic Payment Systems

**UNIT IV**

Electronic Data Interchange (EDI), EDI application in business, EDI and E-commerce –

EDI implementation.

**UNIT V**

Corporate Digital Library – Advertising and marketing on the Internet – E-Commerce Catalogs or Directories.

**TEXTBOOK:**

Frontiers of Electronic Commerce, R. Kalakota and Andrew. B. Whinston, Pearson , 11th Edition , 2011.

**REFERENCE BOOKS:**

1. Understanding Electronic Commerce, Daid Kosiur, Microsoft Press, 1997.
2. From EDI to Electronic Commerce, Soka, McGraw Hill, 1995.
3. Electronic Commerce Management, Saily Chan, John Wiley, 1998.

# *DEPARTMENT OF COMMERCE*

**Core Paper – XIII**

**COST ACCOUNTING - I**

**(Subject Code: U3CO5001)**

**Semester: V** **Hours: 5**

**Max. Marks: 75** **Credits: 4**

**Objective:** To enable the students to understand the concept and various techniques used in Cost Accounting.

**Unit – I: Introduction**

Cost Accounting – Nature and Scope – Objectives, Advantages and Limitations – Financial Vs Cost Accounting – Cost Concepts and Classification including Zero Based Costing - Elements of Cost - Cost Sheets and Quotation – Reconciliation of Cost and Financial Profits.

**Unit – II: Materials**

Material Control – Inventory Control – ABC Technique – Levels of Stock and EOQ – Perpetual Inventory System.

**Unit – III: Pricing of Material**

Methods of Pricing of Material Issues - FIFO – LIFO – Simple and Weighted Average Method – Accounting for Material Losses.

**Unit – IV: Labour**

Labour Turnover – Idle and Overtime – Remuneration and Incentives – Time Rate System – Piece Rate System – Taylor's , Merrick's, Gantt's, Halsey and Rowan Plans – Calculation of Earnings of Workers.

**Unit – V: Overhead**

Classification of Overhead Costs – Allocation, Absorption and Apportionment of Overhead Cost – Primary and Secondary Distribution of Overheads – Computation of Machine Hour Rate and Labour Hour Rate.

**Note: Weightage of marks - Theory 20% and Problems 80%.**

**Text & Reference Books:**

1. S.P. Jain & Narang, Cost Accounting, Kalyani Publishers, New Delhi.

2. S.N. Maheshwari, Principles of Cost Accounting, Sultan Chand & Sons, New Delhi.
3. T.S.Reddy and Hari Prasad Reddy, Cost Accounting, Margham Publication, Chennai.
4. S.P. Iyengar, Cost Accounting, Sultan Chand & Sons, New Delhi.
5. A. Murthy and Dr. A. Gurusawamy, Cost Accounting, Vijay Nicole Imprints Private Ltd., Chennai.

**Core paper - XIV**

**MANAGEMENT ACCOUNTING – I**

**(Subject Code: U3C05002)**

**Semester: V** **Hours: 5**

**Max. Marks: 75** **Credits: 4**

**Objective:** To enable the students to understand the concept and various tools of Management Accounting.

**Unit – I: Introduction**

Management Accounting – Meaning – Definition - Objectives – Nature & Scope – Advantages & Limitations – Management Accounting Vs. Financial Accounting – Management Accounting Vs. Cost Accounting – Duties of a Management Accountant.

**Unit – II: Analysis and Interpretation**

Financial Analysis – Types – Tools – Comparative Statements – Common Size Financial Statements – Trend Percentages.

**Unit – III: Ratio Analysis**

Profitability Ratios - Turnover Ratios – Financial Ratios - Advantages & Limitations of Ratio Analysis – Preparation of Financial Statements from Ratios.

**Unit – IV: Fund Flow Statement**

Meaning - Need – Advantages & Limitations – Statement of Changes in Working Capital – Calculation of Funds from Operation – Preparation of Fund Flow Statement.

**Unit – V: Cash Flow Statement**

Meaning - Objectives and Scope – Fund Flow Statement Vs Cash Flow Statement – Preparation of Cash Flow Statement as per AS – 3.

**Note: Weightage of Marks - Theory 20% and Problems 80%.**

**Text & Reference Books:**


1. I M Pandey, Management Accounting, Vikas Publishing House, New Delhi.
2. S N. Maheswari, Management Accounting, Sultan Chand & Sons, New Delhi.
3. Khan and Jain, Management Accounting, Tata McGraw Hill, New Delhi.
4. Sharma & Sasi K. Gupta, Management Accounting, Kalyani Publications, New Delhi.
5. T.S.Reddy & Y. Hari Prasad Reddy, Management Accounting, Margham Publications, Chennai.


**Core Paper - XV**

## AUDITING

**(Subject Code: U3CO5003)**

**Semester: V** **Hours: 5**

**Max. Marks: 75** **Credits: 4**

**Objective:** To familiarize the students with the principles of auditing.

**Unit - I: Introduction**

Meaning and Definitions of Auditing – Objectives – Types – Advantages and Limitations – Qualities of an Auditor - Accountancy, Auditing and Investigation.

**Unit – II: Internal Control and Internal Check**

Internal Control – Internal Check and Internal Audit – Audit Programme - Audit Note Book – Working Papers – Vouching and Verification of Trading Transactions – Vouching of Impersonal Ledger.

**Unit – III: Verification and Valuation**

Verification and Valuation of Assets and Liabilities – Auditor's Position regarding the Valuation and Verification of Assets and Liabilities - Depreciation – Reserves and Provisions – Secret Reserves.

**Unit – IV: Company Audit**

Company Audit – Qualifications and Disqualifications of Auditors - Appointment and Removal – Rights and Duties – Comptroller & Auditor General (CAG) – Appointment –

Functions, Rights and Duties – Branch, Joint and Special Audit – Audit Report – Types of Audit – Introduction to Accounting Standards and GAAP.

**Unit – V: Investigation and E-Audit**

Investigation – Objectives – Differences between Investigation and Auditing – Points to be noted while conducting an Investigation – Auditing in an EDP Environment - Audit of Computerized Accounts – Electronic Audit – Use of Computers in Auditing.

**Text & Reference Books:**


1. B.N. Tandon, Practical Auditing, S Chand & Co., New Delhi.
2. B.N. Tandon, S. Sudharsanam & S. Sundharabahu, Practical Auditing, S. Chand & Co., New Delhi.
3. V.H. Kishadwala, Auditing Principles & Practices, Sultan Chand & Sons, New Delhi.
4. Kamal Gupta & Ashok Arora, Fundamentals of Auditing, TATA McGraw Hill Publication, New Delhi.
5. Dr. K. Sundar, Auditing, Vijay Nicole Imprints Private Ltd., Chennai.


**Core Paper - XVI**

## HUMAN RESOURCE MANAGEMENT

**(Subject Code: U3CO5004)**

**Semester: V** **Hours: 5**

**Max. Marks: 75** **Credits: 4**

**Objective:** To familiarize students with the various techniques in HRM that contributes to the development of an Organization.

**Unit – I: Introduction**

Concept of HRM – Nature and Scope of HRM – Characteristics – Objectives – Importance – Functions – HRM in a Changing Environment.

**Unit – II: Human Resources Planning and Recruitment**

Need and Importance of HR Planning – Steps in HR Planning – Job Analysis – Job Description – Job Specification - Recruitment – Meaning and Definition – Sources of

Recruitment – Techniques of Recruitment – Selection Process - Testing – Interviewing – Placement and Induction.

**Unit – III: Training and Development**

Concept of Training – Need and Importance of Training – Methods and Techniques of Training – Evaluating Training Effectiveness – Executive Development – Methods and Techniques of Executive Development.

**Unit – IV: Performance and Potential Appraisal**

Concepts – Objectives – Importance – Methods of Performance Appraisal - Traditional and Modern Methods – Potential Appraisal.

**Unit – V: Employee Grievances and Employee Discipline**

Meaning and Features of Grievances – Sources of Grievances – Grievances Procedure – Grievances Redressal System – Meaning and Features of Discipline – Objectives – Types – Causes of Indiscipline – Penalties and Punishments.

**Text & Reference Books:**


1. Decenzo & S.P. Robbins, Personnel / Human Resource Management, Prentice David Hall India, New Delhi.
2. C.B. Gupta, Human Resource Management, Sultan Chand and Sons, New Delhi.
3. K. Sundar & J. Srinivasan, Essentials of Human Resource Management, Vijay Nicole Imprints Private Ltd., Chennai.
4. S.S Khanka, Human Resource Management, S. Chand Publishing, New Delhi.
5. J. Jayasankar, Human Resources Management, Margham Publications, Chennai.

**Elective Paper - I**

**INCOME TAX LAW & PRACTICE – I**

**(Subject Code: U3COE501)**

**Semester: V** **Hours: 6**

**Max. Marks: 75** **Credits: 5**

**Objective:** To introduce the students to concepts of Income tax and to give an insight into the different heads of income.

**Unit – I: Basic Concepts & Residential Status**

Basic Concepts – Assessment Year – Previous Year – Persons – Assessee – Income – Gross Total Income – Determination of Residential Status – Individual – HUF – Firm – Company – Relationship between Residential Status and Incidence of Tax.

**Unit – II: Exempted Incomes & Income from Salaries**

Incomes Exempt from Income Tax – Income under the head Salaries and its Computation – Characteristics of Salary Income – Different Forms of Allowances – Perquisites – Profits in Lieu of Salary – Deductions from Salary Income – Treatment of Provident Funds – Deduction under Section 80C.

**Unit – III: Income from House Property**

Income from House Property – Basis of Charge – Computation - Exemptions – Annual Value – Self-Occupied and Let-out Properties – Partly Let Out and Partly Self-Occupied – Deductions.

**Unit - IV: Profits & Gains of Business & Profession**

Computation of Income under the head Profits and Gains of Business or Profession – Basis of Charge – Basic Principles – Specific Deduction under the Act – General Deductions – Specific Disallowances – Deemed Profits.

**Unit - V: Depreciation**

Depreciation Allowance – Section 32 – Conditions for Claiming Depreciation – Block of Assets – Computation of Normal Depreciation Allowance – Additional Depreciation – Conditions and Rates of Depreciation – Meaning of Actual Cost – Unabsorbed Depreciation – Terminal Depreciation – Balancing Charge.

**Note: Weightage of marks - Theory 40% and Problems 60%.**

**Text & Reference Books:**


6. Gaur & Narang, Income Tax Law and Practice, Kalyani Publishers, New Delhi.
7. Vinod K Singhania & Monica Singhania, Students' Guide to Income Tax, Taxmann, New Delhi.
8. Mehrotra H C, Income Tax Law and Practice, Sahithya Bhavan, Agra.
9. Reddy T S & Hari Prasad Reddy, Income Tax, Theory, Law and Practice, Margham Publications, Chennai.
10. Dr. A. Murthy, Income Tax, Vijay Nicole Imprints Private Ltd., Chennai.


## Skill Based Paper - III

## E - COMMERCE

## (Subject Code: U3COSB51)

**Semester: V** **Hours: 4**

**Max. Marks: 75** **Credits: 3**

**Objective:** To familiarize the students to concepts of Electronic Commerce.

**Unit - I: Introduction to E-Commerce**

Meaning and Definition of E-Commerce – Features of E-Commerce – Advantages and Disadvantages – Issues and Constraints – Traditional Commerce Vs. E-Commerce – Application of E-Commerce in Business.

**Unit – II: E-Business Models**

Introduction to E- Business - E-Commerce Models – Models based on Transaction Parties – B2C – B2B – C2C – Models based on Transaction Types – Brokerage Model, Aggregate Model, Community Model, Manufacturer Model and Marketplace Model (Basic Concepts only).

**Unit – III: Electronic Data Interchange**

Electronic Data Interchanges (EDI) – Meaning – Benefits of EDI – Process of EDI – Components of EDI – Application of EDI in business – Documents Library.

**Unit – IV: E-Marketing & E-CRM**

E-Marketing – Meaning – Traditional Marketing vs. E- Marketing – Online Marketing – Pros & Cons of Online Shopping – E- Advertising – E- Branding – Target Markets – Introduction to Customer Relationship Management – E- CRM.

**Unit – V: E – Banking & E - Communication**

E-Banking – Meaning – Features – Mobile Banking - E-Payment System – Classification of E-Payment System – Risks in E-Payment System.

E-Communication – Meaning – Types of E-Communication – Advantages and Disadvantages of E-Communication.

**Text & Reference Books:**


1. Elias M. Awad, Electronic Commerce, Prentice Hall of India, New Delhi.
2. Gary P.Schneider, E-Commerce – Strategy, Technology and Implementation, Cengage Learning India Pvt. Ltd., New Delhi.
3. P.T.Joseph, S.J., E- Commerce – An Indian Perspective, Prentice Hall of India, New Delhi.
4. K. Abirami Devi & Dr. M. Alagammai, E-Commerce, Margham Publications, Chennai.
5. Greenstein & Merylin, Electronic Commerce, Tata Mc.Graw Hill, New Delhi.


## Core Paper - XVII
## COST ACCOUNTING - II
## (Subject Code: U3CO6001)

**Semester: VI** **Hours: 5**

**Max. Marks: 75** **Credits: 4**

**Objective:** To familiarize the students with various techniques of Cost Accounting.

**Unit – I: Job and Batch Costing**

Job Costing – Definition and Features – Procedure – WIP – Cost Accumulation. Batch Costing – EBQ.

**Unit – II: Contract Costing**

Definition – Features – Work Certified and Uncertified – Incomplete Contract – Escalation Clause – Cost Plus Contract – Preparation of Contract Account.

**Unit – III: Process Costing**

Definition and Features – Job vs. Process Costing – Normal Loss and Abnormal Loss – Abnormal Gain – By Product and Joint Products – Equivalent Production - Process Accounts.

**Unit – IV: Operating Costing**

Operating or Service Costing: Operating Cost Units – Operating Costing in some Service Industries – Transport Costing – Advantages of Operating Costing in Transport Organization – Costing Procedure in Transport Organization – Costing for Hotels, Hospitals & Cinema Theatres.

**Unit – V: Standard Costing and Variance Analysis**

Standard Costing - Meaning – Advantages and Limitations - Analysis of Variance - Material Variance - Labour Variance - Overhead Variance.

**Note: Weightage of marks - Theory 20% and Problems 80%.**

**Text & Reference Books:**


1. S.P. Jain, Narang, Cost Accounting, Kalyani Publishers, New Delhi.
2. S.N. Maheshwari, Principles of Cost Accounting, Sultan Chand & Sons, New Delhi.
3. T.S.Reddy and Hari Prasad Reddy, Cost Accounting, Margham Publication, Chennai.
4. S.P. Iyengar, Cost Accounting, Sultan Chand & Sons, New Delhi.
5. P.C. Tulsian, Cost Accounting, Tata McGraw Hills, New Delhi.


## Core paper-XVIII

## MANAGEMENT ACCOUNTING – II

**(Subject Code: U3C06002)**

**Semester: VI** **Hours: 5**

**Max. Marks: 75** **Credits: 4**

**Objective:** To familiarize the students with various tools of Management Accounting.

**Unit – I: Budget & Budgetary Control**

Meaning and Definition - Objectives - Advantages - Limitations – Classification of Budgets – Zero Based Budgeting – Preparation of Sales Budget – Production Budget – Cash Budget – Flexible Budget – Master Budget.

**Unit – II: Marginal Costing**

Marginal Costing – Meaning – Definition – Features – Advantages & Limitations – Cost-Volume-Profit Analysis – Break Even Point – Margin of Safety – Pricing Decision – Make or Buy Decision.

**Unit – III: Capital Budgeting**

Capital Budgeting – Features – Need and Significance – Evaluation of Capital Budgeting Proposals – Pay Back Period (PBP) – Accounting Rate of Return (ARR) – Discounted Cash Flows – Net Present Value (NPV) – Internal Rate of Return (IRR) – Profitability Index Method (PIM).

**Unit – IV: Working Capital Management**

Meaning – Need and Objectives of Working Capital – Types of Working Capital – Sources of Working Capital – Advantages & Limitations - Determination of Working Capital Needs.

**Unit – V: Management Audit**

Meaning - Objectives of Management Audit – Need for Management Audit –Difference between Financial Audit and Management Audit – Conducting Management Audit.

**Note: Weightage of Marks - Theory 20% and Problem 80%.**

**Text & Reference Books:**


1. S N. Maheswari, Management Accounting, Sultan Chand & Sons, New Delhi.
2. Khan and Jain, Management Accounting, Tata McGraw Hill, New Delhi.
3. I M Pandey, Management Accounting, Vikas Publishing House, New Delhi.
4. Dr. A. Murthy & Dr. A. Guruswamy, Management Accounting, Vijay Nicole imprints Private Ltd., Chennai.
5. T.S.Reddy & Y. Hari Prasad Reddy, Management Accounting, Margham Publications, Chennai.

**Core Paper – XIX**

**ENTREPRENEURIAL DEVELOPMENT**

**(Subject Code: U3CO6003)**

**Semester: VI** **Hours: 5**

**Max. Marks: 75** **Credits: 4**

**Objective:** To impart conceptual knowledge about entrepreneurship to the students so as to inspire them to start their own business.

**Unit – I: Introduction**

Entrepreneurship - Definition – Concept – Theories – Factors Influencing Entrepreneurship.

Entrepreneur - Definition – Traits – Use of Entrepreneurial Aptitude Test – Classification of Entrepreneurs based on Type of Business and Size of Business – Clarence Danhof's Classification – Women entrepreneurs – Social Entrepreneurs - Role of Entrepreneurs in Economic Development – Challenges faced by Entrepreneurs.

**Unit – II: Starting of an Enterprise**

Identification of Business Opportunity - Idea Generation – Overview of Techniques of Idea Generation – Identification and Selection of Opportunity.

Business Plan - Meaning - Significance – Formulation.

Project Management - Project – Meaning – Project Appraisal – Overview of Methods of Project Appraisal – Project Report – Preparation of Project Report.

**Unit – III: Role of Promotional & Developmental Institutions in Entrepreneurial Growth**

Functions of EDPs – Industrial estates – KVIC – NIESBUD – SISI – SIDC – TCO – SIPCOT – ITCOT – DIC – NSIC – SIDO.

**Unit – IV: Role of Financial Institutions in Entrepreneurial Growth**

Financing an Enterprise – Commercial Banks – Venture Capitalists – Angel Investors – Crowdfunding – Development Banks – Financial institutions – TIIC – SIDBI – IDBI – IFCI – ICICI – SFC – IIBI.

**Unit – V: Government Policies and Benefits**

Tax Benefits – Tax Holidays – Allowance for deducting Depreciation – Rehabilitation Allowance – Benefits to Small Scale New Businesses under Industrial Policy Resolution,

1990 – Promotional Packages and Financial Assistance Recommended under MSMED Act, 2006.

**Text & Reference Books:**


1. S.S. Khanka, Entrepreneurial Development, S. Chand & Co., New Delhi.
2. C.B. Gupta & N.P. Srinivasan, Entrepreneurial Development, Sultan Chand & Sons, New Delhi.
3. Ravindranath V. Badi & Narayana V. Badi, Entrepreneurship, Vrinda Publications (P) Ltd., New Delhi.
4. Robert D. Hisrich, Michael P. Peters & Dean A. Shepherd, Entrepreneurship, Tata McGraw Hill Publishing Company Limited, New Delhi.
5. Jay Shree Suresh, Entrepreneurial Development, Margham Publications, Chennai.


## Core Paper – XX

## FINANCIAL MANAGEMENT

## (Subject Code: U3CO6004)

**Semester: VI** **Hours: 5**

**Max. Marks: 75** **Credits: 4**

**Objective:** To introduce to the students the concepts of Financial Management.

**Unit – I: Introduction**

Meaning of Financial Management – Definition – Scope – Objectives – Profit Maximization Vs Wealth Maximization – Role of Financial Manager – Significance of Financial Management – Liquidity Vs Profitability.

**Unit – II: Cost of Capital**

Meaning – Components of Cost of Capital – Importance – Factors determining Cost of Capital – Computation of Cost of Capital – Cost of Debt – Cost of Equity Capital – Cost of Redeemable Preference Share (excluding Dividend Yield Method).

**Unit – III: Capital Structure**

Capital Structure – Meaning – Optimum Capital Structure – Features of an Appropriate Capital Structure – Factors Determining Capital Structure – Capital Structure Theories.

**Unit – IV: Leverages**

Meaning – Types – Operating Leverage – Degree of Operating Leverage – Financial Leverage – Degree of Financial Leverage - Combined Leverage.

**Unit – V: Dividend Policy**

Dividend Policy – Objectives of Dividend Policy – Dividend Theories – Walter, Gordon and MM Hypothesis Models.

**Note: Weightage of Marks – Theory 20% Problem 80%.**

**Text & Reference Books:**


1. Pandey I M, Financial Management, Vikas Publishing House, New Delhi.
2. Maheshwari S N, Financial Management, Sultan Chand & Sons, New Delhi.
3. Khan M Y & Jain P K, Financial Management, Tata McGraw Hill Publishing Co., New Delhi.
4. Rathnam P V, Financial Management – Problems and Solutions, Kitab Mahal, Lucknow.
5. Murthy A, Financial Management, Margham Publications, Chennai.


## Elective Paper - II

## INCOME TAX LAW & PRACTICE – II

**(Subject Code: U3COE601)**

**Semester: VI** **Hours: 6**

**Max. Marks: 75** **Credits: 6**

**Objective:** To equip the students with the working knowledge of Income Tax.

**Unit – I: Capital Gains**

Capital Gains and its Computation – Capital Assets – Meaning – Exceptions – Short-term and Long-term Capital Assets – Transfer of Capital Assets – Exceptions – Computation of Short-term Capital Gain – Computation of Long term Capital Gain – Indexed Cost – Relevant exemptions under Section 10 (Sub-Sections 36, 37, 38, 40) – Deductions under Section 54.

**Unit – II: Income from Other Sources**

Income under the head Income from Other Sources and its Computation – Specific Incomes and Other Incomes – Permissible Deductions – Specific Disallowances.

**Unit – III: Clubbing of Income & Set-Off and Carry forward of Losses**

Clubbing of Income (Aggregation of Income) – Transfer of Income without Transfer of Assets - Set-Off and Carry Forward of Losses – Intra Head and Inter Head Adjustments – Carry Forward and Set-Off of Losses.

**Unit - IV: Assessment of Individuals, Firms and AOP**

Deductions from Gross Total Income – Deductions in respect of Certain Payments and Deductions in respect of Certain Incomes (80C to 80U).Computation of Taxable Income of an Individual – Computation of Income of Firms and Association of Persons.

**Unit - V: Filing of Return of Income, Assessment & Tax Planning.**

Procedure for Filing of Return of Income – E-Filing - Time of Filing of Return – PAN – Types of Assessment– Self Assessment – Regular Assessment – Best Judgment Assessment and Income Escaping Assessment – Tax Planning – Meaning, Need and Limitations – Tax Evasion – Tax Avoidance.

**Note: Weightage of marks - Theory 40% and Problems 60%.**

**Text & Reference Books:**


1. Gaur & Narang, Income Tax Law and Practice, Kalyani Publishers, New Delhi.
2. Vinod K Singhania & Monica Singhania, Students' Guide to Income Tax, Taxmann, New Delhi.
3. Mehrotra H C, Income Tax Law and Practice, Sahithya Bhavan, Agra.
4. Reddy T S & Hari Prasad Reddy, Income Tax, Theory, Law and Practice, Margham Publications, Chennai.
5. Dinkar Pagare, Income Tax Law and Practice, Sultan Chand & Sons, New Delhi.

**Skill Based Paper - IV**

**INTRODUCTION TO TALLY**

**(Subject Code: U3COSB61)**

**Semester: VI** **Hours: 4**
**Max. Marks: 75** **Credits: 3**

**Objective:** To impart theoretical and practical Accounting Knowledge.

**Unit - I: Introduction to Accounting**
Basic Concepts of Accounting – Types of Accounts – Accounting Rules – Journal – Ledger – Trial Balance – Final Accounts (Theory Only).

**Unit - II: Introduction to Tally**
Salient features of Tally – General Features - Accounting Features – Inventory Features. Creation of a Company – Altering, Deleting and Shutting a Company – Company Information.

**Unit – III: Classification of Accounts**
Introduction – Groups – Sub-Groups – Creation of Groups – Alteration of Groups – Deletion of Groups – Creating, Displaying and Altering Multiple Groups. Process of Creating Ledger – Displaying and Altering Individual and Group Ledgers.

**Unit – IV: Vouchers**
Introduction to Vouchers –Types of Vouchers - Predefined Vouchers – Creation and Alteration of Vouchers – Cancellation and Deletion of Vouchers (Excluding Inventory Vouchers).

**Unit – V: Preparation of Final Accounts**
Preparation of Trial Balance – Trading Account – Profit & Loss Account – Balance Sheet – Invoice Printing.

**Text & Reference Books:**


1. S. Palanivel, Tally – Accounting Software, Margham Publications, Chennai.
2. A.K. Nadhani & K.K. Nadhani, Tally 9, BPB Publications, New Delhi.
3. Asok K Nadhani, Tally ERP 9 Made Simple: Basic Financial Accounting, BPB Publications, New Delhi.
4. Kogent Learning Solutions Inc., Tally ERP 9 in Simple Steps, DreamTech Press Inc. New Delhi.
5. Shraddha Singh, Navneet Mehra, Tally ERP 9 – Power of Simplicity, V & S Publishers, New Delhi.

# *DEPARTMENT OF ENGLISH*

**B.A.ENGLISH LITERATURE**
**III YEAR SEMESTER -V**

**PAPER IX**

**ENGLISH PHONETICS Code: U3EN5001 Credits: 4**
**Hrs/week: 5**

***Objectives:*** *Phonetics can be very useful for the students in any field of academics. Students majoring in English, education, psychology, sociology and political science benefit from studying phonetics. The prime and prominent role of studying phonetics is to learn about underlying principles of speech sounds and becoming aware of its many application.*
*To learn phonics alphabets and combinations – To introduce to vowel sounds- To identify different branches of linguistics- To trace the historical development of linguistics.*

**Unit – I**

1. Elements of English language – Definitions
   (i) Phonology (ii) Morphology (iii) Syntax (iv) Meaning
2. Social, psychological and applied perspectives
3. Organs of Speech and their role

**Unit – II**

1. Sounds of English language – Consonants – Vowels – Diphthongs.
2. Classification of Consonants – according to place of articulations – manner of articulation
3. Classification of Vowels
4. Classification of Diphthongs – closing diphthongs – centering diphthongs

**Unit – III**

1. Syllable
2. Stress – word stress (Primary & Secondary) – Sentence stress.
3. Accent and rhythm in connected speech

**Unit - IV**

1. Strong and weak form
2. Tone group (Breath group)
3. Intonation

**Unit – V** Phonemic transcription: Individual Words – Sentences

Reference books:

1. **English Phonology: An Introdution.** Heinz J. Giegerich (Pub: Cambridge)
1. **Elements of General Linguistics**. Dr. Sharad Rajimwale (Pub:Rama Brothers)
2. **Elements of Linguistics and Phonetics .** Dr. Amresh Sharma (Pub: Ritu Publication, Jaipur)

**B.A ENGLISH LITERATURE**

**SEMESTER –V**
**CORE PAPER X**

**AMERICAN LITERATURE- II**

**Hrs/week: 5** **Code:U3EN5002** **Credits: 4**

**Objectives:**
*To understand nation's unique culture – to understand different periods and movements – to understand how literature created national identity – to relate different works to each other – to understand political and social ideas.*

**Unit I** – Poetry

a) Emily Dickinson- A Bird Came Down the Walk
b) Robert Frost - Stopping by the Woods on a Snowy Evening

**Unit II**- Poetry

a) R.W. Emerson- Brahma
b) W. Whitman - O Captain, my Captain

**Unit III**- Prose

a) R.W. Emerson- The American Scholar
b) H.D. Thoreau- What I Lived For

**Unit IV**- Drama

a) Eugene O'Neil- The Emperor Jones

**Unit V**- Fiction

a) E. Hemingway- A farewell to Arms

Reference books:

1. American Literature of the Nineteenth Century –An anthology, Eurasia Publishing House- New Delhi'
2. American Literature 1890-1965, an Anthology, Eurasia Publishing House, New Delhi.

**B.A.ENGLISH LITERATURE III YEAR**
**SEMESTER V**
**CORE PAPER XI**
**20TH CENTURY LITERATURE – I**

**Hrs/week:5** **Code: U3EN5003** **Credits:4**

***Objectives:***

*To achieve sense of the historical significance- to develop critical analysis- develop logical writing skills to write essays on literary topics- to develop them in literary debate.*

**Unit – I Poetry**

W.B. Yeats: A Prayer For My Daughter
Dylan Thomas: The Hunchback in the Park
A.S. Housman: "The Carpenter's Son"

**Unit – II Poetry**

T.S. Eliot: The Love Song of J. Alfred Prufrock
W.H. Auden: The Unknown Citizen
Thom Gunn: Ted Hughes

**Unit – III Prose**

Sir James Jeans: Our Home in Space
J.B.S Haldane: The Scientific Point of View
Arnold Toynbee: "India's Contribution to world unity"

**Unit – IV Drama**

Synge: "The Playboy of the Western World"

**Unity – V Fiction**

Conrad: Lord Jim
Green: Heart of the Matter.

**BA ENGLISH LITERATURE**

**SEMESTER -V**
**CORE PAPER XII**
**INTRODUCTION TO LIETERARY CRITICISM**

**Hrs/week:5** **Code: U3EN5004** **Credits:4**

**Objectives:**

*To acquaint learners with Classical background- to familiarize learners with dramatic traditions.*

**Unit I:** CLASSICAL CRITICISM

The Classical background- A brief introduction to Plato, Aristotle, Longinus, and Horace
Aristotle's views on poetry and tragedy – key concept like mimesis, catharsis, Hamartia and anagnorises.

**Unit II:** MEDIEVAL AND RENAISSANCE CRITICISM
Sir Philip Sydney: Apology for Poetry (superiority of poetry over philosophy- objections to poetry and Sydney's answer)

**Unit III:** NEO CLASSICAL CRITICISM
John Dryden: An Essay of Dramatic Poesy (Dryden's defense of the English dramatic tradition – function of poetry – dramatic poetry)

**Unit IV:**
Alexander Pope: Essay on Criticism

**Unit V:**
Dr. Johnson: Preface to Shakespeare

**BA ENGLISH LITERATURE**

**SEMESTER –V ELECTIVEPAPER I**

**JOURNALISM**

**Hrs/week: 6** **Code: U3ENE501** **Credits: 5**

**Objectives:**
*To teach the learners how to expose serious misdemeanor- to teach health and safety – to prevent learners from being mislead by statement or action.*

**Unit I** a) Principles of Journalism

b) Social Responsibilities of the Press
c) Functional of the journalistic medium as a part of Mass communication

**Unit II** a) News: Introduction/Definition

b) Elements of News
c) The Inverted Pyramid style of news writing and the Five 'W' and One 'H

**Unit III**

a) Reporting, News value, human interest and story angle
b) Writing features, opinion- editorials, personal columns, reviews etc.,

**Unit IV**

a) Editorial Writing
b) Letters to the Editor
c) Art of interviewing, Crime reporting, Sports reporting

**Unit V**

A) Role of the Editor
B) Duties of the news Editor
C) Functions of the Sub-editor
D) Characteristics of a Reporter

Reference books

a) Rangaswami Parthasarthy- Basic Journalism, Macmillan Publishers, Chennai.
b) B.N. Ahuja: Theory and practice of journalism, Surjeeth publishers
a) Pathanjali Sethi- Professional Journalism, New Orient Longman, Bombay.

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**BA ENGLISH LITERATURE**
**SEMESTER V**
**SKILL BASED PAPER III**

**ENGLISH FOR COMPETITIVE EXAMINATIONS I**

**Hrs/week:4** **Code:U3ENSB51** **Credits: 3**

***Objectives:*** *To make student proficient in writing letters in the field of management, administration, and defense. To inculcate the values and ethics of e-mail.*

**Unit I**

Essay- Definition- Types of Essays

**Unit II**

Letter writing –personal- official- Business letters forms

**Unit III**

Expansion

**Unit IV**

Paraphrasing

**Unit V**

E-mails- Ethics- Do's and don'ts at the time of composing e-mails, e-mails structure

Reference books:

a) 'English for Competitive examination' by Rajul Bhargava, Macmillan publishers.
b) 'English for competitive examinations by V. Saraswathi ,Emerald Publishers.

**B.A.ENGLISH LIT.**

**SEMESTER- VI**
**CORE PAPER XIII**

**ENGLISH LANGUAGE TEACHING**

**Hrs/week: 5** **Code: U3EN6001** **Credits: 4**

***Objectives:***

*To develop reading, writing, listening and speaking skills-To classify the elements of English language-To enable the learner to use the grammar correctly-To teach how to design a lesson plan-To enable the learners to improve linguistic competence and communication-To enable the learner to acquire the skills to teach English.*

**Unit – I**

1. Objectives of teaching English
2. Bloom's Taxonomy of Educational Objectives

**Unit – II**

1. Interference and transfer from the mother tongue
2. Listening activities – dictation, following a route, listening to instructions, jigsaw listening.
3. Techniques in teaching speaking
4. Barriers of effective communication

**Unit – III**

1. Bilingual method
2. Direct method
3. The audio lingual method
4. Structural approach
5. Oral approach
6. Eclectic approach

**Unit – IV**

1. Using News media in ELT class room
2. Teaching English Intonation to ESL/EFL students

**Unit - V**

1. Planning and Design in Teaching and learning

2. Changing roles of a teacher

Reference books:1. English Language Teaching. Bhawana Misra. (Pub: Akansha Pub House, New Delhi)
2. English Language Teaching. Sharangare. (Pub: Swastik, Chennai)
3. English Language Teaching. Meenakshi Raman. (Pub: Atlantic, New Delhi)

**B.A.ENGLISH LIT.**

**SEMESTER-VI**
**CORE PAPER XIV**

**COMMONWEALTH LITERATURE**

**Hrs/week:5** **Code:U3EN6002** **Credits: 4**

*Objectives: To extend student's knowledge of literature from common wealth countries – to give training in research methods – to develop writing skills – to provide foundation knowledge of those who intending to proceed to an M.A.English.*

**Unit I:** Detailed poetry Derek Walcott- 'The Ruins of a Great House'

**Unit II**: Non-detailed poetry

a) David Rubadiri- A Negro Labourer in Liverpool
b) Margaret Atwood- Journey to the interior

**Unit III**: Drama

Wole Soyink- The lion and the jewel

**Unit IV**: Prose

Chiua Achebe- The Novelist as Teacher

**Unit V**: Novel

Margaret Atwood- Handmaid's Tale

Reference Books:

'An Anthology of commonwealth poetry', edited by C.D. Narasimhaiah, Macmillan Publishers, Chennai.

'Readings in commonwealth Literature', Edited by William Walsh, Oxford University Press, London.

**B.A.ENGLISH LIT.**

**SEMESTER-VI**
**CORE PAPER XV**

**20TH CENTURY LITERATURE II**

**Hrs/week: 5** **Code: U3EN6003** **Credits: 4**

**Objectives:**

*To achieve sense of the historical significance- to develop critical analysis- develop logical writing skills to write essays on literary topics- to develop them in literary debate.*

**Unit-I** Poetry

W.H. Auden : The Unknown Citizen

D.H. Lawrence: Snake

**Unit-II** : Poetry

T.S. Elliot: Journey of the Magi

Thomas Hardy: The Darkling Thrown

**Unit-III**: Prose

W.R. Inge: Spoon Feeding

Aldous Huxley: Selected Snobberies

**Unit-IV**: Drama

Galsworthy: Silverbox

**Unit-V**: Fiction

Kinglsy Arms: Lucky Jim

Referemce Books:

Nine Modern Poets, Ed. Black. Macmillan

**B.A.ENGLISH LIT.**

**SEMESTER-VI**
**CORE PAPER XVI**
**SOFT SKILLS**

**Hrs/week:5** **Code: U3EN6004** **Credits: 4**

**Objectives:** *To realistic work and work experience – to teach to make appropriate and reasonable decisions – to educate learners about unproductive thinking and self-defeating behaviors.*

**Unit I:**

1. Work Experience
2. Positive work Ethics.

**Unit II:**

1. Reporting to work on time
2. Good personal appearance
3. Wanting to do good job
4. Flexibility

**Unit III:**

1. Safety in work place
2. Safety rules
3. Good references
4. Good work history

**Unit IV:**
Interview Skills – Types of interviews : Group Interview, Panel and Telephone Interviews
**Unit V:**
Leadership Quality
Traits of leadership: Honesty, Integrity, Dedication, Responsibility, Goal setting and Decision making.

Reference Books: Essential Job Skills. T.Ravidran. Pub. Oxford University Press.

Soft Skills. S. Hariharan. MJP Publishers.

**B.A.ENGLISH LIT.**

**SEMESTER VI**
**ELECTIVE PAPER II**
**WRITTEN COMMUNICATION**

**Hrs/week:6** **Code:U3ENE601** **Credits: 6**

**Objective:** *To make the learners communicate messages with clarity and social commitment- Effective social and personal communication – documentation of writing in work place- creative writing in different spheres.*

**Unit I:**

Communication by letter

**Unit II:**

Different ways of presenting information

**Unit III:**

Description and Narration

**Unit IV:**

Note-Taking

**Unit V:**

Reporting

Reference book: Written Communication in English. Sarah Freeman, Orient Longman.

**B.A.ENGLISH LIT.**

**SEMESTER VI**
**SKILL BASED PAPER IV**
**ENGLISH FOR COMPETITIVE EXAMINATIONS II**

**Hrs/week: 4** **Code:U3ENESB61** **Credits:3**

**Objectives:** *To make student proficient in reading and reasoning in the field of management, administration, and defense. To inculcate the values of dedication in understanding socio-economic and national issues.*

**Unit I**

Reading and reasoning

**Unit II**

Use of particular words

**Unit III**

Use of Idioms and Expression

**Unit IV**

Use of Phrases/ slang, expression, Corporate English Jargon.

**Unit V**

General KnowledgeReference Books; English for competitive Examinations by Rajul Bhargava, Macmillan publishers.

English for Competitive examinations by Saraswathi, Emerald publishers

# *DEPARTMENT OF MATHEMATICS*

## SEMESTER V

**Paper IX** **ALGEBRAIC STRUCTURES** **U3MS5001**

**Objectives :** *This course aims to impart emphasis on concepts and technology of the groups and rings at these algebraic structures have applications in Mathematical physics, Mathematical Chemistry and Computer Science.*

**UNIT – I: GROUP THEORY**

Definition of a Group – Examples – Subgroups.

Chapter 2: Sections 2.1 to 2.4.

**UNIT – II : GROUPS**

Counting Principle – Normal Subgroups – Homomorphisms.

Chapter 2: Sections 2.5 to 2.7 (Omit Applications 1 and 2 of Section 2.7).

**UNIT – III : GROUPS**

Automorphisms – Cayley's theorem – Permutation Groups.

Chapter 2: Sections 2.8 to 2.10.

**UNIT – IV : RING THEORY**

Definition and Examples – Integral Domain – Homomorphism of Rings – Ideal and Quotient Rings.

Chapter 3: Sections 3.1 to 3.4.

**UNIT – V : RINGS**

Prime Ideal and Maximal Ideal – The Field of Quotients of an Integral Domain – Euclidean Rings.

Capter 3: Sections 3.5 to 3.7.

**RECOMMENDED TEXT:**

TOPICS IN ALGEBRA,*I.N.Herstein* (1989), 2nd Edn, Wiley Eastern Ltd., New Delhi.

**REFERENCES:**


1. MODERN ALGEBRA, *S. Arumugam*, (2004), Scitech Publications, Chennai.
2. MODERN ALGEBRA,*M.L.Santiago*, (2002), Tata McGraw Hill, New Delhi.
3. MODERN ALGEBRA,*Surjeet Singh and QaziZameeruddin*, (1982), Vikas Publishing House Pvt. Ltd., New Delhi.

**Paper - X** **REAL ANALYSIS**
**U3MS5002**

**Objectives:** *To understand various limiting behavior of sequences and series. To explore the various limiting processes viz. continuity, uniform continuity, connectedness, completeness and compactness and to enhance the mathematical maturity and to work comfortably with concepts.*

**UNIT-I: COUNTABILITY AND SEQUENCES**

Equivalence–Countability–Definition of Sequence and Subsequence– Limit of a Sequence – Convergent Sequences –Divergent Sequences –Bounded Sequences –Monotone Sequences – Cauchy Sequence.

Chapter 1: Section 1.5.

Chapter 2: Sections 2.1 to 2.6 and 2.10 only.

**UNIT-II: SERIES**

Convergence and Divergence–Series with non-negative terms–Alternating Series–Conditional Convergence and Absolute Convergence –Tests for Absolute Convergence.

Chapter 3 : Sections 3.1 to 3.4 and 3.6 (omit 3.5,3.7).

**UNIT-III: METRIC SPACES AND CONTINUOUS FUNCTIONS ON METRIC SPACES**

Metric Spaces – Limits in Metric Spaces – Functions Continuous at a point on the real line – Open Sets – Closed Sets.

Chapter 4: Sections 4.2 and 4.3(omit 4.1).

Chapter 5: Sections 5.1,5.4 and 5.5 (omit 5.2,5.3 and5.6).

**UNIT-IV: CONNECTEDNESS AND COMPLETENESS**

Open Sets–Connected Sets–Bounded Sets and Totally Bounded Sets–Complete Metric Spaces.

Chapter 6: Sections6.1 to 6.4.

**UNIT-V: COMPACTNESS**

Compact Metric Space–Continuous Functions on Compact Metric Spaces– Continuity of Inverse Functions –Uniform Continuity.

Chapter 6: Sections6.5 to 6.8

**RECOMMENDED TEXT:**

METHODS OF REAL ANALYSIS, Richard *R.Goldberg*, (2000), Oxford &IBH Publishing Co., New Delhi.

**REFERENCE BOOKS:**


1. MATHAMATICAL ANALYSIS, *Tom M.Apostol*, (1974), 2nd Edition, Addison –Wesley, New York.
2. REAL ANALYSIS,*R.G. Bertle and Shebert*,(1976), John Wiley and Sons,New York.
3. MATHEMATICAL ANALYSIS, *S.C. Malik and SavitaArora*, (1991), Wiley Eastern Limited, New Delhi.
4. INTRODUCTION TO REAL ANALYSIS, *Sanjay Arora and BansiLal*, (1991), SatyaPrakashan, New Delhi.


**Paper-XI** **STATICS**
**U3MS5003**

**Objectives:** *This course introduces the students to the basic concepts of forces, moments, couple, friction laws, virtual displacement and work, catenary and the centre of gravity and kinematics. This course stress the development of skill in formation of suitable mathematical models and problem solving techniques.*

**UNIT - I: PARALLEL FORCES AND MOMENTS**

Resultant of parallel forces, Moment of a forces, Varignon's theorem of moments, Moment of forces about an axis, Simple problems.

Chapter 2: Sections1,2,3,4,5,7,8,9.

Chapter 3: Sections 1,2,3,5,7,12.

**UNIT - II: COUPLES**

Couples, Equilibrium of two couples, Equivalences of two couples, Resultant of coplanar couples, Simple problems.

Chapter 4: Sections 1,2,3,6.

**UNIT - III:EQUILIBRIUM OF THREE FORCES ACTING ON A RIGID BODY**

Rigid body subject to any three forces, Three coplanar forces, Conditions of equilibrium, Two trigonometric theorems, Simple problems.

Chapter 5: Sections 1,2,3,5.

**UNIT - IV: FRICTION**

Statical, Dynamical and Limiting friction, Laws of friction, Coefficient of friction, Angle of friction, Cone of friction, Equilibrium of a particle on a rough inclined plane, Equilibrium of a body on a rough inclined plane under a force parallel to the plane, Equilibrium of a body on a rough inclined plane under any force, Simple problems.

Chapter 7: Sections 3,4,6,7,8,10,11, 12.

**UNIT - V: CENTRE OF GRAVITY**

The centre of gravity of a body is unique, C.G of a thin uniform rod, C.G of a thin plate, C.G of a thin uniform triangular lamina, C.G of a quadrilateral lamina.

**CENTRE OF GRAVITY BY INTEGRATION:**

C.G of a uniform circular arc subtending an angle $2\alpha$ at the centre, C.G of a uniform sector of a circle $2\alpha$ being the central angle, C.G of a uniform solid hemi sphere, C.G of a uniform hollow hemisphere, Simple problems.

Chapter 8: Sections 3,5,6,8,12,18.1,18.2,18.3,18.4.

**RECOMMENDED TEXT :**

STATICS, *Dr. M.K.Venkataraman,* Agasthiar Publication.

**REFERENCE BOOK:**

MECHANICS, *P.Duraipandian, LaxmiDuraipandian and MuthamizhJayapragasam,* S.Chand&Company Ltd.

**Paper - XII OPERATIONS RESEARCH– I U3MS5004**

**Objectives:** *To improve the skill of solving very common problem which one come across in various fields like transportation, game and industries with machines.*

**UNIT – I**

Linear programming problem – Mathematical formulation of the problem – Graphical solution method – Simplex method – Simplex Algorithm.

Chapter 2: Sections 2.1 – 2.9.

**UNIT – II**

Transportation problem– Mathematical formulation – The transportation table –The transportation Algorithm – Degeneracy in Transportation.

Chapter 3: Sections 3.1 – 3.5.

**UNIT – III**

The Assignment problem – The assignment algorithm – Maximization Assignment problem.

Chapter 4: Sections 4.1 – 4.5.

**UNIT – IV**

Game theory – Two person zero sum game –The MaxiMin and MiniMax principle – Saddle points – Game without saddle points.

Chapter 9: Sections 9.11 – 9.18, 9.21.

**UNIT – V**

Simulation – Applications – Advantages and Disadvantages– Monte Carlo method.

Chapter 13: Sections 13.1 – 13.7.

**RECOMMENDED TEXT:**

OPERATIONS RESEARCH, *P.K. Gupta and D.S. Hira*, (1998),S. Chand& Co.,New Delhi.

**REFERENCES:**


1. PROBLEM IN OPERATION RESEARCH,*KantiSwaroop, P.K. Gupta and Manmohan*,(2002), Sultan Chand & Son.
2. OPERATION RESEARCH, *H.A. Taha*, (2003), Macmillan Publishing Company, New York.
3. OPERATION RESEARCH,*V.K. Kapoor*, (1989), Sultan Chand & Sons.
4. PROBLEM IN OPERATION RESEARCH, *P.K. Gupta and D.S. Hira*, (2000), S. Chand& Co.,New Delhi.


**ELECTIVE PAPER – I : GRAPH THEORY U3MSE501**

**Objectives:** *To study and develop the concepts of graphs, sub graphs, trees, connectivity, Eulerian and Hamiltonian graphs, planar graphs.*

**UNIT- I**

Graphs, sub graphs, Degree of a vertex, Isomorphism of graphs, independent sets and coverings.

Chapter 2 : Sections 2.1 to 2.6.

**UNIT – II**

Adjacency and incidence of matrices, Operations on graphs, degree sequences, graphic sequences, walks, trails, paths.

Chapter 2 : Sections 2.8 to 2.9.

Chapter 3 : Sections 3.1 to 3.2.

Chapter 4 : Section 4.1

**UNIT - III**

Connectedness and components, cut point, bridge, block, Connectivity theorems and simple problems.

Chapter 4 : Sections 4.2 to 4.4

**UNIT - IV**

Eulerian graphs and Hamiltonian graphs, simple problems; trees, theorems and simple problems.

Chapter 5 : Sections 5.1 to 5.2

Chapter 6 : Sections 6.1 to 6.2

**UNIT – V**

Planarity; definition and properties, Characterization of planar graph, Thickness, Crossing, and Outer planarity.

Chapter 8 : Sections 8.1 to 8.3

**RECOMMENDED TEXT:**

INVITATION TO GRAPH THEORY, *S.Arumugam and S.Ramachandran*,2011, SCITECH Publications India Pvt Ltd.,Chennai-17.

**REFERENCE BOOKS:**

GRAPH THEORY,*S. Kumaravelu, SusheelaKumaravelu*,Publishers, Nagerkoil.
A FIRST COURSE IN GRAPH THEORY,*S.A.Choudham,* Macmillan India Ltd.
INTRODUCTION TO GRAPH THEORY,*Robin J. Wilson,* Longman Group Ltd.
GRAPH THEORY WITH APPLICATIONS,*J.A Bondy and U.S.R. Murthy*, Macmillan, London.

**ELECTIVE PRACTICAL**

**MS OFFICE PRACTICAL U3MSEP51**

**List of programs in MS Powerpoint:**

1. Presentation of simple mathematical concepts.
2. Presentation using animation.
3. Presentation with audio effects.
4. Presentation using videos.
5. Presentation including links.

**REFERENCE BOOK:**

MS OFFICE MANUAL

## SKILL BASED SUBJECT III

**PAPER - III QUANTITATIVE APTITUDE U3MSSB51**

**Objective:** *To introduce concept of mathematics with emphasis on analytical ability and computational skill needed in competitive examinations.*

### UNIT - I :PROBLEM ON GENERAL ARITHMETIC

Ratio and proportion – Inverse ratio - Properties ( Addendo, Subtrahendo, Componendo & Dividendo) - Ratio of Four numbers – increasing and decreasing order of fractions.

### UNIT – II : PERCENTAGE

Percentage – Gain and loss percentage – Partnership problem

### UNIT – III : TIME, DISTANCE AND WORK

Problem on speed, time and distance and work - Application to train, boat, tank filling and direction problems and on completion of work.

### UNIT – IV : SEQUENCE AND SERIES

General sequences and series – A.P and G.P - $n^{th}$ term – summations of series – determination of series in A.P & G.P.

### UNIT – V : SIMPLE INTEREST AND COMPOUND INTEREST

Simple & compound interest – Effective rate of interest - Annuity - Present value – Future value - Problems on R.D and installments.

### RECOMMENDED TEXT:

QUANTITATIVE APTITUDE, *R.S. Agarwal*, 2008, S. Chand & Co., New Delhi.

### REFERENCES:


1. QUANTITATIVE APPTITUDE FOR COMPETITIVE EXAMINATIONS, Abhigit Guha, Tata McGraw - Hill Pub., Co., Ltd. New Delhi. Third Edition
2. QUANTITATIVE APPTITUDE FOR COMPETITIVE EXAMINATIONS COURSE IN METAL ABILITIES, Edgar Thorpe Tata McGraw - Hill Pub., Co., Ltd. New Delhi. Third Edition

**SEMESTER VI**

**Paper - XIII** **LINEAR ALGEBRA** **U3MS6001**

**Objectives :***To study the Algebraic Structures of Vector Spaces and Linear Transformation.*

**UNIT - I : VECTOR SPACES**

Definition and Examples – Linear dependence and Independence.

Chapter 4: Sections 4.1 – 4.2.

**UNIT - II : VECTOR SPACES**

Dual Spaces – Inner Product Spaces.

Chapter 4: Sections 4.3 – 4.4.

**UNIT - III : LINEAR TRANSFORMATIONS**

Algebra of Linear Transformation – Characteristic roots.

Chapter 6: Sections 6.1 – 6.2.

**UNIT - IV : LINEAR TRANSFORMATIONS**

Matrices – Canonical forms – Triangular forms.

Chapter 6: Sections 6.3 – 6.4.

**UNIT - V : LINEAR TRANSFORMATIONS**

Trace and Transpose.

Chapter 6: Section 6.8.

**RECOMMENDED TEXT:**

TOPICS IN ALGEBRA,*I.N.Herstein* (1989), 2nd Edn, Wiley Eastern Ltd., New Delhi.

**REFERENCES:**


1. MODERN ALGEBRA, *S. Arumugam*, (2004), Scitech Publications, Chennai.
2. MODERN ALGEBRA,*M.L.Santiago*, (2002), Tata McGraw Hill, New Delhi.
3. MODERN ALGEBRA,*Surjeet Singh and QaziZameeruddin*, (1982), Vikas Publishing House Pvt. Ltd., New Delhi.

**Paper -XIV** **COMPLEX ANALYSIS**
**U3MS6002**

**Objectives:** *This course providesa modern treatment of concepts and techniques of complex function theory and the methods to solve problems in pure and applied mathematics.*

**UNIT – I**

Complex Numbers – Definition – Polar form – Exponential form – Powers and Roots.

Analytic Functions**:** Functions of a complex variable – Mappings – Limits, Continuity – Derivatives and Differentiation formula – Cauchy-Riemann Equations – Sufficient conditions for AnalyticFunctions – Harmonic Functions – Determination of Harmonic Conjugate and Analytic Function.

Chapter 1 : Sections 1, 5, 6, 7.

Chapter 2 : Sections 9, 10, 11, 14, 15, 16, 17, 18, 19, 20.

**UNIT – II: MAPPINGS BY ELEMENTARY FUNCTIONS**

Conformal Mapping – The transformations $w = az+b$, $w = \frac{1}{z}$, $w = z^2$, $w = \sqrt{z}$, $w = e^z$, $w = \sin z$, $w = \cos z$ – Bilinear Transformations.

Chapter 7 : Sections 64, 65, 66, 68, 69, 70, 71.

**UNIT – III: INTEGRALS**

Contours – Line Integrals – Cauchy-Goursat Theorem (without proof) - Cauchy's Integral Formula – Derivatives of Analytic Functions – Maximum Modulus Theorem.

Chapter 4 : Sections 31, 35, 39, 40, 42.

**UNIT – IV :SERIES**

Taylor's and Laurent's Theorem – Classification of Singularities – Simple problems.

Chapter 5 : Sections 45, 47, 48.

**UNIT – V :RESIDUES AND POLES**

Residues - Cauchy's Residue Theorem – Simple Problems – Evaluation of real improper integrals, improper integrals involving Sines and Cosines.

Chapter 6 : Sections 53, 56, 54, 58, 59.

**RECOMMENDED TEXT:**

COMPLEX VARIABLES AND APPLICATIONS, *R.V Churchill and J.W Brown*, (1990), McGraw Hill International Book Co.,Singapore.

**REFERENCE BOOKS :**


1. COMPLEX ANALYSIS, *P. Duraipandian & Laxmi Duraipandian*, (1976), Emerald Publishers, Chennai.
2. FOUNDATIONS OF COMPLEX ANALYSIS,*S.Ponnusamy*, (2000), Narosa Publishing House, New Delhi.


**Paper-XV** **DYNAMICS**
**U3MS6003**

**Objectives:** *This course aims to provide models for some real life problems. The students specializes in topics like Simple Harmonic motion, Projectiles, Central Orbits and Moment of inertia. Focus on the mathematical formulation of the physical aspects of the problems. It develops logical deduction and interpretation.*

**UNIT - I: LAWS OF MOTION**

Momentum, Newton's Laws of motion, Distinction between Mass and Weight, Conservation of Linear Momentum, Work, Power, Energy, Kinetic Energy, Potential energy, The principle of conservation of energy, The principle of energy in the case of a freely falling body, Simple problems.

Chapter IV : Sections 4.2,4.3,4.10,4.11,4.24,4.30 – 4.36.

**UNIT - II: PROJECTILES**

Definitions, The path of a projectile is a parabola, Characteristics of the motion of a projectile, Maximum horizontal range for a given velocity, Range on an inclined plane, Simple problems.

Chapter VI : Sections 6.2,6.4,6.5,6.12.

**UNIT – III : IMPACT**

Impulse, Impulsive force, Impact of two bodies,Fundamental Laws of impact, Direct impact of two smooth spheres, Oblique impact of two smooth spheres, Simple problems.

Chapter VII : Sections 7.1 – 7.4.

Chapter VIII : Sections 8.5, 8.7.

**UNIT – IV : SIMPLE HARMONIC MOTION**

Simple Harmonic Motion in a Straight line, General solution of the S.H.M equation, Change of origin, Two S.H.M of the same period and in the same straight line, Two S.H.M of the same period in two perpendicular directions, Simple problems.

Chapter X : Sections 10.2,10.3,10.5,10.6,10.7.

**UNIT – V : MOMENT OF INERTIA**

Definition, Theorem of Parallel axes, Theorem of Perpendicular axes, Moment of inertia in some particular cases, Simple problems.

Chapter XII : Sections 12.1 – 12.4

**RECOMMENDED TEXT** :

DYNAMICS, *Dr. M.K. Venkataraman,* Agasthiar Publication.

**REFERENCE BOOK:**

MECHANICS, *P.Duraipandian, Laxmi Duraipandian and Muthamizh Jayapragasam,*

S.Chand&Company Ltd**.**

**Paper- XVI OPERATIONS RESEARCH-II U3MS6004**

**Objectives:***To develop computational skills and logical thinking in formulating industry oriented problems as mathematical problems and finding solutions to these problems.*

**UNIT – I**

Replacement problems – Introduction – replacement of items that deteriorate with time – replacement of items that fail completely.

Chapter 11 : Sections 11.1, 11.2, 11.2.1,11.2.2,11.3

**UNIT – II**

Network scheduling by CPM/PERT – project network diagram – Critical Path Method (CPM) – PERT Computations.

Chapter 15 : Sections 15.1 to 15.6

Chapter 16 : Sections 16.1 to 16.4

**UNIT – III**

Sequencing problem –n jobs through 2 machines, n jobs through 3 machines – two jobs through m machines – (Graphical Method) – n jobs through m machines.

Chapter 5 : Sections 5.1 to 5.5

**UNIT – IV**

Queuing Theory – Basic concepts – Steady state analysis of M/M/1 and M/M/N systems with finite and infinite capacities.

Chapter 10 : Sections 10.1 to 10.6 , 10.6.1 to 10.6.3, 10.6.7 and 10.7

**UNIT – V**

Inventory models – EOQ model (a) Uniform demand rate infinite production rate with no shortages (b) Uniform demand rate finite production rate with no shortages – Inventory control with Price Breaks. Chapter 12 : Sections 12.1 to 12.7.

**RECOMMENDED TEXT:**

OPERATIONS RESEARCH, *P.K. Gupta and D.S. Hira* (1998),S. Chand & Co., New Delhi.

**REFERENCE BOOKS:**


1. OPERATIONS RESEARCH : THEORY AND APPLICATIONS,*J.K.Sharma*, (1998) Macmillan, New Delhi.
2. PROBLEMS IN OPERATION RESEARCH,*Kanti Swaroop, P .K. Gupta Manmohan*, (2002), Sultan Chand & Sons.
3. OPERATIONS RESEARCH,*A.Ravindran,D.T. Philips and J.J. Solberg* ,(1987),John Wiley & Sons, New York.
4. OPERATIONS RESEARCH,*H.A. Taha*, (2003), Macmillan Publishing Company, New York.
5. OPERATIONS RESEARCH,*P.R. Vittal*,(2003), Margham Publications, Chennai.
6. OPERATIONS RESEARCH,*S.J.Venkatesan*,J.S. Publishers, Cheyyar.


**ELECTIVE PAPER II**

**PROGRAMMING LANGUAGE C++: THEORY**

**U3MSE601**

**Objectives :** *This courses introduces a higher level programming language C++ .*

**UNIT - I**

Principles of OOP – Beginning with C++ .
Chapters : 1 – 2.

**UNIT - II**

Functions in C++ – Tokens, Expressions and Control Structures.
Chapters : 4 – 5.

**UNIT - III**

Constructors and destructors – Operator Overloading and Type Conversions.
Chapters : 6 – 7.

**UNIT - IV**

Inheritance : Extending Classes – Pointers.
Chapter : 8.

**UNIT - V**

Virtual Functions and Polymorphism.
Chapter : 9.

**RECOMMENDED TEXT:**

*OBJECT ORIENTED PROGRAMMING WITH* C++, *E. Balagurusamy*, 1999, Tata McGraw Hill, New Delhi.

**REFERENCES:**

PROGRAMMING WITH C++,*D. Ravichandran*, 1996, Tata McGraw Hill, New Delhi.

**ELECTIVE PRACTICAL - II**

**ROGRAMMING LANGUAGE C++ PRACTICAL**

**U3MSEP61**

**(RECORD : 15 Marks + ESE : 60 Marks ) = 75 Marks**

1. Prime numbers between two given numbers.
2. First N Fibonacci numbers.
3. Addition of matrices.
4. Ascending and descending orders in a given array.
5. Computing the power of a number.
6. Basic arithmetic operations.
7. Number of vowels and consonants in a string.
8. Solving quadratic equations.
9. Swapping two given strings.
10. Sorting techniques.

**SKILL BASED SUBJECT IV**

## COMPUTATIONAL METHODS

**U3MSSB61**

**Objectives:** *To introduce concepts of mathematics with emphasis on analytical ability and computational skill needed in competitive examinations.*

### UNIT – I : LINEAR EQUATION

Formation and solution of linear equations with one variable - Simultaneous equation with two and three variables - Application to division of a number.

### UNIT- II : PERMUTATIONS AND COMBINATIONS

Definitions of nPr, nCr – Relationship between them – Circular permutation.

### UNIT - III : AVERAGES

Changes in Values and in Averages – Combining Two or More groups – Important notes – Weighted Average Deviations method.

### UNIT - IV : GEOMETRY

Angles and lines – Intersecting lines – Parallel lines – Triangles – Geometric points of a Triangles – Congruency of Triangles – Quadrilaterals – Trapezium – Parallelogram – Rhombus.

### UNIT - V : FUNTIONS, GRAPHS AND TRIGNOMETRY

Even and Odd functions – Graphs of some standard functions – Trigonometric ratios in a right-angled triangle – Values of Trigonometric functions of some standard angles – Height and Distance.

### RECOMMENDED TEXT:

QUANTITATIVE APTITUDE, *R.S. Agarwal*, 2008, S. Chand & Co., New Delhi.

### REFERENCE BOOKS:


1. QUANTITATIVE APTITUDE FOR COMPETITIVE EXAMINATIONS, *Abhigit Guha*, Third Edition, Tata McGraw – Hill Pub.Co. Ltd., New Delhi.
2. COURSE IN MENTAL ABILITIES AND QUANTITATIVE APPTITUDE FOR COMPETITIVE EXAMINATIONS, *Edgar Thorpe*, Second Edition, Tata McGraw - Hill Pub. Co. Ltd., New Delhi.
3. QUANTITATIVE APTITUDE FOR COMPETITIVE EXAMINATIONS, *Trishna's*,Second Edn, Pearson Education Pub. Co. Ltd., New Delhi.

# *DEPARTMENT OF PHYSICS*

## SEMSTER V- PAPER V- ELECTRICITY AND MAGNETISM

## SUB. CODE: U3PY5001

### UNIT I - ELECTROSTATICS

Coulomb's law – Electric intensity and potential – Relation between electric intensity and potential –Potential at a point due to a uniformly charged conducting sphere- Electric dipole – Potential and intensity due to a dipole – Electrical images – Electric intensity and potential due to an earthed conducting plane applying the principle of electrical images – Capacity –Energy of a charged capacitor – Loss of energy due to sharing of charges- Problems in capacitor.

### UNIT II - MAGNETIC EFFECT OF ELECTRIC CURRENT

Magnetic field around a current carrying conductor – Biot and Savart law – Magnetic field intensity at a point on the axis of a circular coil carrying current – Magnetic field intensity due to a solenoid carrying current – Moving coil galvanometer – Moving coil ballistic galvanometer – Theory - Damping correction – Determination of the absolute capacity of a condenser using BG.

### UNIT III - ELECTROMAGNETIC INDUCTION*

Faraday's laws of electromagnetic induction – Lenz's law – Self Induction- Expression for self inductance of a coil- Determination of self-inductance of a coil using Rayleigh's method – Mutual inductance – Expression for mutual inductance- Experimental determination of absolute mutual inductance – Coefficient of coupling – Earth inductor and uses .

### UNIT IV - DC AND AC CIRCUITS*

Growth and decay of current in a circuit containing resistance and inductance – Growth and decay of charge in a circuit containing resistance and capacitor – Growth and decay of charge in a LCR circuit – Condition for the discharge to be oscillatory- Problems in DC circuits.

Peak, average and RMS values of AC voltage and current – Power factor and current values in an AC circuit containing LCR – series and parallel resonant circuits – Wattless current.

**UNIT V – MAXWELL'S EQUATIONS AND ELECTROMAGNETIC THEORY**

Susceptibility – permeability – Intensity of Magnetization – Relation $B=\mu_0(\mathbf{H}+\mathbf{I_m})$ – Properties of dia , para and ferromagnetism- Langevins theory of dia and paramagnetism – Domain theory of ferromagnetism – Hysteresis curves – Displacement current – Maxwell's equations – Maxwell's equation in free space – Expression for velocity of electromagnetic wave in free space .

**Books for Study**

1. Duggal and Chhabra, Electricity and Magnetism. (Publisher)
2. M. Narayanamurthy and N. Nagarathnam, Electricity and Magnetism 5th Edition National Publishing Co. Meerut.
3. R. Murugeshan – Electricity and Magnetism 9th Edition 2009 S. Chand and Co. New Delhi.
4. Brijlal N. Subramanyan and Jivan Seshan Electricity and Magnetism, Eurasia Publishing House (Pvt) Ltd, New Delhi.

**Books for Reference**

1. Sehgal D.L. Chopra K.L. sehgal NK – Electricity and Magnetism, Sultan Chand and Sons, New Delhi.
2. David J. Griffiths Introduction to Electrodynamics 2nd Edition 1997 Prentice Hall of India Pvt. Ltd. New Delhi.
3. Electricity and Magnetism by K.K. Tewari S. Chand and 3rd Edition 2001.

*Compulsory problem in Section B

## SEMESTER V - PAPER VI - ATOMIC PHYSICS

## SUBJECT CODE; U3PY5002

### UNIT I - EFFECT OF ELECTROMAGNETIC FIELD ON PARTICLES

Moving of a charge in transverse electric and magnetic fields – Specific charge of electrons – Dunnington's and Magnetron Method –Positive rays –Thomson parabola method –Aston's and Dempster's mass spectrograph.

### UNIT II - ATOMIC STUCTURE

Vector atom model - Pauli's Exclusion Principle –Explanation of Periodic Table- Various Quantum numbers –Angular Momentum and magnetic moment-coupling schemes-LS and JJ coupling – Spatial Quantisation- Bohr Magneton-Stern and Gerlach experiment.

Spectral terms and notations –Selection rule – Intensity rule and Interval rule-Fine Structure of sodium D lines- Alkali Spectrum- Fine structure of alkali Spectra –Spectrum of Helium.

### UNIT III - IONISATION POTENTIAL AND SPLITTING OF ENERGY LEVELS

Excitation and ionisation potentials –Davis and Goucher's method –Zeeman Effect-Larmor's theorem –Debye's explanation of normal Zeeman effect- Anomalous Zeeman effect –Theoretical Explanation –Lande's 'g' factor and explanation of splitting of $D_1$and $D_2$ lines of sodium –Paschen Back Effect – theory –Stark effect (qualitative treatments only)

### UNIT (IV) PARTICLE PROPERTIES OF WAVES

Dual nature of particle -Polarization of X-rays-Scattering of X-rays (Thomson`s formula)-Determination of the number of electrons per atom- Failure of classical mechanics [(i)The hydrogen and Bohr model (ii) Black body radiation (iii) Photoelectric effect (iv) Compton effect (v) The heat capacity of solids].

### UNIT (V) X-rays

Introduction- Production of X-rays-Absorption of X-rays-Bragg law-Derivation –Bragg X-ray spectrometer-determination of crystal structure (i) The Laue method (ii) Rotating

crystal method (iii)The powder crystal method-X-rays spectra-characteristics of X-ray spectrum-Moseley`s law (statement, explanation and importance)

**Books for Study**

1. Modern Physics by R. Murugeshan, S Chand &Co., New Delhi-2004
2. Atomic and Nuclear Physics by N.Subramanian and Brij Lal, S Chand &Co., New Delhi-2004
3. Atomic Physics by J.B. Rajam (edition-publisher)

**Books for Reference**

1. Atomic Physics by A.B. Gupta and Dipak Ghosh - Books and Allied publishers
2. Modern Physics by J.H. Hamilton and yang, McGraw Hill publication 1996
3. Concepts of Modern Physics by A. Beiser, Tata McGraw hill, new Delhi 1997
4. Fundamentals of Physics, $6^{th}$ edition, by D. Halliday, R. Resnick and Walker, Wiley NY 2001

## SEMESTER V – PAPER VII -APPLIED ELECTRONICS

## SUBJECT CODE; U3PY5003

**UNIT I**

**SEMICONDUCTOR THEORY ***

Classification of materials based on energy band theory- properties of semiconductors- intrinsic and extrinsic semiconductor- Junction Diode-Bridge rectifier-voltage regulator- Transistor construction– Working- characteristics in CE and CB mode

**UNIT II**

**AMPLIFIERS AND OSCILLATORS**

Single Stage RC coupled amplifier- frequency response – Voltage gain of a feedback amplifier – Barkhausen criterion –Oscillators – LC Oscillators- Hartley Oscillator and Colpitt's Oscillator - RC Oscillators – Phase Shift Oscillator and Wien's bridge Oscillator.

**UNIT III**

**WAVESHAPING CIRCUITS AND MULTIVIBRATORS***

Types of wave shaping circuits- Clipping (Positive, negative and biased) - Clamping circuits (Positive and negative) –RC timing circuits-diffrentiator and integrator-Multivibrators – Astable, Mono stable and Bi-stable Multivibrators using transistor.

**UNIT IV**

**SEMICONDUCTOR DEVICES AND ITS APPLICATIONS**

FET – Characteristics – parameters – MOSFET – Depletion and enhancement – UJT characteristics– UJT relaxation oscillator — SCR characteristics – SCR as half wave rectifier and full wave rectifier- SCR as static current switch – DIAC – TRIAC-Dimmer .

**UNIT V**

**RADIO COMMUNICATION**

Communication – Modulation –Need for modulation - Amplitude Modulation – Frequency Modulation – Phase Modulation – AM Transmitter -AM detector –FM Transmitter- FM discriminator – Superhetrodyne receiver.

**Books for study**

1.Basic Electronics by B.L.Theraja, S. Chand &Co.
2.A text book in Electrical Technology-BL Theraja, S Chand &Co.
3."Physics of semiconductor devices" by S.M. Sze, (John Wiley, New York, 1982).
4."High speed semiconductor devices" by S.M. Sze (John Wiley, New York, 1996).

**Books for Reference**

1.Integrated Electronics by Tauband Schilling Mc Graw Hill.
2."Physics and Technology of semiconductors' by S.M. Sze (John Wiley, New York, 1990)

*Compulsory problem in Section B

## SEMESTER V – DIGITAL ELECTRONICS

## SUBJECT CODE; U3PYE501

**Unit I**

**Number systems and Codes: Logic Families:**

Decimal, binary, octal and hexadecimal systems – Conversion from one code to another - Binary arithmetic – Binary addition – subtraction – multiplication – division - 1's and 2's complements - BCD Codes – 8421 code

**Logic gates and Logic Families:**

AND, OR circuits using diodes and transistor – NOT using transistor – NAND, NOR and EXOR – functions and truth tables – NAND & NOR as universal gates – Logic families – RTL NOR – DTL NAND – TTL NAND – ECL OR/NOR – CMOS logic – CMOS Inverter – CMOS – NAND and NOR.

**Unit-II**

**Simplification of logic circuits:**

Boolean algebra – Simplifications of logic equations using Boolean algebra - De Morgan's theorems and their circuit implementations - Karnaugh map – pairs, quads, octets – 2,3 and 4 variables - Sum of product – Product of Sums – NAND-NAND network – NOR-NOR network

**Combinational Circuits:**

Arithmetic circuits – Half adder – Full adder – Half subtractor – Full subtractor- Multiplexer – Demultiplexer – Encoder – Decoder – BCD to Seven Segments Decoder

**Unit-III**

**Sequential logic circuits:**

Flip-flops – RS Flip-flop – clocked RS Flip-flop – D Flip-flop – JK Flip-flop – JK master slave Flip-flop - T Flip-flop

**Shift registers and Counters:**

Serial in-serial out – serial in-parallel out – parallel in-serial out – parallel in-parallel out – Asynchronous/Ripple counter - up down counter – Synchronous counter – decade counter

**Unit-IV**

**Memory Devices:**

Read only memory – PROM – EPROM – EEPROM – Random access memory – Static RAM – Dynamic RAM – Memory expansion Memory parameters/characteristics

**Unit-V**

**Timers:**
555-Timer internal structure – Astable, monostable operations – Schmitt trigger
**D/A and A/D converters:**
Binary Weighted Resistor D/A converter – R-2R Ladder D/A converter – Successive Approximation A/D converter – Dual Slope A/D converter.

**Books for study**

1. Digital Principles and Applications-A.P. Malvino, McGraw Hill International Editions (Fourth Edition)
2. Modern Digital Electronics- R.P.Jain, Tata McGraw Hill Pub. Company (Fourth Edition)
3. Digital Fundamentals-Thomas L. Floyd, Universal Book Stall
4. Introduction to Integrated Electronics-V.Vijayendran, Viswanathan Pub.Chennai.
5. Fundamentals of digital computers- Arul Thalapapathi, Comptek Publishers, Chennai

**Book for Reference**

1. Digital Electronics with Practical Approach- G.N Shinde, Shivani Pub. Nanded
2. Digital electronics: An Introduction to Theory and Practice – William H. Gothmann, Prentice Hall of India.
3. Digital Integrated electronics- Herbert Taub and Donald Schilling, Mc. Hraw Hill.
4. Fundametal of Digital electronics and Microprocessors, 2 nd revised and enlarged edn.- Anokh Singh and A. K Chhabra, S Chand& Co, Ltd., New Delhi

## SEMESTER V- SKILL BASED SUBJECT III

## BASIC TELEVISION MAINTENANCE & TROUBLESHOOTING

## SUBJECT CODE; U3PYSB51

### UNIT-I

Pin identification and testing method of active and passive components used in Television circuit – Printed circuit board (PCB) – Servicing technique of PCB – Servicing instruments – Digital Multimeter – Cathode Ray Oscilloscope – Video pattern generator.

### UNIT-II

Low voltage power supply – Switch Mode Power Supply (SMPS) – Repairing procedure of low voltage and SMPS power supply - Block diagram of monochrome TV receiver – Common Section – Video Section - Deflection Section - Sound Section – Signal flow diagram.

### UNIT-III

Monochrome Picture tube construction and working principle – Control circuit of a Picture Tube – Screen Phosphor - Precaution in handling Picture Tube – Common faults in Picture Tube – Horizontal and Vertical Scanning – Simple and Interlaced Scanning – Composite Video Signal – Blanking pulses – Equalizing pulses.

### UNIT-IV

Colour picture Tube: Principle, construction and working – Adjustments for Colour Picture Tube - Compatibility – Three Colour Theory – Mixing of Colours – Luminance Signal (Y) - Production of Colour Difference Signal – NTSC Colour TV System – PAL colour TV System.

### UNIT-V

Television Antenna – Resonance antennas and their Characteristics – Antenna Parameters – Yagi-Uda Antenna and Design – RF Tuner - Function and various Blocks of VHF Tuner – UHF Tuner – Booster Amplifier

**Books for Study:**

1. Modern Television Practice - R.R. Gulati, New Age International (P) Limited, Publishers, New Delhi.
2. Television Engineering and Video Systems Second Edition - RG Gupta, Tata McGraw Hill Education Private Limited New Delhi.
3. Television and Video Engineering – J Rangarajan, Charulatha Publications, Chennai.

**Books for Reference:**

1. Basic television theory & Servicing – Paul B Zbar, petter W One, Tata McGraw Hill Education Private Limited New Delhi.
2. Modern television circuit – S.K Gupta, BPB Publication, New Delhi

## SEMESTER V – MAIN PRACTICAL V

## SUBJECT CODE; U3PYPR51

1. Young's modulus – Koenig's method – non uniform bending
2. Newton's rings – $R_1$, $R_2$ and $\mu$ of a convex lens
3. Spectrometer i –i′ curve
4. Spectrometer - Dispersive power of a prism
5. Potentiometer – calibration of high range voltmeter
6. Potentiometer – Conversion of galvanometer into a voltmeter
7. BG – Figure of merit – Charge and voltage sensitiveness
8. Construction of Dual Power Supply
9. Transistor characteristics – CE mode
10. Hartley oscillator
11. Colpitt's oscillator

## ELECTIVE PRACTICAL –I
## DIGITAL ELECTRONICS PRACTICAL
## SUBJECT CODE; U3PYEP51

1. Logic gates using Discrete components
2. NAND as Universal gate
3. NOR as Universal gate
4. Karnaugh map reduction and logic circuit implementation
5. Verification of Demorgan`s theorems
6. Half Adder and Full Adder.
7. Half Subtractor And Full Subtractor
8. 4-Bit Binary Counter
9. BCD Counter.
10. Four bit Shift Register

## SEMSTER VI- PAPER VIII- NUCLEAR AND PARTICLE PHYSICS

## SUBJECT CODE; U3PY6001

### UNIT – I

### NUCLEAR STRUCTURE

Introduction - Isobars, Isotopes – Nuclear mass and binding energy – Nuclear spin – Parity – Mass defect and Packing fraction –Binding Energy curve – Nuclear size – Nuclear magnetic moment – Determination of nuclear magnetic moment: Rabi's method – Proton-electron hypothesis – Proton-neutron hypothesis – nuclear forces – Meson theory of nuclear forces – Electric quadrupole moment – Nuclear energy levels.

### UNIT- II

### RADIOACTIVITY AND NUCLEAR DECAY*

Basic ideas of Natural Radioactivity –Determination of e/m of alpha particles – Range and stopping power of alpha particles –Gamow's theory of alpha decay - Geiger - Nuttal law – Beta ray spectrum – Neutrino theory of beta decay – Electron capture – gamma rays – Determination of wavelength by Dumond crystal spectrometer – Nuclear isomerism.

**UNIT- III**

**PARTICLE ACCELERATORS, DETECTORS AND NEUTRON**

Cyclotron – Synchrocyclotron – Betatron – Electron synchrotron – Proton synchrotron (Bevatron) – GM counter –Scintillation counter – Nuclear emulsion technique -Neutron – Discovery - sources and detection - classification of neutrons – mass, half-life and magnetic moment.

**UNIT - IV**

**NUCLEAR MODELS, FISSION AND FUSION***

Liquid drop model – Semi empirical mass formula – shell model.

Nuclear Fission – Bohr-Wheeler's theory of compound nucleus –Nuclear chain reaction – Nuclear reactor – Four factor formula – Thermal Reactor (BWR) and Fast Breeder Reactor - Nuclear fusion – Thermonuclear reactions.

**UNIT –V**

**COSMIC RAYS AND ELEMENTARY PARTICLES**

Cosmic Rays – Nature of cosmic rays – Cosmic Ray showers – Particles discovered – Effect of earth's magnetic fields – Van Allen Belt – Elementary Particles – Discovery – classification of elementary particles – Bosons – Fermions – Hadrons and Leptons – Particles and anti-particles – Fundamental interactions – Conservation laws – CPT theorem – Quarks types- Quarks model of nucleus.

**Books for Study and Reference**

1. A.B. Gupta and Dipak Ghosh, Atomic and Nuclear Physics – Books and Allied, (P) Ltd Calcutta.

2. R. Murugeshan S. Chand Publications.

3. K. Gopala Krishnan, Atomic and Nuclear Physics , Macmillian.

*Compulsory problem in Section B

## SEMSTER VI- PAPER IX

## QUANTUM MECHANICS & MATHEMATICAL PHYSICS

## [SUB. CODE-U3PY6002]

### UNIT I - WAVE MECHANICS

Matter waves – de Broglie wavelength – Construction of wave packet - Wave velocity and group velocity – Heisenberg's Uncertainty principle – proof of Uncertainty principle for one dimensional wave packet – Postulates of wave mechanics – operator formalism – Eigen functions – Eigen values – expectation values- Properties of wave functions.

### UNIT II - SCHROEDINGER EQUATIONS AND ITS APPLICATIONS

Schroedinger equation – time dependent and time independent - application of Schrodinger equations – linear harmonic oscillator – zero point energy – Particle in a one and three dimensional box – Barrier penetration and tunneling effect – Hydrogen atom.

### UNIT III - MATRICES

Definitions – Symmetric, Skew symmetric, Hermitian & skew Hermitian matrix – Matrix multiplication – Properties – Inverse of a matrix – Solution of simultaneous equations.

Linear equations – Characteristics equation and roots or Eigen values – Cayley – Hamilton theorem – Inverse of matrix using Cayley Hamilton theorem.

### UNIT IV – VECTOR ANALYSIS

Product of the two vector- scalar or dot product- vector or cross product- work done by a force- vector moment or torque of a force- Definition of grad, div and curl- Line integral- surface integral – volume integral- Gauss- Divergence theorem- Stoke's theorem- Green's theorem ( All the three statement and proof)

### UNIT V - SPECIAL FUNCTIONS AND DIFFERENTIAL EQUATIONS

Beta and gamma functions – problems – Relation between beta and gamma functions – Bessel's differential equations – Legendre's differential equations – Hermite's differential equations – Laguerre's differential equations – series solutions – Dirac delta functions – Properties.

**Books for Study**

1. Quantum Mechanics by V.Devanathan, Narosa, Chennai,2005
2. Modern physics by Murugan, Kiruthiga, sivaprasath S Chand & Co[2007]
3. Quantum Mechanics by V K Thangappan,Willey Eastern
4. A Text Book of Quantum Mechanics by P M Mathews and Venkatesan, McGraw Hill
5. Mathematics Physics by Sathya Prakash
6. Mechanics and Mathematical methods By Murugeshan,S Chand Publishing & Co
7. Mathematical Physics by H.K.Dass, S.Chand Copmpany, New DELHI,

**Books for Reference**

1. Mathematical Physics by B D Gupta
2. Quantum Mechanics by Ghatak and Loganathan,McMillan
3. Basic quantum mechanics by A Ghatak, McMillan India [2002]

## SEMSTER VI- ELECTIVE II- NUMERICAL METHODS AND FUNDAMENTALS OF "C"

## SUBJECT CODE; U3PY6003

### UNIT I - SIMULTANIOUS LINEAR ALGEBRAIC EQUATIONS

Gauss elimination method – Gauss- Jordan method –Gauss- Siedel - Gauss Jacobi – Interaction method- Computation of inverse of a matrix using Gauss elimination method – Eigen values and Eigen vectors

### UNIT II - NUMERICAL DIFFERENTIATION AND INTEGRATION

Numerical integration by Trapezoidal and Simpson 1/3 and 3/8 rules – Romberg's method –Double integration using trapezoidal and Simpson's rules –Runge – Kutta method for solving first and second order equations.

### UNIT III- INTERPOLATION AND APPROXIMATION

Lagrange's interpolation formula for unequal intervals- Lagrange's Inverse interpolation formula- Newton's Divided Difference formula- Newton's Forward interpolation formula- Newton's Backward interpolation formula.

**UNIT IV - C FUNDAMENTALS**

C fundamentals –character set – identifiers and keywords - data types – constant variable –declaration – expression –statement –arithmetic, relational, logical, assignment, conditional and common operators- library functions.

**UNIT V – SIMPLE PROGRAMS**

Data input/output functions- simple C programs (addition, subtraction, multiplication and comparison) – flow of control –control structure, break and continue, go to statement.

**Books for Study and Reference:**


1. Venkatraman M.K (1977) Numerical methods in Science and Engineering, national publishing company- Chennai.
2. Shastry SS Introductory methods of numerical methods – Prentice Hall Ltd
3. Sankara Rao K Numerical methods for Scientist and engineers 3rd edition Print ail Hall of India Privati Ltd
4. Veerarsan. T and Ramachandran T,Numerical methods with Programming in C Tata Mc Gran Hall publishing Co Ltd
5. E.Balagurusamy, Programming in C
6. Yashwant Kanithkar, Let us C


**SEMESTER VI- SKILL BASED SUBJECT IV**

**DIGITAL TELEVISION MAINTENANCE AND TROUBLESHOOTING**

**SUBJECT CODE; U3PYSB61**

**UNIT-I**

Remote Control - Types of Remote Control – Block diagram of Remote Control Transmitter used in a TV – Block Diagram and Description of Remote Control Receiver - Remote control Troubleshooting – TV Games Circuits

**UNIT-II**

Video Compact Disc (VCD) – Block diagram of VCD Player - Digital Video Disc (DVD) – Block diagram of DVD Player - Troubleshooting – Application of DVDs –

Features and Outputs of DVD Players – BLU-RAY Disc – Block diagram and Description of Blu-Ray Disc player.

**UNIT-III**

Digital Satellite Receiver – Block diagram and description of digital satellite receiver – Digital colour TV Receiver – Block diagram and function of various sections Digital Colour TV Receiver – Troubleshooting – Application of Digital TV Receiver.

**UNIT-IV**

Principle of Stereo sound - Stereo sound in TV – Principle of 3D Transmission – Block diagram and Description of 3D TV Receiver – 3D Display method - Plasma colour TV Receiver – LCD Colour TV Receiver – Comparison of Plasma and LCD Television – LED Colour TV Receiver

**UNIT-V**

Cable TV – Signal Sources for Cable TV – Block diagram and description of Front End Converter - Cable Signal Processing Unit – LCD Projectors – Digital Light Processing Projector (DLP)

**Books for Study:**


1. Modern Television Practice - R.R. Gulati, New Age International (P) Limited, Publishers, New Delhi.
2. Television Engineering and Video Systems Second Edition - RG Gupta, Tata McGraw Hill Education Private Limited New Delhi.
3. Television and Video Engineering – J Rangarajan, Charulatha Publications, Chennai.


**Books for Reference:**


1. Basic television theory & Servicing – Paul B Zbar, petter W One, Tata McGraw Hill Education Private Limited New Delhi.
2. Modern television circuit – S.K Gupta, BPB Publication, New Delhi

**SEMESTER VI – ELECTIVE PAPER III –**
**MICROPROCESSOR AND ITS APPLICATIONS – 8085**
**SUBJECT CODE; U3PYE601**

**UNIT – I**

**Microprocessor architecture and its operations**

Microprocessors – Architecture of 8085 – pin out configurations of 8085 – Bus organization and timings: buses – buffer – address bus, data bus, multiplexing address/data bus and control & status signals – ALU – registers in 8085 – flags– 8085 interrupts – interrupt priorities.

**UNIT –II**

**Programming model of 8085**

Classification of instructions and format – 8-bit data transfer, arithmetic, logical and branch instructions – Addressing modes –16 bit data transfer and memory related instructions – stack and subroutine instructions- comparison of stack and subroutine instructions – Logical rotate and compare instructions – RIM and SIM interrupt instructions – static and dynamic debugging of a program.

**UNIT – III**

**Time delay, design of counters and memory interface**

Counters – time delay using one and pair of registers – resetting and displaying flags of 8085- Instruction timings of 8085 –T-states – delay routines and delay calculations.

Memory interface: 2K X 8, 4K x 16 ROM and RAM interface – timing diagram for memory read and memory write cycles- instructions cycle, machine cycle.

**UNIT – IV**

**Interfacing I/O devices**

Interfacing concepts – peripheral I/O instructions – interfacing input and output using decoders – interface of LED output display for binary data –Memory mapped I/O –LED display of binary data – comparison of peripheral I/O and memory mapped I/O – Direct memory access (DMA).

**UNIT – V**

**Interfacing data converters and peripheral devices**

Concepts of Interfacing - interfacing of programmable peripheral device 8255 - illustration of interfacing of 8-bit D/A and successive approximation A/D converters – programming 8255A MODE zero- interfacing with A/D converter in BSR mode .

**BOOK FOR STUDY:**

1. Microprocessor Architecture, Programming and applications with the 8085 – R.S. Goankar, 3rd Edn. Prentice Hall.
2. Fundamental of Microprocessor – 8085 – Architecture, programming and interfacing – V. Vijayendra, S. Viswanathan, Pvt., Ltd. 2003.

**BOOKS FOR REFERENCE:**

1. Digital computer electronics: an introduction to microcomputers – Malvino, 2nd Edn., Tata McGraw Hill.
2. Fundamentals of Microprocessors and microcomputers – B. Ram.
1. Computer system architecture – Moris Mano, 3rd Edn., Prentice Hall India.
2. Introduction to microprocessors: software, hardware, programming – Lance A. Leventha, Prentice Hall India.

**SEMESTER VI – MAIN PRACTICAL VI**

**SUBJECT CODE; U3PYPR61**

1. Young's modulus – Koenig's method – uniform bending
2. Spectrometer - Dispersive power of a grating
3. Spectrometer – Cauchy's constant
4. Spectrometer – narrow angled prism – angle of deviation – normal incidence and normal emergence – refractive index.
5. Potentiometer – emf of a thermocouple
6. Potentiometer – Conversion of galvanometer into an ammeter.
7. Field along the axis of circular coil – deflection magnetometer – m and $B_H$
8. BG – comparison of capacitances and emf of a cell
9. BG – absolute capacitance of a capacitor
10. Single stage RC Coupled Amplifier-Frequency response
11. FET Characteristics
12. UJT Characteristics
13. UJT Relaxation Oscillator

## SEMESTER VI – ELECTIVE PRACTICAL II

## MICROPROCESSOR 8085-PRACTICAL

## SUBJECT CODE; U3PYEP61

1. 8 Bit Addition
2. 8 Bit Subtraction
3. 8 Bit Multiplication
4. 8 Bit Division
5. BCD TO HEXA Decimal Code Conversion
6. ASCII TO Decimal Conversion
7. Generation Of Time Delay
8. Sum Of Arithmatic Progression
9. Ramp Wave Form Generation
10. Square Wave Form Generation

# *DEPARTMENT OF CHEMISTRY*

SEMESTER V

**CORE PAPER IX**

**STEREO CHEMISTRY & REACTION MECHANISM**

U3CH5001
5 HOURS/WEEK
CREDITS: 4

***Objective:***

1. *To effectively impart knowledge about Carbohydrate chemistry, Stereochemistry, Heterocyclic chemistry, polynuclear hydrocarbons and dyes.*
2. *To make the students more inquisitive in learning the mechanistic details in Organic Chemistry through the teaching of the named reactions*
3. *To learn the synthetic applications of certain organic compounds*
4. *To explore to use multimedia tools in organic structural analysis.*

**UNIT- I** **15 HOURS**

1.1. Carbohydrates : classifications - reactions of glucose and fructose - osazone formation, muta rotation and its mechanism – structural elucidation of glucose and fructose - pyranose and furanose forms.

1.2 Determination of ring size - Haworth projection formula - configuration of glucose and fructose - epimerization – chain lengthening and chain shortening of aldoses - inter conversion of aldoses and ketoses

1.3 Disaccharides and poly saccharides: reactions and Structural elucidation of sucrose and maltose. Structural elucidation and properties of cellulose

**UNIT- II** **15 HOURS**

2.1 Stereoisomerism : definition - classification into optical and geometrical isomerism. Projection formulae : Fischer, Flying Wedge, Sawhorse and Newmann projection formulae - rotation of optical isomers - Cahn - Ingold - Prelog rules - D, L notations R, S notation of optical isomers with one and two asymmetric carbon atoms - Optical activities in compounds not containing asymmetric carbon atoms : biphenyls, allenes and spiranes

2.2. Geometrical isomerism : cis - trans, syn - anti and E, Z notations - geometrical isomerism in maleic and fumaric acids and unsymmetrical ketoximes - methods of distinguishing geometrical isomers using melting points, dipole moment, solubility, dehydration, cyclisation, heat of hydrogenation and combustion.

2.3 Conformational analysis : introduction of terms - conformers, configuration, dihedral angle, torsional strain, conformational analysis of ethane and n-butane including energy diagrams - conformers of cyclohexane - axial and equitorial bonds - ring flipping - conformers of mono and dimethylcyclohexane -1,2 and 1,3 interactions – use of multimedia tools in conformation analysis.

**UNIT- III** **15 HOURS**

3.1 Carbonyl polarization - reactivity of carbonyl group - acidity of alpha hydrogen; Malonic, acetoacetic and cyano acetic esters - Characteristic reactions of active methylene group - synthetic uses of malonic, acetoacetic and cyano acetic esters.

3.2. Tautomerism: definition - keto-enol tautomerism - identification, acid and base catalyzed mechanisms, evidences - amido-imidol, nitro- acinitro tautomerisms

3.3 Diazo methane and diazo acetic ester - preparations, structure and synthetic uses.

**UNIT- IV** **15 HOURS**

4.1 Heterocyclic compounds - Huckel's rule - Preparation, properties and uses of furan, pyrrole, and thiophene.

4.2 Preparation, properties and uses of, pyridine and piperidine. Methods of opening of heterocyclic rings - oxidation, reduction, Hoffman's exhaustive methylation, Van Braun's methods. Comparative study of basicity of pyrrole, pyridine and piperidine with amines.

4.3 Synthesis and reactions of quinoline, isoquinoline and indole with special reference to Skraup, Bischler Napieralskii and Fischer Indole syntheses

**UNIT- V** **15 HOURS**

5.1 polynuclear hydrocarbons - synthesis, properties and uses of naphthalene, anthracene and phenanthrene - structural elucidation of naphthalene - chemistry of naphthaquinones.

5.2 Dyes - Theory of colour and constitution - classification according to the structure and method of application. Preparation and uses of 1) Azo dye - methyl orange 2) Triphenyl methane dye - Malachite green 3) Phthalein dye - phenolphthalein and flourescein 4) Vat dye - Indigo 5) anthraquinione dye – Alizarin

5.3 Mechanism of aldol, Perkin and benzoin condensations Knoevenagel, Claisen, Wittig, Cannizzaro, Reformatsky and Michael reactions.

***Reference Books:***


1. Organic Chemistry - R. T. Morrison and Boyd - Pearson Education
2. Organic Chemistry - I. L Finar - Volume I and II - Pearson Education
3. Text Book of Organic Chemistry - P.L.Soni - Sultan Chand
4. Advanced Organic Chemistry - Bahl and Arun Bahl - S. Chand
5. Stereochemistry, conformations and mechanisms - Kalsi - New Age
6. Organic Chemistry of Natural Products - Volume I and II- O.P. Agarwal – GOEL Publishing House
7. A guide book to mechanism in Organic Chemistry - Peter Skyes – Pearson Education
8. Stereo Chemistry of Organic Compounds - D. Nasipuri - New Age
9. Chemistry of Natural Products - Gurdeep Chatwal- Himalaya Publishing House
10. Reactions and Reagents - O.P. Agarwal- GOEL Publishing House
11. Organic reaction mechanisms - Gurdeep Chatwal- Himalaya Publishing House
12. A text book of Organic Chemistry K.S.Tewari,N.K.Vishol,S.N.Mehrotra- Vikas Publishing House
13. Organic Chemistry- M.K.Jain and S.C.Sharma-Shoban Lal and Nagin Chand
14. Reaction, Mechanism and Structure- Jerry March- John Wiley and Sons
15. Organic Chemistry – Bruice - Pearson Education
16. Organic Reaction and Mechanism by Ahluwalia.

**V SEMESTER**

## CORE PAPER X
## SOLUTIONS & KINETICS

U3CH5002
5 HOURS/WEEK
CREDITS: 4

***Objectives***

1. *To study about the solutions and colligative properties*
2. *To know about Chemical Equilibrium.*
3. *To study phase rule.*
4. *To promote interest in surface chemistry, catalysis & chemical kinetics.*

**UNIT-I** **15 HOURS**

1.1 Solutions of gases in liquids - Henry's law - solution of liquids in liquids - Raoult's law - vapour pressure of ideal solutions - activity of a component in an ideal solution - Thermodynamics of ideal solutions – Free energy change of mixing for an ideal solution - volume change and enthalpy changes of an ideal solution - vapour pressures of real or non-ideal solutions - vapour pressure - composition and Boiling point- composition curves of completely miscible binary solutions- Fractional distillation of binary liquid solutions.

1.2 Azeotropic mixtures - Distillation of immiscible liquids - solubility of partially miscible liquids - phenol water system - CST and effect of impurities on CST.

**UNIT-II: Colligate properties and chemical equilibrium** **15 HOURS**

2.1 Lowering of vapour pressure - osmosis and osmotic pressure - relation between osmotic pressure and vapour pressure lowering of an ideal solution - theories of semipermeability - reverse osmosis - elevation of boiling point - depression of freezing point - derivations and determination – vant Hoff factor.

2.2 Chemical equilibrium: law of mass action - law of Chemical equilibrium- thermodynamic derivation of law of Chemical equilibrium – Vant Hoff reaction isotherm - standard free energy change - and its relation with equilibrium constant - temperature dependence of equilibrium constants - Vant Hoff isochore - Le Chatelier principle.

**UNIT-III : Phase Equilibria** **15 HOURS**

3.1 Gibb's phase rule - statement and definition of terms - Application to one component systems - Water and sulphur system - Reduced phase rule - Two component systems - simple eutectic system - lead - silver system - Freezing mixtures .

3.2 Thermal analysis and cooling curves - compound formation with congruent melting point - Zn-Mg system, Ferric chloride - water system – compound formation with incongruent melting point Na-K system

**UNIT- IV : Surface Chemistry** **15 HOURS**

4.1 Adsorption - Physisorption and Chemisorptions - Applications of adsorption - Adsorption of gases by solids - Freundlich adsorption isotherm - Langmuir's theory of adsorption - BET theory of multilayer adsorption - determination of surface area - adsorption isotherms.

4.2. General characteristics of catalytic reactions, Acid-base catalysis- Enzyme catalysis Mechanism and kinetics of enzyme catalyzed reactions - Michaelis-Menten equation - Effect of temperature on enzyme catalysis - Heterogeneous catalysis - Surface reactions-kinetics of surface reactions.

**UNIT-V: Chemical Kinetics** **15 HOURS**

5.1 The rate equation - order & molecularity of a reaction - first order reactions - second order reactions - third order reactions - zero order reactions – Half life time of a reaction - methods of determining order of a reaction – order and molecularity of simple reactions - experimental methods in the study of kinetics of reaction -

volumetry, manometry, polarimetry , and colorimetry - effect of temperature on reaction rates - concept of activation energy - energy barrier -Effect of catalyst.

5.2 Collision theory and derivation of rate constant for bimolecular reactions - theory of absolute reaction rates - thermodynamic derivation for the rate constant for a bimolecular reaction from it - comparison of collision theory and ARRT - significance of entropy , enthalpy and free energy of activation.

***Reference Books:***


1. Principles of physical chemistry - B.R. Puri and Sharma - shobanlal nagin Chand & Co.,
2. Text Book of physical chemistry - P.L. Soni - Sultan Chand.
3. Physical chemistry - Negi and Anand - New Age.
4. Physical chemistry - Kundu and Jain - S. Chand.
5. Physical chemistry - K.L kapoor - Macmillan - 4 volumes
6. Elements of physical chemistry - Glasstone and Lewis - Macmillan.
7. Text book of physical chemistry - S.Glasstone, Macmilan.
8. Fundamentals of physical chemistry - maron and Landor - Colier - Macmillan.
9. Physical chemistry - G.W. Castellan - Narosa publishing house.
10. Physical chemistry - Walter J. Moore - Orient Longman.
11. Numerical problems on physical chemistry Gashal, Books and Allied (P) Ltd.,
12. Universal General Chemistry, C.N.R. Rao, Macmillan.
13. Group theory and its chemical applications - P.K.Bhattacharya – Himalaya publishing House.

SEMESTER V

**PAPER IV (Elective 1)**

**COORDINATION CHEMISTRY & ANALYTICAL CHEMISTRY**

U3CHE501
5 HOURS/WEEK
CREDITS: 4

***Objectives :***

1. *To understand the principle of gravimetry.*
2. *To give students a firm grounding in coordination chemistry.*
3. *To study about the halogens and related compounds.*
4. *To explore the use of You-tube lectures and online tools.*

**UNIT-I : 15 HOURS**

1.1 Principles of gravimetric analysis - Characteristics of precipitating agents - choice of precipitants - conditions of precipitation – specific and selective precipitants - DMG, cupferron, salicylaldehyde, ethylene diamine - use of sequestering agents - co-precipitation – post precipitation - differences - reduction of error - peptisation - precipitation from homogeneous solution - calculation in gravimetric methods - use of gravimetic factor.

1.2 Thermoanalytical methods - principles involved in thermogravimetic analysis and differential thermal analysis - characteristics of TGA and DTA - thermograms – factors affecting TGA and DTA curves - discussion of various components of the instrument with block diagrams - applications of thermogravimetry - applications of DTA – ($CaC_2O_4$. $2H_2O$ & $CuSO_4$. $5H_2O$) Thermometric titration. Electrogravimetry - principle and applications. You tube lectures on thermogravimetric analysis.

**UNIT-II: COORDINATION COMPOUNDS 15 HOURS**

2.1 Definition of terms used - classification of ligands - chelation and effect of chelation - applications of EDTA - coordination number and stereo chemistry of complexes - nomenclature. Detection and structure determination of complexes.

2.2 Bridged (or) polynuclear complexes - inter metallic complexes - Isomerism in complexes - ionisation isomerism, hydrate isomerism, linkage isomerism, ligand isomerism, coordination isomerism, polymerization isomerism, geometrical and optical isomerism in 4 and 6 co-ordinate complexes.

**UNIT-III : 15 HOURS**

3.1 Werner theory - EAN rule - theory of bonding - valence bond theory - hybridisation - geometry and magnetic properties - failure of VBT

3.2 Crystal field theory - spectrochemical series - splitting of d - orbitals in octahedral and tetrahedral complexes - crystal field stabilization energy - calculation of CFSE in octahedral and tetrahedral complexes.

3.3 Low spin and high spin complexes-explanation of magnetic properties, colour and geometry using CFT.

**UNIT-IV : 15 HOURS**

4.1 Comparison of VBT and CFT. Application of coordination compounds in qualitative and quantitative analysis - Detection of potassium ion, separation of Cu and Cd ions, Estimation of Ni using DMG and Al using oxine.

4.2 Pi-acceptor ligands - bonding, hybridisation, structures and properties of mono nuclear carbonyl complexes of Ni, Cr, Fe, Co & Mn - compounds of P and As as acceptor ligands.

**UNIT-V : 15 HOURS**

5.1 Halogens - comparative study of F, Cl, Br, and I - comparison of reactivity's F and O - exceptional properties of fluorine.

5.2 Oxy acids of halogens – preparation properties and its structure. Interhalogen compounds- pseudohalogens - basic properties of halogens- positive iodine – evidences.

***Reference Books:***


1. Inorganic chemistry - P.L. Soni - Sultan Chand (2006).
2. Inorganic chemistry - B.R. Puri, L.R. Sharma and K.C. Kallia – Vallabh Publications (2003).
3. Selected topics in inorganic chemistry - W.U. Malik, G.D. Tuli and R.D. Madan - S. Chand Publications (2003).

4. Inorganic chemistry - J.E. Huheey, Harper and Collins - NY IV edition (1993).
5. Concise Inorganic chemistry - J.D. Lee - III edition - Von Nostrand
6. Industrial chemistry - B.K Sharma - Goel Publications (1983).
7. Industrial chemistry R.K. Das - Kalyani Publications, New Delhi (1982).
8. Coordination chemistry - S.F.A. Kettle - ELBS (1973).
9. Coordination chemistry - K. Burger - Butterworthy (1973).
10. Vogel's handbook of quantitative inorganic enalysis - Longman.
11. Text book of qualitative inorganic analysis - A.I. Vogel - III edition (1976).
12. Source book on atomic energy - Van Nostrand Co., (1969).
13. Nuclear and radiochemistry - John wiley and sons (1964).
14. Nuclear chemistry - H.J. Arnikar - Wiley Eastern Co., - II edition (1987).
15. Advanced Inorganic chemistry - Cotton and Wilkinson - V Edition – Wiley and Sons (1988).

SEMESTER V

## SKILL BASED SUBJECT III

## PHARMACEUTICAL CHEMISATRY

U3CHSB51
5 HOURS/WEEK
CREDITS: 3

***Objective :***

1. *To effectively impart knowledge about - various diseases and their treatment.*
2. *To learn about the importance of Indian medicinal plants.*
3. *To know about the different types of drugs.*

**UNIT- I** **15 HOURS**

1.1 Definition of the following terms: drug, pharmachophore, pharmacology, pharmacopeia, bacteria, virus, chemotherapy and vaccine

1.2 Causes, symptoms and drug for jaundice, cholera, malaria and filaria. First aid for accidents - antidotes for poisoning.

**UNIT – II** **15 HOURS**

2.1 Causes, detection and control of anaemia and diabeties. Diagnostic test for sugar, salt and cholesterol in serum and urine.

2.2 Indian medicinal plants and uses-Tulsi, Neem, Kizhanelli, Mango, Semparuthi, Adadoda and Thoothvelai.

**UNIT- III** **15 HOURS**

3.1 Antibacterials: Sulpha drugs-examples and actions-protonsil, sulphathiazole, sulphafurazole Antibiotics-definition and action of penicillin, streptomycin, chloramphenicol, - SAR of chloramphenicol only.

3.2 Antiseptics and disinfectans - definition and distinction-phenolic compounds, chloro compounds, and cationic surfactants.

**UNIT IV** **15 HOURS**

4.1 Analgesics, Antipyretics and antiinflamatory agents: Definition and actions - narcotic and non narcotic- morphine and its derivatives, pethidine and methodone- salicylic derivative, paracetamol, ibuprofen – disadvantages and uses

4.2 Causes, and treatment of cancer - AIDS - AZT, (Azidothymidine) DDC (Di deoxy cytosine).

**UNIT V** **15 HOURS**

5.1. Anaesthetics - definition-local and general - volatile nitrous oxide, ether, Chloroform, cyclo propane- trichloroethylene - uses and disadvantages.

5.2 Drugs affecting CNS - Definition, distinction and examples for tranquilizers, sedatives, hypnotics, psychedelic drugs – LSD (Lysergic Acid) Hashish- their effects.

***Reference Books:***


1. A text book of Pharmaceutical chemistry - Jayashree Ghosh - S. Chand
2. Pharmaceutical Chemistry - S. Lakshmi Sultan Chand
3. Pharmacology and Pharmatherapeutics - R.S. Satoskar - popular prakashan - Vol.I and II.
4. Medicinal Chemistry - Asutosh Kar - New Age
5. A text book of Synthetic drugs - O.D. Tyagi - Ammol publications.
6. Introduction to biological chemistry _- J. Awapara prentice Hall

7. A text book of biochemistry - Ambika.S
8. Biochemistry - A.L.Lehinger
9. Essentials of biological chemistry - James Fanley - East West press

SEMESTER V

## CORE PRACTICAL XI
## GRAVIMETRIC ESTIMATION I

U3CHPR51
4 HOURS/WEEK
CREDITS: 3

***Objective:***

*To learn gravimetric estimation techniques.*

1. *Estimation of barium as barium sulphate.*
2. *Estimation of barium as barium chromate.*
3. *Estimation of lead as lead chromate.*
4. *Estimation of lead as lead sulphate*

***Marks Distribution: 75 marks***

| | |
|---|---|
| *1 .Record* | *10marks* |
| *2. Execution of work* | *35marks* |
| *3. Accuracy/ Result* | *25marks* |
| *4. Viva Voce* | *05marks* |

***Reference Books:***

1. Text books of Practical Inorganic Chemistry by Vogel.
2. Qualitative Inorganic Analysis by V.V. Ramanijam.

SEMESTER V

## CORE PRACTICAL XII
## (ORGANIC ANALYSIS)

U3CHPR52
3 HOURS/WEEK
CREDITS: 3

***Objective:***

1. *To understand the reactivity of the functional groups.*
2. *To learn the recrystallization techniques.*
3. *To gain firsthand knowledge by visiting industry.*

***I. Analysis of organic compounds containing one functional group and Characterization with a derivative.***

Reactions of the following functional groups:

- Carboxylic acid (mono and di),
- Phenol
- Ester
- Aldehyde
- Ketone
- Carbohydrates
- Primary Amine
- Amide
- Nitro compound
- Diamide
- Anilide

***Marks Distribution: 75 marks***

| | |
|---|---|
| *1 . Record* | *10marks* |
| *2. Procedure* | *15marks* |
| *3. Aliphatic / Aromatic* | *06marks* |
| *4. Saturated/Unsaturated* | *06marks* |
| *5. Element present/ absent* | *12marks* |
| *6. Functional Group* | *12marks* |
| *7. Derivative* | *09marks* |
| *8. Viva Voce* | *05marks* |

***Reference Books:***


1. Vogel's text book of chemical analysis.
2. Practical chemistry - A.O. Thomas - Scientific book center, Cannanore.

3. Practical chemistry-S. Sundaram - 3 Volumes - S. Viswanthan.
4. Vogel's text book of practical organic chemistry – Longmann.

SEMESTER V

## CORE PRACTICAL XIII

## KINETICS EXPERIMENTS

U3CHPR53
3 HOURS/WEEK
CREDITS: 3

***Objectives:***

*To study the kinetics of a reaction.*

1. *Study of Kinetics of first order reaction using hydrolysis of methyl acetate ester in the presence of acid used as a catalyst.*
2. *Determination of the transition temperature of the given salt hydrate. Na2 S2O3, 5 H2,O, CH3 COONa, 3H2O, SrCl2, 6H2O,MnCl2, 4H2O.*
3. *Determination of molecular weight of a given unknown solute by Rast's method using Naphthalene or Diphenyl as solvent.*
4. *a) Determination of cell constant using 0.1N and 0.01N KCl solution.*
   *b) Determination of equivalent conductance of two different strong electrolytes.*
5. *Determination of Concentration of a given unknown sodium chloride solution by using phenol sodium chloride system. (Effect of impurity).*

***Marks Distribution: 75 marks***

| | |
|---|---|
| *1. Record* | *10marks* |
| *2. Procedure* | *10marks* |
| *3. Viva Voce* | *05marks* |
| *4. Experiment* | *50marks (Expt. 25 + Manipulation 25)* |

***Reference Books:***

1. Basic principles of Practical chemistry by V. Venkatesaran.
2. Basic principles of Practical chemistry by R. Veeraswamy.
3. Basic principles of Practical chemistry by A.R. kulandaivelu.

SEMESTER VI

**CORE PAPER XIV**

**NUCLEAR CHEMISTRY & INDUSTRIAL CHEMISTRY**

U3CH6001
5 HOURS /WEEK
CREDITS: 4

***Objectives :***

1. *To impart knowledge about radioactivity and nuclear chemistry.*
2. *To understand the metallic bond and bio-inorganic chemistry.*
3. *To learn about f and d block elements.*
4. *To provide knowledge about the industrial chemistry.*

**UNIT-I :NUCLEAR CHEMISTRY 15 HOURS**

1.1 Introduction - composition of nucleus - nuclear forces operating between the nucleons - n/p ratio, curves, stability belts - the whole number rule and packing fraction - isotopes, isobars, isotones and isomers.

1.2 Nuclear binding energy - Mass defect - simple calculations involving mass defect and binding energy per nucleon - magic numbers - liquid drop model - shell model .

**UNIT-II : 15 HOURS**

2.1 Natural radioactivity - Detection and measurement of radioactivity - radioactive series including neptunium series - group displacement law - Rate of disintegration and half - life period - Average life period.

2.2 Artificial radioactivity - induced radioactivity - uses of radioisotopes - hazards of radiations - nuclear fission - nuclear energy - nuclear reactors - nuclear fusion - thermo nuclear reactions - energy source of the sun and stars.

**UNIT-III : 15 HOURS**

3.1 Metallic bond - theories - electron pool theory - valence bond theory - MO theory - semiconductors – Intrinsic and extrinsic and p type semiconductors.

3.2 Bioinorganic chemistry - Biological aspects of Fe, Zn, Mg, Co and Mo - Role of Na, K, Ca, and P - Biological functions and toxicity of some elements.

**UNIT-IV : 15 HOURS**

4.1 Chemistry of d block elements - characteristics of d block elements - variable valency - magnetic properties and colour - comparative study of Ti, V, Cr, Mn and Fe group metals - occurrence, oxidation states, magnetic properties and colour - preparation and uses of ammonium molybdate, $V_2O_5$ and $UF_6$

4.2 Chemistry of f block elements - comparative account of lanthanides and actinides, occurrence, elements, oxidation states, magnetic properties, colour and spectra - lanthanide contraction - causes, consequences and uses - comparison between 3d and 4f block elements - comparison between lanthanides and actinides.

**UNIT-V : 15 HOURS**

5.1 Industrial chemistry - Fuel gases - calorific value - composition and sources / formation of water gas, semi water gas, carburetted water gas, producer gas, oil gas, natural gas, LPG and bio gas (manufacture not required)

5.2 Composition and setting of cement - manufacture of cement - examples for pigments - constituents of paints and their functions - type of glasses - manufacture of glass.

***Reference Books:***


1. Inorganic chemistry - P.L. Soni - Sultan Chand (2006).
2. Inorganic chemistry - B.R. Puri, L.R. Sharma and K.C. Kallia – Vallabh Publications (2003).
3. Selected topics in inorganic chemistry - W.U. Malik, G.D. Tuli and R.D. Madan - S. Chand Publications (2003).
4. Inorganic chemistry - J.E. Huheey, Harper and Collins - NY IV edition (1993).
5. Concise Inorganic chemistry - J.D. Lee - III edition - Von Nostrand
6. Industrial chemistry - B.K Sharma - Goel Publications (1983).
7. Industrial chemistry R.K. Das - Kalyani Publications, New Delhi (1982).
8. Coordination chemistry - S.F.A. Kettle - ELBS (1973).
9. Coordination chemistry - K. Burger - Butterworthy (1973).
10. Vogel's handbook of quantitative inorganic enalysis - Longman.
11. Text book of qualitative inorganic analysis - A.I. Vogel - III edition (1976).
12. Source book on atomic energy - Van Nostrand Co., (1969).
13. Nuclear and radiochemistry - John wiley and sons (1964).

14. Nuclear chemistry - H.J. Arnikar - Wiley Eastern Co., - II edition (1987).

Advanced Inorganic chemistry - Cotton and Wilkinson - V Edition – Wiley and Sons (1988).

SEMESTER VI

**ELECTIVE PAPER II**

**NATURAL PRODUCTS & SPECTROSCOPIC ANALYSIS**

U3CHE601
5 HOURS/WEEK
CREDITS: 3

**Objectives:**

1. *To understand the basic concepts of organic photochemistry and Molecular Rearrangements.*
2. *To kindle interest in students in learning bio-organic chemistry through the introduction of topics such as Proteins, Nucleic acids, Terpenes, Alkaloids.*
3. *To assign the spectra using simple organic molecules.*

**UNIT- I** **15 HOURS**

1.1 Nucleic acids: Nucleoside, nucleotide, degradation of nucleotide chain - stucture of nucleic acids - RNA and DNA - elementary idea about protein synthesis

1.2 Synthesis of pyrimidine and purine bases - guanine, adenine, uracil, cytosine and thymine.

1.3 Terpenes - isoprene rule –structural elucidation of menthol and α terpeniol.

**UNIT- II** **15 HOURS**

2.1 Vitamins : Classification - structural elucidation of pyridoxine.

2.2 Antibiotics : Classification and structural elucidation of streptomycin.

2.3. Alkaloids : General methods of isolation and structural elucidation of piperine and nicotine

**UNIT-III** **15 HOURS**

3.1 Amino acids : Classification of amino acids - preparations and properties of alpha amino acids - with special reference to Gabriel phthalimide synthesis, Strecker synthesis, Erlenmeyer synthesis- zwitter ion , isoelectric point

3.2 Poly peptides and proteins:. Classification of proteins based on physical and chemical properties and physiological functions -peptide synthesis - Bergman synthesis.

3.3 Primary structure of proteins - end group analysis - Akabori method, reduction method, Edman method, Sanger's method, Dansyl method - secondary structure of protein - helical and sheet structures - denaturation of proteins.

**UNIT- IV** **15 HOURS**

4.1 UV, IR, NMR and Mass spectra basic principles. Spectral interpretation of simple organic molecules such as ethanol, benzaldehyde, 2-methyl propene, vinyl chloride, aniline, phenol, benzoic acid, and cinnamic acid.

**UNIT- V** **15 HOURS**

5.1 Organic photochemistry : Types of photochemical reactions- photo dissociation- gas phase photolysis - isomerisation- cyclisation- dimerisation and oxetane formation.

5.2 Norrish-I and II reactions. Barton reaction- photo - Fries rearrangement - photochemical formation of smog- photochemistry of vision.

5.3 Molecular rearrangements: Classification - anionotropic and cationotropic, inter molecular and intra molecular rearrangements .-Pinacol-pinocolone, Benzilic acid, Cope, oxy Cope, Beckmann, Hoffmann, Curtius, Baeyer-Villiger, Claisen (sigmatropic) and Fries (Two mechanisms) rearrangements.

***Reference Books :***


1. Organic Chemistry - R. T. Morrison and Boyd - Pearson Education
2. Organic Chemistry - I. L Finar - Volume I and II - Pearson Education
3. Text Book of Organic Chemistry - P.L.Soni - Sultan Chand
4. Advanced Organic Chemistry - Bahl and Arun Bahl - S. Chand
5. Stereochemistry, conformations and mechanisms - Kalsi - New Age
6. Organic Chemistry of Natural Products - Volume I and II- O.P. Agarwal – GOEL Publishing House

7. A guide book to mechanism in Organic Chemistry - Peter Skyes – Pearson Education
8. Stereo Chemistry of Organic Compounds - D. Nasipuri - New Age
9. Chemistry of Natural Products - Gurdeep Chatwal- Himalaya Publishing House
10. Reactions and Reagents - O.P. Agarwal- GOEL Publishing House
11. Organic reaction mechanisms - Gurdeep Chatwal- Himalaya Publishing House
12. A text book of Organic Chemistry K.S.Tewari,N.K.Vishol,S.N.Mehrotra-Vikas Publishing House
13. Organic Chemistry- M.K.Jain and S.C.Sharma-Shoban Lal and Nagin Chand
14. Reaction, Mechanism and Structure- Jerry March- John Wiley and Sons
15. Organic Chemistry - Bruice - Pearson Education

SEMESTER VI

## CORE PAPER XV

## ELECTRO CHEMISTY & PHOTO CHEMISTRY

U3CH6002
5 HOURS /WEEK
CREDITS: 4

**Objectives**

1. *To study photo chemistry and laser.*
2. *To learn about Electro chemistry and its applications.*

**UNIT- I** **15 HOURS**

1.1 Laws of photochemistry – Jablonski diagram - Non radiative transitions – IC – ISC – Radiative transitions - Fluorescence and phosphorescence - primary and secondary reactions - Kinetics of hydrogen - bromine reaction.

1.2 Photosynthesis- photosentisation - chemiluminescence - Lasers - uses of lasers.

**UNIT-II: Electrochemistry** **15 HOURS**

2.1 Introduction: Metallic and Electrolytic conductors – Specific – Equivalent - Molar Conductance – Variation of Specific and Equivalent conductance with dilution - Transport number and its determination by Hittorff's and moving boundary method - effect of temperature and concentration on ionic mobility and ionic conductance - Kohlrausch's law and its applications, salt hydrolysis and pH of a salt solution, buffer action and explanation

2.2 Applications of conductivity measurements - degree of hydrolysis, solubility product and conductometric titrations.

**UNIT-III** **15 HOURS**

3.1. Theory of strong electrolytes - Debye - Huckel - Onsager theory - verification of Onsager equation - Wein effect and Debye Falkenhagen effect - ionic strength - activity and activity coefficients of strong electrolytes.

3.2 Galvanic cells - reversible and irreversible electrodes and cells - standard cell - emf and its measurement - types of electrodes – Gas electrode – Metal Metal ion electrode – Metal Metal insoluble salt electrode – Redox electrode – Glass

electrode - electrode reactions - electrode potentials - reference electrodes - Standard electrode potentials. Derivation of Nernst equation for electrode potential and cell emf. - sign conventions.

**UNIT-IV** **15 HOURS**

4.1 Electrochemical series and its applications - formation of cells - electrode and cell reactions - cell emf - chemical cells and concentration cells with and without transference - examples and derivation of expressions for their emfs - liquid junction potential and its significance.

4.2 Applications of emf measurement - calculation of $\Delta G$, $\Delta H$, $\Delta S$ and equilibrium constant Determination of pH using quinhydrone and glass electrodes - potentiometric titrations.

**UNIT-V** **15 HOURS**

5.1 Polarization - decomposition potential over voltage - storage cells - lead acid battery - mechanism of discharging and recharging - fuel cells.

5.2 Polarography - principle - concentration polarization – dropping mercury electrode - advantages and disadvantages - convection, migration and diffusion currents - Ilkovic equation (derivation not required) and significance - current voltage curve - oxygen wave - polarography as an analytical tool in quantitative and qualitative analysis.

***Reference Books::***


1. Principles of physical chemistry - B.R. Puri and Sharma - shobanlal nagin Chand & Co.,
2. Text Book of physical chemistry - P.L. Soni - Sultan Chand.
3. Physical chemistry - Negi and Anand - New Age.
4. Physical chemistry - Kundu and Jain - S. Chand.
5. Physical chemistry - K.L kapoor - Macmillan - 4 volumes
6. Elements of physical chemistry - Glasstone and Lewis - Macmillan.
7. Text book of physical chemistry - S.Glasstone, Macmilan.
8. Fundamentals of physical chemistry - maron and Landor - Colier - Macmillan.
9. Physical chemistry - G.W. Castellan - Narosa publishing house.
10. Physical chemistry - Walter J. Moore - Orient Longman.

11. Numerical problems on physical chemistry Gashal, Books and Allied (P) Ltd.,
12. Universal General Chemistry, C.N.R. Rao, Macmillan.
13. Group theory and its chemical applications - P.K.Bhattacharya – Himalaya publishing House.

**SEMESTER VI**

## CORE PRACTICAL XVIII
## THERMOMETRIC & ELECTRIC EXPERIMENT

U3CHPR63
3 HOURS/WEEK
CREDITS: 3

***Objectives:***

To learn thermometric experiments and conductivities.

1. Determination of UCST and UCSC of phenol-water system.
2. Conductometric titration of a strong acid and a strong base.
3. Partition Co-efficient of Iodine between water and CCI4.
4. Determination of Equilibrium constant between KI and Iodine.
5. Study of Zero order kinetics by using Iodination of Acetone.

***Marks Distribution: 75 marks***

| | |
|---|---|
| *1 . Record* | *10marks* |
| *2. Procedure* | *10marks* |
| *3. Viva Voce* | *05marks* |
| *4. Experiment* | *50marks (Expt. 25 + Manipulation 25)* |

***Reference Books:***

1. Basic principles of Practical chemistry by V. Venkatesaran.
2. Basic principles of Practical chemistry by R. Veeraswamy.
3. Basic principles of Practical chemistry by A.R. kulandaivelu.

**SEMESTER VI**

**CORE PRACTICAL XVI**

**GRAVIMETRIC ESTIMATION – II**

U3CHPR61
4 HOURS/WEEK
CREDITS: 3

***Objective:***

To learn gravimetric estimation techniques.

a. *Estimation of calcium as calcium oxalate monohydrate.*
b. *Estimation of sulphate as barium sulphate.*
c. *Estimation of Nickel as Nickel dimethyl glyoxime.*
d. *Estimation of Magnesium as Magnesium oxinate.*

***Marks Distribution: 75 marks***

| | |
|---|---|
| *1 .Record* | *10marks* |
| *2. Execution of work* | *35marks* |
| *3. Accuracy/ Result* | *25marks* |
| *4. Viva Voce* | *05marks* |

***Reference Books:***

1. Text books of Practical Inorganic Chemistry by A.I. Vogel.

**SEMESTER VI**
**CORE PRACTICAL XVII**
**(ORGANIC PREPARATION & BOILING POINT DETERMINATION)**

U3CHPR62
3 HOURS/WEEK
CREDITS: 4

***Objective:***

1. *To learn the skills of preparative methods.*
2. *To learn the determination of boiling points of liquids.*

***I. Organic Preparations***

**Acylation**

a. Acetylation of salicylic acid or aniline.
b. Benzoylation of aniline or phenol.

**Nitration**

a. Preparation of m-dinitrobenzene
b. Preparation of p- nitroacetanilide

**Halogenation**

a. Preparation of p-bromoacetanilide
b. Preparation of 2,4,6-tribromophenol

**Diazotisation / coupling**

a. Preparation of methyl orange Oxidation
b. Preparation of benzoic acid from toluene

**Hydrolysis:**

a. Hydrolysis of ethyl benzoate (or) methyl salicylate

***II. Determination of boiling point of Water, Ethanol, Benzene, Acetic Acid and Toluene.***

***Marks Distribution: 75 marks***

| | |
|---|---|
| *1 . Record* | *10marks* |
| *2. Procedure* | *15marks* |
| *3. Preparation* | *25marks* |
| *4. Recrystallisation* | *05marks* |
| *5. Boiling point* | *15marks* |
| *6. Viva Voce* | *05marsk* |

***Reference Books:***

1. Vogel's text book of chemical analysis.

2. Practical chemistry - A.O. Thomas - Scientific book center, Cannanore.
3. Practical chemistry-S. Sundaram - 3 Volumes - S. Viswanthan.
4. Vogel's text book of practical organic chemistry – Longman.

## SEMESTER VI
## SKILL BASED SUBJECT IV

## INSTRUMENTAL ANALYSIS

U3CHSB61
5 HOURS/WEEK
CREDITS: 3

***Objective:***

1. *To impart knowledge about different spectroscopy techniques, Chromatography & data analysis.*
2. *To explore the students the use of online/You tube lectures.*

**UNIT-I** **15 HOURS**

1.1 **Data Analysis** - Theory of errors - idea of significant figures and its importance with examples - precision - accuracy - methods of expressing accuracy - error analysis - minimizing errors method of expressing precision - average deviation - standard deviation and confidence limit.

1.2 **Mass spectroscopy**: basic principles of mass spectrum – molecular ion peak - base peak - isotopic peak - meta stable peak - factors influencing the fragmentation - nitrogen rule - ring rule - determination of molecular formulae with examples - instrumentation

**UNIT-II** **15 HOURS**

2.1 **Infra-red spectroscopy**: molecular vibrations - Hooke's law - vibrational frequencies - factors affecting vibrational frequencies - instrumentation - block diagram - source - monochromator - cell sampling echniques - detector and recorders.

2.2 **Raman spectroscopy**: Rayleigh and Raman scattering – Stokes and Anti Stokes lines - instrumentation - block diagram - differences between IR and Raman spectroscopy - mutual exclusion principle - applications.

**UNIT – III** **15 HOURS**

3.1 **$H^1$ NMR spectroscopy** : Principle of Nuclear magnetic Resonance - basic instrumentation - shielding mechanism - chemical shift - number of signals - spin-spin coupling and coupling constants - splitting of signals.

3.2 **$H^1$NMR** spectrum of simple organic compounds such as ethyl bromide, 1,1,2-tribromoethane, ethanol, acetaldehyde.

**UNIT-IV** **15 HOURS**

4.1 **UV - Visible spectroscopy** - Absorption laws. Calculations involving Beer Lamberts Law - instrumentation photo colorimeter and spectrophotometer- block diagrams with description of components - theory - types of electronic transitions - chromophore and auxochromes - Absorption bands and intensity - factors governing absorption maximum and intensity.

4.2 **Separation techniques**: principle of adsorption and partition chromatography columm chromatography - principle - adsorbents used - preparation of column - adsorption - elution - recovery of substances - Applications

**UNIT – V** **15 HOURS**

5.1 **Thin layer chromatography** - principle - choice of adsorbent and solvent - preparation of chromatogram – $R_f$ value - applications. Paper chromatography-solvents used - principle - $R_f$ value factors influencing $R_f$ value - applications - separation of amino acid mixture - radial paper chromatography. Paper electrophoresis - principle and applications

5.2 **Ion exchange chromatography** - principle - resins - action of resins - experimental techniques - applications - separation of metal ions, separation of chloride and Bromide ions - removal of interfering radicals You tube multimedia lectures on separation techniques.

***Reference Books:***

1. Elements of analytical chemistry - R. Gopalan, P.S. Subramanian, K. Rengarajan - S. Chand and sons (1997).

2. Fundamentals of analytical chemistry - D.A. Skoog and D.M. West - Holt Reinhard and Winston Publication - IV Edition (1982).
3. Principles of instrumental methods of analysis - D.A. Skoog and Saunders - College publications - III edition (1985).
4. Analytical chemistry - S.M. Khopkar - New Age International.
5. Instrumental methods of chemical analysis - Chatwal - Anand - Himalaya Publishing house - (2000).
6. Analytical chemistry - R.Gopalan - Sultan Chand
7. Analytical Chemistry S.Usharani, Macmillan.
8. Instrumental methods of Analysis - Willard et al - c x B S.
9. Physico chemical techniques of analysis - P.B. Janarthanam - Vol- I & II - Asian Publishing.
10. Instrumental methods of Chemical analysis – B.K. Sharma - Goel publications.

# *DEPARTMENT OF BIOTECHNOLOGY*

# CORE V: INDUSTRIAL BIOTECHNOLOGY

Class: **III B.Sc Biotech** **SEM V** Hours: **6**

Subject Code: **U3BT5001** Credit: **5**

**Objective:** *To understand the process and application of Biotechnology for production of bio products of commercial importance at Industrial scale.*

**Unit I**

**Introduction to Fermentation Biotechnology**: Introduction: Objective and Scope of industrial Biotechnology, A Historical overview of Industrial Fermentation. Bioreactors in fermentation technique - Types of Bioreactor. Downstream process.

**Unit II**

**Strain Development**: Microbial culture: Microbial growth in batch and continuous culture. Isolation, Preservation and Improvement of Industrial Important microbes Media requirement for fermentation: carbon & nitrogen sources, minerals, vitamins & antibiotics. simple and complex media.

**Unit III**

**Microbial Production of Primary and secondary metabolites**: Role of microbes in production of Primary and secondary metabolites, Production of commercially important organic solvents – ethanol, acetone, vitamins A, B & B12 carotene. Organic acids: acetic acid, citric acid & lactic acid. Antibiotics: tetracycline, macrolids, erythromycin, steroids.

**Unit IV**

**Fermented foods and Agricultural products**: Production of Cheese, Yoghurt, Milk products, Natural preservatives, Bio- pesticides, Bio-fertilizers, SCP Mushroom cultivation & Cyanobacteria.

**Unit V**

**Bio remediation**: Various aerobic and anaerobic processes for waste water treatment and solid waste management. Microbes in mining, oil recovery & production of Bio Fuels.

**Reference books**:

1. Microbiology Prescott Harley fifth edition McGraw Hill Higher Education – (2002)

2. Biotechnology-A hand book of Industrial; Microbiology W Cruger and A Cruger (2004)

3. Industrial Microbiology by L.E.Casida Willey Eastern Limited 1989

4. Environmental biotechnology and Cleaner Bioprocess Edited by Eugenia Olguyine (2001)

5. Principles of Fermentation Technology Stanbury Whitaker Second edition
Aditya Books Private Limited (1995)

7. Food Microbiology A.R. Adams, M.O. Moss, University of Surrey UK (2004)

**Text Books:**

1. Biotechnology by Satyanarayana I Edition (2005)

2. Industrial Microbiology A. H. Patel II Edition (2007)

## INDUSTRIAL BIO TECHNOLOGY - PRACTICAL

CLASS: **III B.Sc BIOTECH** **SEM-V** Hours: **3**

SUB. CODE: **U3BTPR51** Credit: **2**

1. Isolation of any one industrially important enzyme and antibiotics

2. Production and estimation of biomass (SCP)-dry weight and wet weight method

3. Production of Acetic acid or Amylase or any solvent.

4. Immobilization of yeast cells

5. Immobilized yeast for alcohol production and estimation

6. Mushroom cultivation.

## CORE VI- r DNA TECHNOLOGY

CLASS**: III B.Sc Biotech** **SEM- V** Hours: **6**

SUB.CODE**: U3BT5002** Credit: **5**

**Objective:** *To understand the concept of genetic engineering and impart knowledge about its applications.*

**Unit I:** Introduction to rDNA technology - Components of r-DNA: DNA polymerase, polynucleotide kinase, alkaline phosphatases, DNA ligase, nick translation systems, deoxynecletidyltranserase, reverse transcriptase, restriction endonucleases

**Unit II:** Cloning vectors: Plasmid vectors – pBR322, PUC, Ti plasmid – Phage vectors: lambda, M13 – cosmids, phagemid: Yeast vector: expression vector, shuttle vector. Plant and animal vector – CaMV, SV40. Artificial chromosomes – BAC and YAC

**Unit III:** Gene probes: Types and methods of gene probe generation. Methods of labelling gene probes.Strategies for identifying desirable recombinant clones. Gene mapping techniques.

**Unit IV:** cDNA arrays and micro array technology. Molecular markers – RFLP, RAPD, VNTR, SSRs, AFLP, Cox gene. DNA finger printing – production of recombinant proteins – insulin and HGH.

**Unit V**: Genes for vaccines – Vaccine for hepatitis – B virus, vaccine for rabies virus; vaccine for polio virus; malaria vaccine & vaccine for Ebola virus. Genes associated with genetic diseases – phenylketonuria; urokinase, thalassaemia & hemophilia.

**Reference Books:**


1. Genes to clones – Ernst L Winnacker, Panima Publishing House, New Delhi. (2003)
2. Gene cloning – T A brown, Blackwell Science (2001).
3. Molecular Biotechnology – Bernard R Glick and Jack J Pasternak, Panima Publishing House, New Delhi (2002).


**Text Books:**


1. A text book of Biotechnology, RC Dubey, S. Chand and Company Ltd (2006).
2. Biotechnology by satyanarayana (2010)

## Core Practical

### r- DNA Technology

CLASS: **III B.Sc Biotech** **SEM- V** Hours: **3**

SUB.CODE: **U3BTPR52** Credit: **2**

1. Isolation of Plasmid Vector
2. Restriction Digestion
3. SDS PAGE
4. Agarose Gel Electrophoresis
5. Southern Blotting
6. Bacterial Transformation
7. Genetic Recombination in Bacteria
8. Isolation of Genomic DNA
9. PCR
10. Dot ELISA

### ELECTIVE I - ANIMAL BIOTECHNOLOGY

CLASS: **III B.Sc Biotech** **SEM- V** Hours: **4**

SUB.CODE: **U3BTE501** Credit: **4**

**Objective:** *To impart the knowledge about the techniques, assays and applications of the animal cell culture technique.*

**Unit I**

**Introduction to animal cell cultures**- Infrastructure and equipments- Sterile area, Laminar flow hood, Carbon di oxide incubator, Cryostorage (Liquid Nitrogen Flask) refrigerated centrifuges, Freezer (-80 C), Inverted microscope, Magnetic stirrer

**Unit II**

**Media preparation and sterilization**- Sterilization of glass wares & reagents- Primary culture- Mouse embryo cell culture, Protocol for isolating mouse embryo, Primary cell

lines, Enzymatic disintegration, warm and cool trypsin treatment, collogenic treatment, sieving separation of viable and non –viable cells, MTT assay.

**UNIT III**

**Cell lines and Cryo preservation** –Immortalization of cell lines with viral genes- SV40, Papilloma virus, Barr virus, Maintenance of cell line, Criteria for subculture, States of cryopreservation, Freezing cells, Thawing of frozen cells.

**UNIT IV**

**Gene transfer methods-** Microinjection, Embryonic stem cell gene transfer, Retro virus and gene transfer – Transgenic animals- Mice, Cow- Animal propagation- Artificial insemination, Animal clones.

**UNIT V**

**Gene Modification in Medicine** -Gene therapy, Types of gene therapy, Vectors in gene therapy, Molecular engineering, Human genetic engineering problems and ethics.

**Reference Books:**


1. Gene cloning (5th Edition), T.H. Brown, Blackwell publishing – (2010)
2. Principles of Gene manipulation, S.B. Primrose, Richand. M. Twyman R.W. Old, Blackwell science (2001)


**Text Books:**


1. Biotechnology By Satyanarayana – (2010)


## ELECTIVE I – ENDOCRINE BIOTECHNOLOGY

CLASS: **III B.Sc Biotech** **SEM- V** Hours: **4**

SUB.CODE: **U3BTE502** Credit: **3**

**Objective:** *To understand about the role of hormones in functioning of human body and biochemical impact.*

**UNIT – I**

Endocrinology- introduction – definition scope, importance hormone – peptide and steroid Hormone, Mechanisms of their action,

**UNIT - II**

Pituitary gland- Anterior and Posterior, Hormones: ACTH Growth Hormone prolactin, TSH, LH, FSH, hypopituitarism, gigantism acromegaly Dwarfism. Thyroid

Gland Hormone: Synthesis, Secretion, Functions. Hypothyroidism and hyperthyroidism. Thyroid nodules and thyroid cancer.

**UNIT – III**

Para thyroid hormone (PTH) Calcitonin their role in bone metabolism osteoporosis .adrenal gland hormones: Glucocorticods and biological effects, Addison's, disesse, Cushing's syndrome Hirsuitism Adrenal Medullary Hormone – Hypo and Hyper function of adrenal Medulla,

**UNIT – IV**

Endocrine hormones: -pancreas, insulin & glucagon, diabetes mellitus type I – II, treatment of diabetes. Reproductive Glands : testis – spermatogenesis and steroidogenesis male gonad disorders, male infertility gynecomastia. Ovary: - the ovarian cycle, disorders of ovarian dysfunction – Amenorrhea – Hormonal Contraception – Infertility – IVF , the endocrinology of pregnancy.

**UNIT – V**

Hormones and cancer steroid dependent tumour, tumour affecting endocrine function, endocrine therapy for cancer, breast cancer in woman endometrial cancer, prostatic cancer. Endocrine auto immune diseases.

**Reference Books:**


1. Basic & Clinical endocrinology – F.S. Greenspan & D.G.Gardner-(2007)
2. Harper's Biochemistry – Murray , Granner, Mayes,Rodwell-(2001)
3. Evidence Based endocrinology – P.M. Camacho,Hossein Gharip,G.W.Sizemore(2007)
4. Endocrinology: Hormones and Human Health – Prakash Loher-(2014)


**Textbooks:**


1. Text Book of Medical Physiology –Guyton-(1996)
2. Text Book of Endocrinology – R.H.Williams –(2009)

## SKILL BASED III - HERBAL TECHNOLOGY

CLASS: **III B.Sc Biotech** **SEM- V** Hours: **4**

SUB.CODE: **U3BTSB51** Credit: **3**

**Objectives:** *Elementary treatment of various parameters used in the identification and utilization of medicinal plants in general. The course provides the students with an opportunity to explore and exploit the medicinal values of Herbal plants.*

**Unit – I:** History of Herbal plants (Ayurveda, Siddha, Unani)– History of Medicine in the Islamic Civilization. Basic concepts of Cultivation and Collection of Plant Materials preparation of drugs for commercial market – Packaging and storage.

**Unit – II:** Basics knowledge of herbal plants: Local Name, Scientific (Botanical) Name, Chemical constituents and Uses: Adhatoda vasica, Aloe vera, Azadirachta indica, Coriandum sativum, Catharanthus roseus, Datura metal, Eclipta alba, Emblica officinalis, Ficus recemosa, Myristica fragrans, Ocimum sanctum, Phyllanthus amarus and Zingiber officinale.

**Unit – III:** Scope of Pharmacognosy, Standardization of herbal medicine - How to Preserve Herbs - Protocols for standardization of herbal drugs - Extraction methods. Single herbal formula and Poly herbal formula. Extraction of phytopharmaceuticals : Alkaloids, Volatile oils, Resins and Tannins.

**Unit – IV** : Basic Plant tissue culture techniques : Media preparation, Sterilization, Single cell culture, Suspension culture, Organ culture and embryo rescue. Somatic embryogenesis and Synthetic seeds. Gene bank – Germplasm and Cryopreservation.

**Unit – V:**. Micro propagation, Somaclonal variation, Haploid production, Somatic hybridization, Protoplast isolation, culture, fusion, regeneration. Plant transformation technique –Plasmid DNA, Ti plasmid, Ri plasmid, Agrobacterium tumefaciens (DMGT, PEG, Microinjection, Gene machine)

**Reference Books:**


1. Hand Book of Ayurvedic & Herbal Medicines with Formulations, Arora bandi bai sri UP press. (1991).
2. The Natural History of Medicinal Plants, Sumner, Judith. Timber Press. (2000)

3. Text book of Natural Medicine, Joseph E. Pizzorno, Michael T. Murray. Publisher: Churchill Livingstone. (2012).

***Text Books:***

1. The Complete Book Of Ayurvedic Home Remedies, Vasant Lad, Little, Brown Book Group. (2006).
2. Mooligai maruthuvam (Herbal Medicine), Thirugyanam.S. Selvi pub. Press. (2014).
3. Biotechnology, Sathyanarayana U. Books and Allied (P). Ltd, Kolkata. (2005).

## CORE VII - ENVIORNMENTAL BIO TECHNOLOGY

CLASS: **III B.Sc Biotech** **SEM VI** Hours: **6**

SUB. CODE: **U3BT6001** Credit:**5**

**Objective:** *To understand the importance and application of Biotechnology in preserving Ecosystem and Environment.*

**Unit I**

Introduction to Environmental issues and Management: Scope and awareness of global environmental problems- Global warming: causes of global warming, green house effects - accumulation of toxic gasses in environment. Effects of global warming - ozone depletion. Environmental policy and Environmental impact assessment.

**Unit II**

An overview of atmosphere – Hydrosphere, Lithosphere and Anthrosphere. Environmental problem. Environmental pollution -Air, Water, noise pollution – causes, effects and preventive measures. Environmental Impact assessment.

**Unit III**

Waste Water treatments: Aerobic process, Activated sludge oxidation ponds, trickling filters rotating discs, oxidation ditch. Anaerobic process: Anaerobic digestion, anaerobic filters, sludge blanket reactors. Treatment of Industrial Waste of dairy, distillery, tannery and Sugar.

**Unit IV**

Xenobiotic compounds -Organic (Chlorinated hydrocarbons substituted simple aromatic compounds, poly aromatic hydrocarbons, pesticides surfactants, and Inorganic

(Metals, radio nuclides, phosphates, nitrates) Bioremediation of Xenobiotic in environment - Ecological consideration, Decay behavior and degradative plasmids, molecular techniques in bioremediation.

**Unit V**

Renewable and Non Renewable resources. Role of immobilized cells / enzymes in treatment of toxic compounds. Bioleaching, Biomining, Biotechniques for air pollution abatement and odour control.

**Reference books:**

1. Chemistry and the Environment, johnson D.O.Netterville J.T.Wood J.C.and James M.W.B Saundars company Philadelphia, (1973).

2. Waste Water Engineering -treatment ,disposal and reuse Metcalf and Eddy Inc Tata McGraw Hill New Delhi. (1979).

3. Environmental chemistry, AK De, Wiley Eastern Ltd New Delhi. (2010)

4. Introduction to Biodeterioration, D. Allospp and K.J .Seal, ELBS, /Edward Arnold. (2004)

5. Bio remediation, Baakedr, K H and Herson D S, McGraw hill Inc New York. (1994)

6. Environmental Molecular Biology Paul A. Rochelle, Horizon Press, (2001).

**Text Books:**

1. Biotechnology by Satyanarayana (2010)

2. Industrial and Environmental bio technology -Nuzhat Ahmed, Fouad M Qureshi and Obaid Y. Khan, Horizon press. (2006)

## Core Practical: IV

## ENVIORMENTAL BIOTECHNOLOGY PRACTICAL

CLASS: **III B.Sc Biotech** **SEM –VI** Hours: **3**

SUB. CODE: **U3BTPR61** Credit: **2**

1. WATER ANALYSIS

(i) Estimation of Dissolved oxygen
(ii) Estimation of Salinity
(iii) Estimation of pH

(iv) Estimation of Carbon dioxide
(v) Estimation of Chloride
(vi) Estimation of Alkalinity
(vii) Estimation of Calcium
(viii) Estimation of Carbonate & Bicarbonate

2. Microbial assessment of Air, Water & Soil.

## CORE VIII - BIOINFORMATICS

CLASS: **III B.Sc Biotech** **SEM- VI** Hours: **6**
SUB.CODE: **U3BT6002** Credit: **5**

**Objectives:** *To make learner to understand the basics of computer and Bioinformatics.*

**Unit I:** History of computer - Types of computers: Mainframe, Supercomputer, Desktop computer, Notebook computer, Binary numbers (Bits and Bytes) – CPU (types of processors). Input and Output devices. Memory: RAM and ROM – Secondary storage devices – floppy, hard disc, optical disk.

**Unit – II** Operating system – MS DOS, Windows and UNIX. Office automation tools – MS word, Excel and PowerPoint. Computer Network – LAN and WAN. Application of biological science.

**Unit –III** Internet and its applications – www, URL, HTML, FTP. Intranet, Email, teleconferencing. File Transformation – Download and upload. Scope and Application of computers in Bioinformatics.

**Unit-IV** Biological sequences and Databases (Nucleic acid, proteins – primary, secondary, tertiary databases). Sequences analysis and database searching (Sequence alignment techniques-Pairwise-local, global Dotplot) – Database search tools (BLAST, FASTA). Protein sequence based analysis and predictions (Identification of Motifs, Visualization and 3D structure using tools).

**Unit – V** Online Journal databases : Pubmed, Medline, Molecular modeling – homology modeling – swiss model. Phylogenic Tree structure, Drug discovery – procedures and applications.

**Reference books:**


1. Introduction to bioinformatics, Attwood T.K. and Pary Smith D.J. Pearson Education Asia. (2002).
2. Bioinformatics for Beginners: Genes, Genomes, Molecular Evolution, Databases and Analytical Tools, Supratim Choudhuri, Academic Press Inc; 1 edition. (2014).
3. Practical Computing for Biologists, Steven Haddock and Casey Dunn, Publisher: Sinauer Associates, Inc. (2010).


***Text Books:***


1. *Biostatistics, Computer Application, Bioinformatics & Instrumentation, Arumugam. M. A. Gopi. Saras Publication. (2010).*
2. Fundamentals of Bioinformatics, Mani. K., Kovai. (2000).


## CORE VIII - PRACTICAL - BIOINFORMATICS

CLASS: **III B.Sc Biotech** **SEM- VI** Hours: **3**

SUB.CODE: **U3BTPR62** Credit: **2**

1. Input Devices
2. Output Devices
3. MS Office - word for Bio data preparation and News paper format
4. Excel for Mark sheet preparation
5. File Transformation – Email and upload / Download methods of file compression.
6. BLAST, RASMOL, FASTA, SwissProt.
7. Phylogenic Tree structure.

**Spotters**

- Keyboard, Mouse, Monitor, Printer, etc.
- Memory device (CD, Hard disk, Pendrive, Floppy, etc)
- Bioinformatics s/w tools

## ELECTIVE III - MEDICAL BIOTECHNOLOGY

CLASS: **III B.Sc Biotech** **SEM- VI** Hours:**4**

SUB.CODE: **U3BTE601** Credit:**4**

**Objective:** *To impart the knowledge of biotechnological advancement in treating infectious and genetic diseases and to impart the principles involved in preparation of antibodies and vaccines.*

**UNIT- I**

Human physiology: Introduction to Human physiology, Organ structure and Function as involved in Respiratory, Circulatory- Digestive –Excretory-Nervous and Reproductive Systems.

**UNIT – II**

Disease and Diagnostics: Infectious diseases caused by bacteria, fungi and virus. Genetic diseases – Cystic fibrosis, Alzheimer's diseases, Dunchenne muscular dystrophy (DMD), Use of nucleic acid probe, antibodies in clinical diagnostics.

**UNIT – III**

Blood and Composition, Anaemia, leukaemia Necrosis and Apoptosis, stem cell and Bone marrow transplant, Therapeutic application of antibodies.

**UNIT – IV**

Hybridoma technology: -Producing monoclonal antibodies, Human gene therapy and its ethics. Pharmacology Drug action, drug discovery and drug delivery, Prodrug, Source of drug information, drug design.

**UNIT – V**

Medical Engineering – Antibody engineering cell adhesion based therapy, tissues engineering artificial blood, blood component based therapy. Application of PCR in

medical diagnosis and finger printing, stem cell culture and bone marrow transplantation – its Application.

**Reference Books:**


1. Immunology by Roitt- (2006)
2. Immunology by Kuby-(2003)
3. Medical Physiology Guyton and Hall-(1996)
4. Medical microbiology Mims Play fair Roitt, wekelin Williams.-(2009)
5. Biopharmaceuticals: Biochemistry and biotechnology, Harvard Academic publishers-(1998)
6. Human Genetics- Gangane –(2000)


**Text Books:**


1. Medical Microbiology by Green
2. Fundamentals of Biochemistry- J. L. Jain-(2006)
3. Text book of Biotechnology by R. C. Dubey-(2008)
4. Biotechnology by Satyanarayana-(2010)


## ELECTIVE II- NANO BIOTECHNOLOGY

CLASS: **III B.Sc Biotech** **SEM- VI** Hours: **4**

SUB.CODE: **U3BTE602** Credit: **4**

**Objectives:** *To impart the scientific knowledge of techniques and applications of Nanobiotechnology in the field of medicine and Environment.*

**Unit I** : **Nanomaterials –Definition and methods of preparation** – Physical approaches- Arc discharge Method, Laser ablation, Aerosol synthesis, chemical approaches – Solvothermal synthesis, hydrothermal synthesis, Micro wave method, Biological synthesis of nano particles.

**Unit II: Properties of Nanomaterials** - Physicochemical properties, optical properties- Semiconducter nanoparticles, Metal nano particles, Electrical and Electronic properties, Redox properties, Mechanical properties and Magnetic properties, Catalytic activity

**Unit III: Characterization of Nanoparticles**- X-ray diffraction (XRD), UV-Visible Spectroscopy, Scanning Electron Microscopy (SEM), Transmission Electron Microscopy(TEM), Scanning Tunneling Microscope (STM), Atomic Force Microscope (AFM).

**Unit IV: Methods of sample preparation**- Chemical fixation technique, Cryofixation technique, Dehydration, Embedding biological samples section, Sectioning, Staining, Mechanical milling, Chemical etching, Ion etching, Conductive coating.

**Unit V: Applications of Nanomaterials** - Medicine - Diagnosis, Therapeutic agents, gene therapy, Antimicrobial activity and wound healing, Tissue engineering, cosmetics. Communication in Bacteria, Satellite Communication. Environment- Nano materials for Pollution abatement- Environmental sensors.

**Reference Books:**


1. Nanotechnology- Principles and Practical, Sulbha Ko Kulkarni, Capital publishers Co. (2011)
2. Nano materials – B. Viswanathan Narosa Publishing House, NewDelhi. (2011)
3. Principles of Nanoscience and Nanotechnology – M.A. Shah, Tokeer Ahmed, Narosa Publishing House, NewDelhi. (2010)
4. Graphene the Wonder Material - Dr. S. Ramaprabhu, Dr. Rupali Nagar, Sams publisher, Chennai.


## SKILL BASED IV- MARINE BIOTECHNOLOGY

CLASS: **III B.Sc Biotech** **SEM- VI** Hours: **4**

SUB.CODE: **U3BTSB61** Credit: **3**

**Objectives:** *To understand the importance of Diverse life forms in Seas & Oceans and use of biotechnological techniques to explore its beneficial and medicinal impacts.*

**Unit I: General account on Oceanography**

**Physical Oceanography** - Light, temperature, density and pressure - Thermal and optical properties of seawater - Tides and waves.

**Chemical Oceanography**- Salinity, chlorinity, pH, gases, Dissolved and particulate organic matters and nutrients

**Biological Oceanography** - plankton, nekton and benthos- Plankton in relation to fisheries.

**Unit II: Marine biodiversity**

Marine Biodiversity: Global, National and Local scenario. Distribution of life on marine habitats (Iintertidalzone, rocky shore, muddy shore, sandy shore, mangrove ecosystem, reefs, shallow water, deep sea).Conservation strategies - Molecular approach to conservation of marine biodiversity.

**Unit III: Marine bioprospecting**

Marine Natural Products – antimicrobial, antiviral, anticancer drugs and marine toxins - bioadhesives– Marine microbes of Biotechnological importance.

**Unit IV: Marine Pollution**

Marine pollution-major pollutants (heavy metal, pesticide, oil, thermal and radioactive, - Biological indicators (Marine microbes, algae and crustaceans) andaccumulators -Role of biotechnology in environmental pollution control - Indicator organisms - Testorganisms - Monitoring organisms-.

**Unit V: Fouling and corrosion**

Biofouling - Biofilm formation - Marine fouling and boring organisms - Antifouling and Anti boring treatments - Application of biotechnology in controlling the bio deterioration of wood. –Bio invasion and ballast water.

**Reference Books:**


1. An Introduction to Marine Environment, Weyl, R R, Oceanography, John Wiley,(1974).
2. Introduction to physical Oceanography, Thurman, HV, Merril Publ. Co. (1988)
3. Biological Oceanography, Angel, MV, Methuen, (1975).
4. Introduction to Marine Plankton, Mitra , A. Ed Daya Publication, New Delhi (2001)


**Text Books:**


1. A Text Book of Marine Biology, Nair, MB, & Thamphy, DM, Mac Millan, (1980)
2. Environmental Biotechnology, Principles and applications by Bruce E.Rittmann and Perry L. McCarthy., McGraw Hill.

# *DEPARTMENT OF BIOCHEMISTRY*

**SEMESTER V** **PAPER V**

## ENZYMOLOGY

**Hours per week: 5** **Paper Code: U3BI5001**

**Total Hours: 75** **Credits: 4**

**OBJECTIVE:** To understand the various classes of enzymes, enzyme kinetics and uses of some enzymes in industries.

**UNIT- I INTRODUCTION & CLASSIFICATIO 20 Hrs**

Discovery, nomenclature and classification of enzymes. Active site, induced fit theory, lock and key mechanism, enzyme specificity (stereo-, reaction and substrate specificity). A brief account of non-protein enzymes- ribozymes and DNA enzymes.

**UNIT-II ENZYME KINETICS 15 Hrs**

Enzyme activity, specific activity, activation energy.Factors affecting enzyme activity - substrate concentration, temperature, pH and activators.Michaelis-Menten equation, Km, Vmax and Lineweaver Burk plot.Enzyme units-katal, IU and turnover number. Ping-pong, bi-bi mechanism.

**UNIT- III ENZYME CATALYSIS AND INHIBITION 15 Hrs**

Mechanism of enzyme action- general acid-base catalysis, electrostatic catalysis, covalent catalysis, Enzyme inhibition- reversible inhibition, competitive, uncompetitive, noncompetitive, and allosteric inhibition (only concepts).

**UNIT- IV COENZYMES & ISOENZYMES 15Hrs**

Coenzymes- prosthetic group, classification- vitamin and non-vitamin coenzymes. Structures and functions of $NAD^+$, $NADP^+$, FMN, FAD and coenzyme Q. Isoenzymes- isozymes of LDH, diagnostic importance of LDH.

**UNIT- V ENZYMES IN INDUSTRIES 10Hrs**

Industrial uses of amylase, protease, glucose isomerase, cellulase, pectinase, catalase.Immobilization of enzymes- methods, advantages and applications.

**TEXT BOOK:**

1. Enzymes – Trevor Palmer, Affiliated East-West Press Pvt. Ltd.

**REFERENCES:**

1. Biochemistry – U. Satyanarayana, Books and Allied (P) Ltd.

2. Lehninger Principles of Biochemistry – Nelson and Cox, Macmillan Worth Publishers.

3. Fundamentals of Biotechnology- V. Kumaresan, Saras Publications.

**SEMESTERV** **PAPER VI**

## GENETICS AND MOLECULAR BIOLOGY

**Hours per week: 4** **Paper Code: U3BI5002**

**Total Hours: 60** **Credits: 4**

**OBJECTIVES:**To understand genetic inheritance, gene expression, repair and mutation.

### UNIT-I- GENETICS

Mendelian genetics: Mendel's laws of inheritance – mono hybrid experiments, law of dominance, law of segregation, phenotype, genotype, alleles, homozygous, heterozygous, test cross, back cross, di hybrid experiments - law of independent assortment and law of incomplete dominance.

### UNIT-II- REPLICATION

DNA as genetic material, Types of replication, evidence for semi conservative replication. Replication in prokaryotes, DNA polymerases I, II, III, topoisomerases, Okazaki fragments, DNA ligases and inhibitors of replication.Reverse transcriptase, retroviruses. Highly repetitive, moderately repetitive and unique DNA sequences. satellite DNA.

### UNIT-III- TRANSCRIPTION

Prokaryotic transcription, RNA polymerases, role of sigma factor, initiation, elongation and termination.(Rho - dependent and independent).Inhibitors of transcription, rRNA and tRNA modification.

### UNIT-IV- TRANSLATION

Genetic code - definition, deciphering and salient features of genetic code, composition of ribosomes, structure of t-RNA, coding and non-coding strands of DNA Translational activation of amino acids, initiation, elongation and termination of protein synthesis in prokaryotes. Inhibitors of protein synthesis.Brief account of post translational modification of proteins.

### UNIT – V- GENE- MUTATION, REPAIR AND REGULATION

Gene mutation types - point mutation, transition mutation, transversion mutation, frame shift mutation, insertion and deletion mutation.

DNA repair mechanism - excision repair, SOS and UV repair. Prokaryotic gene regulation - Operon, Lac operon, positive and negative control.

### TEXTBOOK:

1. Lehinger's principle of Biochemistry (2000), Nelson and Cox.

**REFERENCES:**

1. Genes VIII 2004. Benjamin Lewin, Oxford Univ press.
2. Cell and Molecular Biology - 3rd Editioin (2002).G Karp. John Wiley and Sons N.Y
3. Molecular cell biology - David Freifielder 2nd Edition, Narosa publishing House.
4. Biochemistry of Nucleic acids - Adam et al
5. Molecular biology - SC Rastogi CBS publishing 2nd Edition
6. Cell biology and Genetics - P.S. Verma and V.K.Agarwal, S. Chand publication
7. Advance molecular cell biology - R.M.Twyman.W.wisden
8. Genetics - ManjuyadavIst Edition 2003, Discovery publishing House.
9. Harper's Biochemistry - Rober K. Murray, Daryl K.Grammer, McGrawHill, Lange Medical Books

**SEMESTER V** **PAPER VII**

## HUMAN ANATOMY AND PHYSIOLOGY

**Hours per week: 4** **Paper Code: U3BI5003**

**Total Hours: 60** **Credits: 4**

**OBJECTIVE:**To understand the anatomy and physiology of vital human organs.

### UNIT – I SKELETAL & MUSCULAR SYSTEM 10 Hours

Human tissues- types, homeostasis. Introduction to systems - skin and soft tissue, skeletal system. Muscles: Types, functions and physiology of muscle contraction, types of muscle contraction- Neuromuscular junction.

### UNIT – II DIGESTIVE & RESPIRATORY SYSTEM 10 Hours

Secretions of digestive tract, digestion, absorption, assimilation of carbohydrates, proteins, fats.Structure of lungs.Mechanism of respiration. Transport and exchange of gases between lungs and tissues,

### UNIT – III CARDIOVASCULAR SYSTEM 10 Hours

Blood composition, function, mechanism of blood coagulation.Structure and function of heart, cardiac cycle, types of blood circulation.Structure and function of arteries, veins and capillaries.

**UNIT – IV EXCRETORY & REPRODUCTIVE SYSTEM 15 Hours**

Structure and function of kidney.Mechanism of urine formation.Structure and function of the male and female reproductive organs, menstrual cycle.Physiology of pregnancy and lactation.

**UNIT – V ENDOCRINE & NERVOUS SYSTEM 15 Hours**

Brief outline of various endocrine glands and their secretion, physiological role of hormones.Classification of nervous system, characteristics of sympathetic and parasympathetic function.

Structure and function of neuron, brain and spinal cord.

**TEXTBOOK:**

1. Animal physiology and Biochemistry- RA Agarwal, Anil. K, Srivastava, Kausshal Kumar, S. Chand & Co.

**REFERENCES:**


1. Human Physiology – Chatterjee, C.C, Volume I & II, 11th edition, 1992 Medical agency allied, Calcutta.
2. Text book of medical physiology, A.C. Guyton 10th edition.
3. Human body, Atlas, Publication Garden cheers.
4. Mammalian Biochemistry, White Handler smith.
5. Review of medical physiology, William. F. Ganong, 14th edition, A Lange Medical book.


**SEMESTER V ELECTIVE - I**

## MEDICAL LABORATORY TECHNOLOGY

**Hours per week: 5** **Paper Code: U3BIE501**

**Total Hours: 75** **Credits: 4**

**OBJECTIVE:**To understand the basic concepts of setting up and running of a medical laboratory, analysis of urine, stool, blood, CSF, sputum, amniotic fluid, culturing and testing of microbes.

**UNIT-I: LABORATORY CARE AND INSTRUMENTATION 15 HOURS**

Environmental Health and Safety, Good laboratory practices, Code of conduct for laboratory personnel - safety measures in the laboratory-chemical and reagents, labeling, storage and usage. First aid in laboratory accidents - precautions and first aid equipment.

Reporting laboratory tests and keeping records- documentation. General approach to quality control, quality control of quantitative data.

**UNIT-II: URINE ANALYSIS AND STOOL EXAMINATION 15 HOURS**

Composition, collection, preservation, gross examination, interfering factors, chemical examination. Significance of sugar, protein, ketone bodies, bile pigments, blood, uric acid in urine. Creatinine/protein ratio, 24 hour urine.Pregnancy test & interpretation.

Specimen collection- inspection of faeces- odour, pH, Interfering substance. Test for occult blood, faecal fat.

**UNIT-III: CLINICAL HEMATOLOGY 15 HOURS**

**Plebotomy**- Anticoagulant, preservation, Estimation of Hb, PCV,WBC, RBC, Platelets, ESR. Clotting time, bleeding time - normal value, clinical interpretation. Anemia, types of anemia.

**UNIT-IV: BODY FLUIDS AND BLOOD BANKING 15 HOURS**

Cerebrospinal fluid and amniotic fluid, semen analysis, sputum examination - Interpretation.Blood grouping- ABO system, Rh typing, Blood transfusion, cross matching, blood transfusion and its complications.

**UNIT-V:MEDICAL MICROBIOLOGY 15 HOURS**

Culturing of organisms from various specimens.Culture media and antibiotic sensitivity test (pus, urine, Stool, sputum, throat swab, gram staining, Zielh –Neilson staining (TB, Lapra bacilli).Safety procedure in microbiological techniques.

**TEXTBOOK:**

Medical Laboratory Technology - L. Mukherjee.Vol.I, II, III. Tata Mcgraw - Hill Publishing Company Limited, New Delhi.

**REFERENCES:**

1. Medical Laboratory Technology – V.H. Talib
2. Clinical Laboratory practices in CMC procedure, CMC, Vellore.
3. Medical lab technology - RamnikSood, Jaypee Brothers, Medical Publishers (P) Ltd, New Delhi.
4. Medical Laboratory Science- J. Ochie and A. Kolhatkar, Tata Mcgraw - Hill Publishing Company Limited, New Delhi.

**SEMESTER V** **SKILL BASED SUBJECT - II**

**MICROBIOLOGY AND ENVIRONMENTAL TOXICOLOGY**

**Hours per week: 4** **Paper Code: U3BISB51**

**Total Hours: 60** **Credits: 2**

**OBJECTIVES:**

1. To understand the morphology, classification and culture of microorganisms
2. To deepen the understanding of environmental toxins and their toxicological effects.

**UNIT- I:INTRODUCTION TO MICROBIOLOGY 10 HOURS**

Definition and scope of microbiology- history and recent developments- spontaneous generation-biogenesis contributions of Leeuwenhoek, Louis Pasteur, Robert Koch, Elie Metchnikoff and Fleming.

**UNIT- II: MICROSCOPY & STAINING TECHNIQUES**

**10 HOURS**

Microscopy- simple and compound microscopy- dark field-phase contrast- fluorescence and electron microscopy.Stain and staining techniques-simple, differential and special staining (endospore, capsular and granular).

**UNIT- III: MICROBIAL CULTURE & STERILIZATION 15 HOURS**

Composition of culture media, types of media. Bacterial Growth – Lag Phase, Exponential Phase, Linear Phase, Continuous growth. Sterilization techniques - principles - dry heat - moist heat – radiation - filtration. Disinfection and disinfective agents - sterility control for dry heat, moist heat and radiation.

**UNIT- IV:BACTERIOLOGY & VIROLOGY 15 HOURS**

Structure, morphology bacteria -cell wall composition of Gram positive and Gram negativebacteria.Bacterial diseases – Tuberculosis.Structure, morphology of viruses, life cycle of bacteriophage- Lysogeny and Lytic cycle.Viral diseases – HIV.

**UNIT- V:ENVIRONMENTAL TOXICOLOGY 10 HOURS**

Introduction, scope, principles of toxicology, Types of toxic substances - degradable and non-degradable, their sources and entry roots, factors influencing toxicity, drug toxicity, acute and chronic toxicity. Analysis of LD 50, LC 50.Detoxification- detoxification and antioxidant mechanisms in human body.

**TEXTBOOK:**

1. Dubey RC and Maheswari DK (2012). A text of Microbiology (Revised edition).S.Chand and Company Ltd., New Delhi.

**REFERENCES:**

1. GeetaSumbali and Mehrotra RS (2009).Principles of Microbiology.First edition, Tata McGraw Hill P.Ltd., New Delhi.

2. Powar CB and Daginawala H F (2005). General Microbiology volume 1 and 2. Eighth edition, Himalaya publishing house, Mumbai .

3. Pelczar TR M J Chan ECS and Kreig N R (2006). Microbiology.Fifth edition, Tata McGraw-Hill INC. New York.

4. Robert F Boyd (1984). General microbiology.Times mirror/Mosby college publishers.

5. Prescott L M, J P Harley and D A Klein (2005). Microbiology.Sixth edition, International edition, McGraw Hill.

**SEMESTER – V** **CORE PRACTICAL V**

**COLORIMETRIC ANALYSIS AND ELECTROPHORESIS**

**Hours per week: 4** **Paper Code: U3BIPR51**

**Total Practical: 15** **Credits: 4**

**OBJECTIVES:**

1. To understand the principles, protocol and calculation of each experiment.
2. They should know the preparations of all the reagent. Estimations should be done individually.

## I. COLORIMETRIC ESTIMATION

1. Estimation of Creatinine by Jaffe's method.
2. Estimation of Urea by Diacetylmonoxime method.
3. Estimation of Protein by Lowry's method.
4. Estimation of Glucose by O- Toluidine method.
5. Estimation of Glucose by Folin-Wu Method.
6. Estimation of Cholesterol by Zak's method.
7. Estimation of Bilirubin by Somoguii method.

## II. AUTO-ANALYSER

1. Estimation of the above parameters by auto-analyser- demonstration.

## III. ELECTROPHORETIC TECHNIQUES

1. Separation of proteins by SDS – PAGE.

2. Separation of nucleic acid by Agarose Gel Electrophoresis.

**TEXTBOOK:**

Medical Laboratory Technology – Kanai L. Mukherjee, Tata McGraw Hill Publication and co. ltd., Vol, I, II, III

**REFERENCES:**


1. Practical Clinical Biochemistry - Harold Varley, CBS, New delhi
2. Clinical chemistry – Ranjana Chawla
3. Laboratory Manual in Biochemistry – Jayaraman
4. Biochemical methods – S.Sadasivan And manickam
5. Introduction to practical biochemistry – David T. Plummer


**SEMESTER – V** **ELECTIVE PRACTICAL- I**

## MEDICAL LABORATORY TECHNOLOGY PRACTICAL- I

**Hours per week: 4** **Paper Code: U3BIEP51**

**Total Practical: 15** **Credits: 4**

**OBJECTIVES:**

1. Student should be trainedin principles, protocol and calculation of each experiment.
2. Student should be trained in the collection of blood and preparation of blood films.
3. They should know the preparations ofall thereagent. Estimations should be done individually.

### I. HAEMATOLOGY

1. Estimation of Hemoglobin by Shali's method.
2. Total RBC count.
3. Total WBC count.
4. Differential WBC count.
5. Determination of PCV.
6. Determination of ESR.
7. Blood grouping.
8. Determination of clotting time.
9. Determination of bleeding time.

**II. CELL COUNTER**

Determination of some haematological parameters using cell counter-demonstration.

**TEXTBOOK:**

Medical Laboratory Technology – Kanai L. Mukherjee, Tata McGraw Hill Publication and co. ltd., Vol.I, II, III

**REFERENCES:**


1. Practical Clinical Biochemistry - Harold Varley, CBS, New delhi
2. Clinical chemistry – Ranjana Chawla
3. Laboratory Manual in Biochemistry – Jayaraman
4. Biochemical methods – S.Sadasivan And manickam
5. Introduction to practical biochemistry – David T. Plummer


**SEMESTER VI** **PAPER VIII**

**INTERMEDIARY METABOLISM**

**Hours per week: 4** **Paper Code: U3BI6001**

**Total Hours: 60** **Credits: 4**

**Objectives:** To understand various metabolic pathways along with the structures and enzymes involved.

**UNIT - I METABOLISM & RESPIRATORY CHAIN 10 HOURS**

Metabolic pathways, anabolism, catabolism, amphibolism.High energy compounds, structure and role of ATP, GTP.Respiratory chain and oxidative phosphorylation.

**UNIT -II METABOLISM OF CARBOHYDRATES 15 HOURS**

Glycolysis, oxidation of pyruvate, TCA cycle, Gluconeogenesis, HMP shunt, Glycogenesis, Glycogenolysis (key enzymes and regulation).

**UNIT -III METABOLISM OF LIPIDS 15 HOURS**

Biosynthesis of fatty acids, cholesterol & their regulation.Degradation of fatty acids by β-oxidation and formation of ketone bodies.

**UNIT -IV METABOLISM OF AMINO ACIDS 10 HOURS**

Oxidative & non-oxidative deamination, decarboxylations and transamination of amino acids.Urea cycle, biosynthesis of creatine& creatinine.

**UNIT -V METABOLISM OF NUCLEOTIDES 10 HOURS**

Biosynthesis of purine and pyrimidine nucleotides (both *de novo* and salvage pathways).Degradation of purine and pyrimidine nucleotides.Ureotelic and uricotelic systems.

**TEXTBOOK:**

Harper's Biochemistry, R.K. Murray, D.K. Granner, P.A. Mayes, V.W. Rodwell, 25th edition, McGraw Hill Publication.

**REFERENCES:**


1. Principles of Biochemistry, D.J. Voet, J.G. Voet, C.W. Pratt, 3rd edition, John Wiley & Sons.
2. Fundamentals of Biochemistry, D.J. Voet, J.G. Voet, C.W. Pratt, Upgrade edition, John Wiley & Sons.
3. Lehninger Principles of Biochemistry, D.L. Nelson and M.M. Cox, Macmillan Worth Publishers.
4. Textbook of Biochemistry- 2nd edition, D.M. Vasudevan, JayPee Publishers.
5. Biochemistry- U.Sathyanarayan, 3rd edition, Books and Allied (P) Ltd.


**SEMESTER – VI PAPER IX**

## CLINICAL BIOCHEMISTRY

**Hours per week: 6** **Paper Code: U3BI6002**

**Total Hours: 90** **Credits: 4**

**OBJECTIVE:**To understand the basic concepts of clinical biochemistry, diseases related to metabolism, organ function test and importance of enzymes in diagnosis.

**UNIT-I: BASIC CONCEPTS OF CLINICAL BIOCHEMISTRY 15 HOURS**

A brief review of units and abbreviations used in expressing concentrations and standard solutions.Biochemical analytes and their normal ranges.Specimen collection and processing (Blood, urine, faeces).Anti-coagulant preservatives for blood and urine.Transport of specimens.

**UNIT-II: DISEASES RELATED TO CARBOHYDRATE AND LIPID METABOLISM 20 HOURS**

Regulation of blood sugar, Glycosuria - types of glycosuria. Oral glucose tolerance test in normal and diabetic condition.Hb A1C, Diabetes mellitus and Diabetic insipidus – hypoglycemia hyperglycemia and its treatment. Ketonemia, Ketonuria, diabetic ketosis.Complications, treatment and management of Diabetes mellitus.

Lipid and lipoproteins: Classifications, composition, mode of action - Cholesterol. Factors affecting blood cholesterol level. Dyslipoproteinemias, atheroscelorosis- risk factor and causes. Fatty liver.

**UNIT-III: INBORN ERRORS OF METABOLISM 20 HOURS**

Introduction - clinical importance, phenylketonuria, cystinuria, alkaptonuria, Fanconi's syndrome, galactosemia, albinism, tyrosinemia, and hemophilia. Gout, Lesch-Nyhan syndrome.

**UNIT-IV: ORGAN FUNCTION TEST 20 HOURS**

Renal function test: Clearance test – Urea, Creatinine, Inulin, PAH test, Concentration and dilution test.

Gastric function test: Collection of gastric contents, examination of gastric residum, FTM, stimulation test, tubeless gastric analysis. Liver function test: Metabolism of bilirubin, jaundice - types, differential diagnosis. Icteric index, Vandenberg test, plasma protein changes, Prothrombin Time.

**UNIT-V CLINICAL ENZYMOLOGY 15 HOURS**

Functional and non- Functional plasma enzymes.Isoenzymes with examples. Enzyme patterns in acute pancreatitis, liver damage, bone disorder, myocardial infarction and muscle wasting.

**TEXTBOOK:**

Text book of Medical Biochemistry - Dr. M.N. Chatterjee and Raneshinde

**REFERENCES:**


1. Clinical chemistry in diagnosis and treatment - Philip D. Mayne
2. Clinical chemistry – William Hoffman
3. Clinical Biochemistry with clinical correlation – Devlin, Wiley
4. Practical clinical biochemistry – Harold Varley, CBS, New Delhi
5. Clinical Biochemistry – Zoan. F, Zilva&Pannall
6. Text book of Clinical Biochemistry - Carl A. Burdis and Edward R Ashwood
7. Advanced Clinical Biochemistry- Tietz

**SEMESTER VI** **ELECTIVE – II**

## NUTRITIONAL BIOCHEMISTRY & DIETETICS

**Hours per week: 4** **Paper Code: U3BIE601**

**Total Hours: 60** **Credits: 3**

**Objective:** To understand the importance of food in health and disease management.

### UNIT – I: NUTRITION AND DIETARY HABITS 12 HOURS

Definition of foods and nutrition.Functions of food and its relation to nutritional. Basic food groups: Energy giving foods, body building foods and protective foods. Essential nutrients.

### UNIT – II: NUTRITIVE AND CALORIFIC VALUE OF FOOD 12 HOURS

Unit of energy measurements of food stuffs by Bomb calorimeter, calorific, physiological value and RQ of food stuffs. Body mass index (BMI), Basic metabolic rate (BMR), its measurements and influencing factors, SDA of food.Nutritive value of protein, essential amino acids.

### UNIT-III: COMPOSITION OF BALANCED DIET 12 HOURS

Nutrition at various stages of growth and development: Diets for infants. Children, adolescent, pregnant women, lactating mothers and older persons.RDA for average Indian.Protein malnutrition (Kwashiorkar) and undernutrition (marasmus) and their preventive, curative measures.

### UNIT-IV: DISEASE MANAGEMENT WITH DIET 12 HOURS

Nutritional therapy during Obesity, diabetes, renal diseases, anemia, peptic ulcer, constipation, jaundice, fatty liver, high blood pressure, low blood pressure, atherosclerosis, gall bladder disease, cancer, Pulmonary tuberculosis and arthritis. Dietary fibre and its therapeutic effects

### UNIT-V: FOOD HYGIENE AND HEALTH 12 HOURS

Food allergy and dietary management, Food contamination – food toxins, bacterial food poisoning, food spoilage, chemical food poisoning, food colours, preservatives, pesticides.

**TEXTBOOK:**

Food and Nutrition – Gupta.
Food and Nutrition – Swaminathan.

**REFERENCES:**


1. Clinical dietetics and nutrition - E.P. Antis.
2. Normal and therapeutic nutrition - Corinne H Robinson Marilyn R Lawler.
3. Foundation of normal and therapeutic nutrition - RandellTeltal.
4. Nutrition and dietetics - Subhangini Joshi.

5. Sprouts - ID Vaish, yoga samsthan.
6. Medical secrets of your food – Arnan.
7. Nutritive value of Indian foods - NIN B.S. NarsingaRao.
8. Human Nutrition and Dietetics - Davidson and Passamore, Eastwood.
9. Modern nutrition in health and disease – Shills.
10. Human nutrition - Maxine E.Mc.Divitt and SumatiRajgopai.
11. Superior Nutrition - Herbert M. Sheiton

**SEMESTER VI** **ELECTIVE III**

## IMMUNOLOGY

**Hours per week: 4** **Paper Code: U3BIE602**

**Total Hours: 60** **Credits: 3**

**OBJECTIVES:**To understand the organization of the immune system, how it functions and certain diseases related to its malfunctions.

### UNIT-I- INTRODUCTION & ORGANIZATION OF IMMUNE SYSTEM 20 HOURS

Introduction to immunology: Symbols, Lymphoid organs, Immunity types – Innate and acquired immunity, Innate immunity – mechanical factors, chemical factors, biological factors, and other factors. Cells of immunity – NK cells, LAK, Macrophages, Neutrophils and Eosinophils.Determinants of innate immunity. Acquired immunity – humoral and cell mediated.

### UNIT-II- ANTIGEN & ANTIBODIES 10 HOURS

Antigens: Definition, criteria for antigenicity, Epitope, Haptens. Classification of antigen based on Chemical nature, mode of action, and antigenic determinant. Antibodies: Paratope, Basic Structure, Classes, Subclasses of Immunoglobins, biological functions, Monoclonal antibodies - Production and applications.

### UNIT-III- COMPLEMENT SYSTEM 10 HOURS

Complement: Definition, components, activation, pathways of activation – classical and Alternative pathway. Biological activities of complement components.Deficiency of complement system.

### UNIT-IV- HYPERSENSITIVITY 10 HOURS

Hypersensitivity – type I, II,III and IV. Transplantation- graft and its types, mechanism of allograft rejection.

### UNIT-V- IMMUNOLOGICAL TEST 10 HOURS

Antigen Antibody Reaction: Agglutination test and its type, Precipitation, Complement fixation test, immuno assays using labelled reagents- immunofluorescence, ELISA, RIA.

Commonly used immunological test – Widal test, VDRL, Hepatitis B, Rheumatoid Arthritis.

**TEXT BOOKS:**

1. Immunology – A Short Textbook. MdAkram Hussain. Second Edition

**REFERENCES:**


1. Essential Immunology. Roitt. I.M. (1988). Blacewell Scientific Publishers.
2. Immunology, Kuby Richard. A. Goldsby, Thomas. J.Kint, Barbara. A. Osborne, 4th Edition, 2000, W.H. Freeman and Company, New York.
3. Basic and Clinical Immunology. Stites D.P. Stobo, J.D. Fundanberg. H.A and Wells. J.V. (1990) 6th edition Los Atlas Lange.
4. Immunology-Charles. A. Janeway. J.R. Paul Travels: Black well Scientific Publishers, 1994. (4th edition).
5. Immunology- JanesKuby


**SEMESTER VI** **SKILL BASED - IV**

## BIOTECHNOLOGY

**Hours per week: 4** **Paper Code: U3BISB61**

**Total Hours: 60** **Credits: 2**

**OBJECTIVES:**To understand the tools, techniques and applications of genetic engineering.

### Unit – I- GENETIC ENGENEERING TOOLS 12 HOURS

Biotechnology- definition and scope: types and branches of biotechnology. Genetic engineering tools – brief account of restriction endo nucleases, exonuclease, SI nucleases, DNA ligases, alkaline phosphatase, reverse transcriptase, DNA polymerase, poly nucleotide kinase, and terminal transferase. Uses of linkers and adapters in genetic engineering.Cloning vectors: Plasmid ($pBR^{322}$), Phage (Phage λ), Cosmid, Shuttle vector and Expression vectors.

### Unit – II- GENE TRANSFER TECHNIQUES AND AMPLIFICATION 12 HOURS

Methods of gene transfer – transformation, transfection, electroporation, and Biolistics. Screening method – insertional inactivation. Construction of genomic library and cDNA library, Southern, Northern and Western blotting techniques, Gene amplification PCR.

### Unit – III- CELL CULTURE EQUIPMENTS 12 HOURS

Equipment and requirements for plant & animal cell culture - laminar flow, $CO_2$ incubator, sterilization of glassware, shakers, fermentors, centrifuge, inverted microscope, culture room.

**Unit – IV- PLANT TISSUE CULTURE 12 HOURS**

Plant tissue culture – totipotency, explant, callus, Dedifferentiation, Media, composition, nutrients, growth regulators, initiation. Explant culture, Callus culture, organogenesis, root, shoot culture and suspension culture, somatic embryogenesis, somoclonal variation protoplast culture.

**Unit – V-GENETIC ENGINEERING APPLICATIONS 12 HOURS**

Genetic engineering for human welfare – production of insulin, TPA, factor VIII and growth hormone.

Transgenic Plants- insect resistant, herbicide resistant and stress resistant plant.Transgenic animals – transgenic sheep, fish.

**TEXTBOOKS:**

Biotechnology – U. Satyanarayanan

## REFERENCES:


1. Concept in biotechnology - D. Balasubraniam et al., Universal press India 1996.
2. Plant tissue culture - Razdan, Oxford IBH Publisher.
3. Animal cell culture – Freshney, IRL Press.
4. Animal Biotechnology – 2005. A.K. Srivastava, R.K. Singh and M.P. Yadav Oxford & IBH.
5. Molecular biotechnology 2006 – Channarayappa Univ. Press
6. Molecular Biology & Biotechnology - H.D. Kumar(1997), Vivas publishing house Pvt .Ltd
7. Molecular biotechnology – principle and application of recombinant DNA 3rd edition Bernard, R. Glick Jack, J. Pasternak 2003, Library of Congress cataloging in publication data.
8. A text book of Biotechnology – R. C. Dubey, S. Chand & co
9. Biotechnology – Prakash, S. Lohar, MJP publisher, Chennai -5
10. Fundamentals of Biotechnology- V. Kumaresan, Saras Publications.

**SEMESTER VI** **CORE PRACTICAL VI**

## ENZYMOLOGY AND CHROMATOGRAPHY

**Hours per week: 4** **Paper Code: U3BIPR61**

**Total Practical: 15** **Credits: 4**

**OBJECTIVES:**

1. To understand the principles of enzyme assays their clinical significance.
2. To understand the basic principles of paper, thin layer and column chromatography.
3. They should know the preparations of all the reagent. Estimations should be done individually.

**I. ENZYME ASSAYS**

1. Effect of pH on salivary amylase.
2. Effect of temperature on salivary amylase.
3. Effect of substrate concentration on salivary amylase.
4. Assay of activity of alkaline phosphatase in serum.
5. Assay of serum Aspartate Transaminases (SGOT).
6. Assay of serum Alaninine Transaminase (SGPT),

**II .CHROMATOGRAPHIC TECHNIQUES**

1. Separation and detection of amino acids by Paper chromatography.
2. Separation and detection of sugars by Paper chromatography.
3. Separation of plant pigments by column chromatography.
4. Separation of proteins by column chromatography.
5. Separation of amino acids by thin layer chromatography.
6. Separation of lipids by thin layer chromatography.

**TEXTBOOK:**

Medical Laboratory Technology – Kanai L. Mukherjee, Tata McGraw Hill Publication and co. ltd., Vol, I, II, III.

**REFERENCES:**


1. Practical Clinical Biochemistry - Harold Varley, CBS, New Delhi.
2. Clinical chemistry – Ranjana Chawla.
3. Laboratory Manual in Biochemistry – Jayaraman.
4. Biochemical methods – S.SadasivanAndmanickam.
5. Introduction to practical biochemistry – David T. Plummer.

**SEMESTER VI** **ELECTIVE PRACTICAL- II**

## MEDICAL LABORATORY TECHNOLOGY PRACTICAL- II

**Hours per week: 4** **Paper Code: U3BIEP61**

**Total Practical: 15** **Credits: 4**

**OBJECTIVES:**

1. To understand the basic concepts related to microbial culture, staining and testing for antibiotic sensitivity.
2. To understand the collection and analysis of urine under normal and pathological conditions.

**I. MICROBIOLOGY**

1. Sterilization & disinfection,
2. Media preparation,
3. Culture
4. Gram staining,
5. Antibiotic sensitivity testing

**II. URINE ANALYSIS**

1. Collection and preservation of urine samples
2. Qualitative analysis of urine for normal and pathological conditions.

**III. URINE ANALYSER**

Qualitative analysis of urine for normal and pathological conditions using urine analyser- demonstration.

**TEXTBOOK:**

Medical Laboratory Technology – Kanai L. Mukherjee, Tata McGraw Hill Publication and co. ltd., Vol, I, II, III.

**REFERENCES:**


1. Practical Clinical Biochemistry - Harold Varley, CBS, New Delhi.
2. Clinical chemistry – Ranjana Chawla.
3. Laboratory Manual in Biochemistry – Jayaraman.
4. Biochemical methods – S.SadasivanAndmanickam.
5. Introduction to practical biochemistry – David T. Plummer.

# *DEPARTMENT OF COMPUTER SCIENCE*

**Common to B.Sc.,(CS) / B.Sc., (S/W) / B.C.A**
**Semester V - DATABASE MANAGEMENT SYSTEM**
**(for candidates admitted from 2013-14)**

**Subject Code: U3CS5001** **Hours/Week: 5**
**Credits: 4**
**Max Marks: 100(75+25)**

**Objectives:** *To understand the concepts of Database Management System and mastering Structured Query Language*

## UNIT – I: INTRODUCTION, DATABASE DESIGN & E-R MODEL

Purpose of Database Systems – View of Data – Database Languages - Relational Databases – Database Design – Database Architecture (*Chapter 1 : Sections 1.2 to 1.6 & 1.11)* Entity Relationship model – Constraints - Entity Relationship Diagrams (*Chapter 6: Sections 6.2 to 6.4)*

## Unit –II: RELATIONAL MODEL AND OTHER RELATIONAL LANGUAGES

Structure of Relational Databases – Fundamental Relational Algebra Operations – Additional Relational Algebra Opearations - Extended Relational Algebra Operations - Null Values - Modification of the Database (*Chapter 2: Sections 2.1 to 2.6)*
The Tuple Relational Calculus – The Domain Relational Calculus (*Chapter 5: Sections 5.1 to 5.2)*

## Unit – III: SQL, INTERMEDIATE and ADVANCED SQL

Data Definition – Basic Structure of SQL Queries –Set Operations –Aggregate Functions – Null Values - Nested Sub queries – Views - Modification of the Database - Joined Relations (*Chapter 3 : Sections 3.2 to3.11)*
SQL Data Types and Schemas – Integrity Constraints - Authorization - Embedded SQL (*Chapter 4: Sections 4.1 to 4.4)*

## Unit – IV: RELATIONAL DATABASE DESIGN

Features of Good Relational Designs – Atomic Domains and First Normal Form – Decomposition using Functional Dependencies – Functional Dependency Theory - Decomposition using Multivalued Dependencies.(*Chapter7:Sections 7.1to 7.4&7.6)*

## Unit – V: SYSTEM ARCHITECTURE

Centralized and Client - Server Architecture - Server System Architecture - Parallel Systems - Distributed System. *(Chapter 20: Sections 20.1 to 20.4)*
Distributed Database Storage - Distributed Transactions - Concurrency Control in Distributed Databases - Distributed Query Processing. *(Chapter22: Sections 22.2, 22.3, 22.5, 22.7)*

**TEXT BOOK:**

Database System Concepts, Abraham Silberchatz, Henry F Korth, S.Sudarshan, McGraw-Hill - 5th Edition - 2006.

**REFERENCE BOOKS:**

1. Fundamentals of Database Systems, Elmasri and Navathe:, Pearson Education, 5th Edition 2007.
2. Database Management Systems, Raghu Ramakrishnan and Johannes Gehrke: McGraw-Hill, 3rd Ed. 2003.

**Common to B.Sc. (CS) / B.Sc., (S/W) / B.C.A.**
**Semester V - DBMS Lab**
**(for candidates admitted from 2013-14)**

**Subject Code: U3CSPR51** **Hours/Week: 3**
**Credits: 3**
**Max Marks: 100(75+25)**

1. DML Commands
2. DDL Commands
3. Built in String/Date/Aggregate Functions
4. Single Table Queries
5. Joins
6. Sub Queries
7. Set Operators
8. Multiple Table Queries
9. Programmable Objects ( Functions, Procedures, Triggers )
10. Advance Queries using AdventureWorks, Pubs, and NorthWind Databases and SqlReports.

**REFERENCE :**

**Lab Manual**

**Common to B.Sc. (CS) / B.Sc., (S/W) / B.C.A.**
**Semester V - MICROPROCESSORS AND ITS APPLICATIONS**
**(for candidates admitted from 2013-14)**

**Subject Code: U3CS5002** **Hours/Week: 5**
**Credits: 4**
**Max Marks: 100(75+25)**

**Objectives:**
*To learn the architecture, programming, interfacing and rudiments of system design of microprocessors.*

**Unit-I: 8085 MICROPROCESSOR AND ARCHITECTURE**

Microprocessors - Memory - I/O Devices - Memory Mapped I/O - Pin diagram and internal architecture of 8085 - Registers, ALU, Control & Status Registers - Instruction and Machine Cycles. Interrupts (Chapters 1 to 4 and 12)

**Unit II: PROGRAMMING THE 8085**

Introduction to 8085 Assembly language programming - 8085 instructions - Programming techniques with Additional instructions - Counters and Time Delays - Stack and Subroutines - Code Conversions ( Chapters 7 to 10 )

**Unit-III: 8086 MICROPROCESSOR AND ARCHITECTURE**

Pin Details and Internal Architecture of 8086 - Register organization, Bus interface unit, Execution unit, Memory addressing, Memory segmentation. Operating modes - Hardware and Software interrupts - Addressing Modes. (Chapter 2)

**Unit-IV: PROGRAMMING THE 8086**

8086 Assembly Language Programming - Implementing Standard Program Structures - String - Procedure and Macros. Instruction Description and Assembler Directives (Chapter 3, 4, 5 and 6)

**Unit-V: INTERFACING PERIPHERALS**

8255 PPI, 8253/8254 PIT, 8237 DMAC, 8259 PIC, 8251 USART. (Chapter 14, 15, 16)

**TEXT BOOK**

1. Microprocessor Architecture, Programming and Aplications with 8085, Ramesh S.Gaonkar, Penram International Publishing (India) Pvt. Ltd. 4th Ed. (for Units I,II and V)

2. Microprocessors and Interfacing, Douglas V. Hall, Tata McGraw Hill, 2nd Ed. (for Units III and IV)

**REFERENCE BOOKS:**

1. Assembly Language Programming the IBM PC, Alan R. Miller, Subex Inc, 1987.
2. Advanced Microprocessors and Peripherals, Ray A K, Bhurchandi K M , TMH.

**Common to B.Sc. (CS) / B.Sc., (S/W) / B.C.A.**
**Semester V – MICROPROCESSORS LAB**
**(for Candidates admitted from 2013 -2014)**

**Subject Code: U3CSPR52** **Hours/Week: 3**
**Credits: 3**
**Max Marks: 100(75+25)**

**8085:**

1. 8-bit arithmetic (Addition, Subtraction, Multiplication, Division, Square and Square Root.)
2. 16-bit arithmetic (Addition, Subtraction, Multiplication, Division, Square and Square Root.)
3. Block Operations ( Sum, Copy, Reverse, Search, Largest/Smallest, Sort ,Fibonacci Series )
4. Code Conversion (BCD/Hex to Binary/ASCII and vice versa).
5. Bit Manipulation (Count Even/odd/Positives/Negatives) and Delay Routines.

**8086:**

1. 8/16-bit arithmetic addition, subtraction, Multiplication, Division.
2. Block operations ( Sum, Average, Search, Largest/Smallest, Sort )
3. String Manipulation (Display, Case Conversion, Search, Copy, Reverse,Read )
4. BIOS routines ( Rename a File, Keyboard input )
5. Lookup Table, Bit Manipulation.

**REFERENCE:**

**Lab Manual**

**Common to B.Sc. (CS) / B.Sc., (S/W) / B.C.A.**
**Semester V - SOFTWARE ENGINEERING**
**(for candidates admitted from 2013-14)**

**Subject Code: U3CSE501** **Hours/Week: 5**
**Credits: 4**
**Max Marks: 100(75+25)**

**Objectives:**
*This course introduces the concepts and methods required for the construction of large software intensive systems.*

**Unit I: Introduction and Software Processes**

The Problem Domain- The Software Engineering Challenges -The Software Engineering Approach.
Software Process-Desired Characteristics of Software Process-Software Development Process Models-Other Software Processes

**Unit II: Software Requirement Analysis and Specification and Software Architecture**
Software Requirements-Problem Analysis-Requirement Specification-Functional Specification with Use Cases –Validation-Metrics - Role of Software Architecture-Architecture Views-Component and Connector View

**Unit III: Planning a Software Project and Function-Oriented Design**

Process Planning-Effort Estimation-Project Scheduling and Staffing-Software Consideration Management Plan-Quality Plan-Risk Management-Project Monitoring Plan Design Principles-Module Level Concepts-Design Notation and Specification-Structured Design Methodology-Verification-Metrics.

**Unit IV: Object Oriented Design and Detailed Design**
OO Analysis and OO Design-OO Concepts-Design Concepts-Unified Modeling Language- A Design Methodology-Metrics. Detailed Design and PDL-Verification-Metrics.

**Unit V: Coding and Testing**
Programming Principles and Guidelines-Coding Process-Refactoring-Verification-Metrics Testing Fundamentals-Black Box Testing-White Box Testing-Testing Process-Defect Analysis and Prevention-Metrics- (Reliability Estimation)

**TEXT BOOK :**

An Integrated Approach to Software Engineering, Pankaj Jalote, Narosa Publishing - 3rd Edition.

**REFERENCE BOOKS:**

1. Software Engineering, Richard Fairley, TMH Publication, 2012
2. Software Engineering, Ian Sommerville, Person Education Ltd, 9th Edition, 2011.

**Common to B.Sc. (CS) / B.Sc., (S/W) / B.C.A.**
**Semester V - DESIGN AND ANALYSIS OF ALGORITHMS**
**(for candidates admitted from 2013-14)**

**Subject Code: U3CSE502** **Hours/Week: 5**
**Credits: 4**
**Max Marks: 100(75+25)**

**Objectives:** *To build a solid foundation of the most important fundamental subject in computer science. Creative thinking is essential to algorithm design and mathematical acumen and programming skills.*

**UNIT -I: INTRODUCTION**

What is an Algorithm? - Algorithm Specification- Performance Analysis- Randomized Algorithms. *(Chapter 1)*

**UNIT - II: DIVIDE AND CONQUER**

General Method - Binary Search - Finding the Maximum and Minimum-Merge Sort - Quick Sort - Selection Sort- Stassen's Matrix Multiplications. *(Chapter 3: Sections 3.1 to 3.7)*

**UNIT - III: THE GREEDY METHOD**

The General Method - Knapsack Problem – Tree Vertex Splitting - Job Sequencing with Deadlines- Minimum Cost Spanning Trees - Optimal Storage on Tapes - Optimal Merge Pattern - Single Source Shortest Paths.*(Chapter 4)*

**UNIT - IV: DYNAMIC POGRAMMING**

The General Method – Multistage Graphs - All pair shortest path - String Editing - 0/1 Knapsack – Reliability Design - The Traveling Salesperson Problem - *(Chapter 5: Sections 5.1 to 5.3,5.6 to 5.9)*

**UNIT - V: TRAVERSAL, SEARCHING & BACKTRACKING**

Techniques for Binary Trees- Techniques for Graphs - The General Method - The 8-Queens Problem – Sum of Subsets- Graph Coloring- Hamiltonian Cycles.*(Chapter 6, Section 6.1,6.2 Chapter 7:Sections 7.1 to 7.5)*

**TEXT BOOK**

Fundamentals of Computer Algorithms, Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, GalgotiaPublications, 1998.

**REFERENCE BOOKS:**

1. Introduction to Algorithms, Coremen T.H., Leiserson C.E. and Rivest R.L., PHI 1998.
2. Introduction to the Design and Analysis of Algorithms, Anany Levitin, Pearson Education, 2nd Edition.

**Common to B.Sc. (CS) / B.Sc., (S/W) / B.C.A.**
**Semester V – MOBILE APPLICATION DEVELOPMENT LAB**
**(for Candidates admitted from 2013 -2014)**

**Subject Code: U3CSSB51** **Hours/Week: 4**
**Credits: 3**
**Max Marks: 100(75+25)**

1. Intent and Activity
2. Using Controls
3. Alert Dialogs
4. List View
5. Options Menu
6. Seek Bars
7. Shared Preferences
8. Status Bar Notifications
9. Tab Widgets Talking Clock.
10. Tween Animation

11. Grid View

12. Internal Storage - Files

13. SQlite - Database

14. Google Map

15. Permissions

**REFERENCE:**

**1. Lab Manual**

2. Professional Android 4 Application Development, Reto Meier, Wiley-India

**Common to B.Sc. (CS) / B.Sc., (S/W) / B.C.A.**
**Semester VI - OPERATING SYSTEM**
**(For candidates admitted from 2013-14)**

**Subject Code: U3CS6001** **Hours/Week: 5**
**Credits: 4**
**Max Marks: 100(75+25)**

**Objectives:**
*To learn the various aspects of the internal operation of modern operating systems such as process management, threads, mutual exclusion, CPU scheduling, deadlock, memory management, and file systems.*

**UNIT – I: INTRODUCTION & OPERATING SYSTEM STRUCTURES**

What is an Operating System? - Mainframe Systems-Desktop Systems-Multiprocessor Systems-Distributed Systems-Clustered Systems-Real-Time Systems-Handheld Systems (*Chapter 1: Sections 1.1 to1.8)* System Components-Operating System Services-System Calls-System Programs *(Chapter 3: Sections 3.1 to 3.4)*

**UNIT – II: PROCESSES, CPU SCHEDULING & DEADLOCKS**

Process Concept-Process Scheduling-Operations on Processes-Cooperating Processes-Interprocess Communication (*Chapter 4: Sections 4.1 to 4.5)* Basic Concepts-Scheduling Criteria-Scheduling Algorithms (*Chapter 6: Sections 6.1, 6.2, 6.3)* Deadlock Characterization-Methods for Handling Deadlocks-Deadlock Prevention-Deadlock Avoidance-Deadlock Detection-Recovery from Deadlock (*Chapter 8: Sections 8.2 to 8.7)*

**UNIT – III: STORAGE MANAGEMENT AND VITUAL MEMORY**

Swapping-Contiguous Memory Allocation-Paging-Segmentation (*Chapter 9: Sections 9.2 to 9.5)* Demand Paging-Page Replacement (*Chapter 10: Sections 10.2, 10.4)*

**Unit – IV: FILE SYSTEM INTERFACE, FILE SYSTEM MPLEMENTATION, MASS- STORAGE STRUCTURE**

File Concept-Access Methods-Directory Structure (*Chapter 11 : Sections 11.1,11.2,11.3)*Allocation Methods-Free Space Management (*Chapter 11 : Sections 12.4,12.5)* Disk Structure-Disk Scheduling-Disk Management-Disk Attachment (*Chapter 12 : Sections 14.1,14.2,14.3,14.6)*

**Unit – V: PROTECTION AND SECURITY**

Goals of Protection-Domain of Protection-Access Matrix-Implementation of Access Matrix (*Chapter 18 : Sections 18.1 to18.4)* The Security Problem -User Authentication-Program Threats-Cryptography-Computer Security Classifications *(Chapter 19: Sections 19.1,19.2,19.3,19.7,19.8)*

**TEXT BOOK:**

Operating System Concepts, Silbershatz, Galvin, Gange, John Wiley &Sons Inc ,6th Edition, Dec 2011. .

**REFERENCE BOOKS:**

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1. Operating Systems – Internals and Design Principles, William Stallings - Pearson, 6th Edition, 2012
2. Operating Systems – A Concept Based Approach- Dhananjay M. Dhamdhere, Tata McGraw – Hill, 3rd Edition 2012

**Common to B.Sc. (CS) / B.Sc., (S/W) / B.C.A.**
**Semester VI - UNIX AND OPERATING SYSTEM LAB**
**(For candidates admitted from 2013-14)**

**Subject Code: U3CSPR61** **Hours/Week: 3**
**Credits: 3**
**Max Marks: 100(75+25)**

1. Create process (Child, Zombie, Orphan).
2. Inter Process Communication (Pipes, Message Queues and Semaphores)
2. Shell Programming ( loops, patterns, expansions, substitutions, matching, searching )
3. Implement the various process scheduling (FCFS, SJF, Priority, Round Robin).
4. Implement Memory allocation strategies ( FirstFit, BestFit and WorstFit)
5. Implement Page Replacement Algorithms (FIFO, LRU, Optimal)
6. Implement Disk Scheduling Algorithms (FIFO, SSTF and SCAN)

**REFERENCE :**

**Lab Manual**

**Common to B.Sc. (CS) / B.Sc., (S/W) / B.C.A.**
**Semester VI – OPEN SOURCE PROGRAMMING**
**(for Candidates admitted from 2013 -2014)**

**Subject Code: U3CS6002** **Hours/Week: 5**
**Credits: 4**
**Max Marks: 100(75+25)**

**Objectives:**
To discuss techniques that can be effectively applied in practice about HTML5, JavaScript, PHP, CSS and Python.

**UNIT I: INTRODUCTION TO HTML5, JAVA SCRIPT, PHP AND CSS**

Introduction to Dynamic Web content- HTTP and HTML- Request and Response Procedure- The Benefits of PHP, JAVA Script, CSS, and HTML5- Introduction to HTML5- The Canvas -The HTML5 Canvas- HTML5 Audio and Video- Introduction to

CSS- CSS Rules-Style Types- CSS Selectors- CSS Colors. (Chapter 1: Page no 1to 6, 7 to 9, Chapter 19: Page no. 423, 424, 426 to 435 and 447, 448, Chapter 22: Page no. 509,510,513)

**UNIT II: PHP INCORPORATING PHP WITHIN HTML**

The Structure of PHP- Expressions- Operators – Conditionals – Looping – PHP Functions- PHP Objects – PHP Arrays (Chapter: 3 page no: 48 to 66, Chapter 4: Page No: 73 to 98 , Chapter 5: Page No: 104 to 111, 113 to 118 , Chapter 6: Page No: 131 TO 134)

**UNIT III: EXPLORING JAVA SCRIPT**

Java Script and HTML Text- Using Comments- Semicolons – Variables- Operators- Functions- Global Variables, Local Variables - Expressions and Control Flow in Java Script : Expressions – Literal and Variables- Operators - Java Script Functions - Java Script Objects
(Chapter 14: Page No:323 to 336) (Chapter 15: Page No: 343 to 347,) (Chapter 16: Page No: 363 to 370)

**UNIT IV: JAVA SCRIPT ARRAYS AND AJAX**

Java Script Arrays: Numeric Arrays – Associative Arrays – Multidimensional Arrays – Using Array Methods - What is Ajax? – Using XML HTTP Request (Chapter 16: Page No: 372 – 376) Chapter 18: Page No: 405 to 420)

**UNIT V: PYTHON- BEGINNING TO USE PYTHON**
Strings- Quotes – Numbers and Operators – Variables – Making Decisions – Functions (Chapter 1: Page No: 7 to 12) Chapter 2: Page No15 to 25) Chapter 3: Page no 31to 42) Chapter 4: Page No: 51 to 57) (Chapter 5: Page No: 71 to 87)

TEXT BOOKS:

1. "Learning PHP, MySQL, Java Script, CSS and HTML5", Robin Nixon, O'Reilly Publications, 3rd Edition, 2014.
2. Beginning Python, James Payne, Wiley Publication, 1st Edition, 2010.

REFERENCE BOOKS:

1. Learning JavaScript, Tim Wright, Pearson Education Inc, 2013.
2. Programming PHP , Rasmus Lerdorf and Levin Tatroe, O'Reilly Publications, 2002

**Common to B.Sc. (CS) / B.Sc., (S/W) / B.C.A.**
**Semester VI – Open Source Programming Lab**

**(for Candidates admitted from 2013 -2014)**

**Subject Code: U3CSPR62** **Hours/Week: 3**
**Credits: 3**
**Max Marks: 100(75+25)**

1. HTML (Frames, Links, Tables, ImageMap, Audio/Video and other tags)
2. CSS (inline, external, embedded)
3. JavaScript (Form validation)
4. Random number generation using PHP.
5. Any online application with database access.
6. PHP Program - Arrays Manipulation
7. Ajax and XML
8. Sample web application development in the Open Source Environment.
9. Python Programs- Making Decisions
10. Python Programs- Functions

**Common to B.Sc. (CS) / B.C.A.**
**Semester VI – CLOUD COMPUTING**
**(for Candidates admitted from 2013 -2014)**

**Subject Code: U3CSE601** **Hours/Week: 5**
**Credits: 4**
**Max Marks: 100(75+25)**

**Objectives:**

*To impart the knowledge of cloud computing concepts for the better understanding and benefits of the students*

**Unit – I: First Drive and Cloud Models**

Introduction - Benefits - Why Cloud? - Business and IT Perspective - Cloud and Virtualization - Cloud Services Requirements - Cloud and Dynamic Infrastructure - Cloud Computing Characteristics - Cloud Adoption - Measured Service - Cloud Models -

Security in a Public Cloud - Public versus Private Clouds - Cloud Infrastructure Self Service
(Chapter 1: Sections 1.1 to 1.10 & Chapter 2: Sections 2.3 to 2.7)

**Unit – II: Cloud as a Service and Cloud Solutions**

Gamut of Cloud Solutions - Principal Technologies - Cloud Strategy - Cloud Design and Implementation using SOA - Conceptual Cloud Model - Cloud Ecosystem - Cloud Business Process Management - Cloud Service Management - Cloud Stack - Computing on Demand (CoD) - Cloud sourcing
(Chapter 3: Sections 3.2 to 3.6 & Chapter 4.2 to 4.7)

**Unit – III: Cloud Offerings and Cloud Management**

Information Storage, Retrieval, Archive and Protection - Cloud Analytics - Testing under Cloud - Information Security - Virtual Desktop Infrastructure - Storage Cloud - Resiliency - Provisioning - Asset Management - Cloud Governance - High Availability and Disaster Recovery - Charging Models, Usage Reporting, Billing and Metering
(Chapter 5: Sections 5.2 to 5.7 & Chapter 6: Sections 6.2 to 6.7)

**Unit – IV: Cloud Virtualization Technology**

Virtualization Defined - Virtualization Benefits - Server Virtualization - Virtualization for x86 Architecture - Hyper visor Management Software - Logical Partitioning (LPAR) - VIO Server - Virtual Infrastructure Requirements - Storage virtualization - Storage Area Networks - Network-Attached storage
(Chapter 7: Sections 7.2 to 7.8 and Chapter 8: Sections 8.2 to 8.4)

**Unit – V: Cloud Virtualization and SOA**

Cloud Server Virtualization - Virtualized Data Center - SOA Journey to Infrastructure - SOA and Cloud - SOA Defined - SOA and IaaS - SOA-based Cloud Infrastructure Steps - SOA Business and IT Services
(Chapter 8: Sections 8.5 to 8.6 & Chapter 9: Sections 9.2 to 9.7)

**TEXT BOOK:**

Cloud Computing, Dr. Kumar Saurabh, Wiley India, 2011

REFERENCES BOOKS:
Cloud Computing, Raj Kumar Buyya, Wiley publication, 2014.

**B.Sc., (Software Computer Science)**
**Semester VI – SOFTWARE TESTING**
**(for Candidates admitted from 2013 -2014)**

**Subject Code: U3SWE601** **Hours/Week: 5**
**Credits: 4**
**Max Marks: 100(75+25)**

**Objectives:**
*To discuss techniques that can be effectively applied in practice, present object-oriented testing and emphasize testing web applications and automated test data generation techniques.*

**UNIT - I: INTRODUCTION**

Some Software Failures - Testing process – Some Terminologies - Limitations of Testing - The V Shaped Software Life Cycle Model: - *(Chapter 1: sections 1.1 to 1.5)*

**UNIT - II: FUNCTIONAL TESTING AND ESSENTIALS OF GRAPH THEORY**

Boundary Value Analysis - Equivalence Class Testing - Decision Table Based Testing *(Chapter 2: Sections 2.1 to 2.3,)* - What is a Graph? – Matrix Representation of Graphs - Generation of a Graph from Program – Identification of Independent paths *(Chapter 3: Sections 3.1, 3.2, 3.4, 3.5)*

**UNIT - III: STRUCTURAL TESTING AND SOFTWARE VERIFICATION**

Control Flow Testing – Data Flow Testing – Slice Based Testing – Mutation testing. *(Chapter 4: Sections 4.1 to 4.4)* – Verification Methods – Software Requirement Specification (SRS) Document Verification – Software Design Description (SDD) Document Verification – Source Code Reviews – User Documentation Verification – Software Project Audit *(Chapter 5: Sections 5.1 to 5.6)*

**UNIT - IV: SOFTWARE TESTING ACTIVITIES AND OBJECT ORIENTED TESTING**
Levels of Testing – Debugging – Software Testing Tools – Software Test Plan *(Chapter 8: Sections 8.1 to 8.4)* - What is Object Orientation? – What is Object Oriented Testing? – Path Testing – State Based Testing – Class Testing. *(Chapter 9: Sections 9.1 to 9.5)*

**UNIT – V: TESTING WEB APPLICATIONS**
What is Web Testing? – Functional Testing – User Interface Testing – Security Testing - Performance Testing – Database Testing – Post-Deployment Testing – Web Metrics. *(Chapter 11: Sections 11.1 to 11.3, 11.6 to 11.10).*

**TEXT BOOK:**

Software Testing, Yogesh Singh, Cambridge University Press, 1st Edition, 2013

**REFERENCE BOOKS:**

1. Software Testing A Craftmans Approach, Paul C Jourgensen, Aueredach Publications, 3rd Edition, 2011.

2. Foundations of Software Testing – Fundamental Algorithms and Techniques, Adithya P.Mathur, Pearson Education India, 2011

**Common to B.Sc. (CS) / B.Sc., (S/W) / B.C.A.**
**Semester VI – COMPUTER GRAPHICS**
**(for Candidates admitted from 2013 -2014)**

**Subject Code: U3CSE602** **Hours/Week: 5**
**Credits: 4**
**Max Marks: 100(75+25)**

**Objectives:** *To equip students to basics of computer drawing and prepare them for computer modeling of objects*

**UNIT – I: OVERVIEW OF GRAPHICS SYSTEMS AND OUTPUT PRIMITIVES**

Video Display Devices- Raster Scan System- Random Scan Systems- Hard Copy Deices- Graphic Software- Line Drawing Algorithms: DDA- Bresenham's Line -Circle Generating Algorithms- Ellipse Generating Algorithms
*(Chapter 2: Sections 2.1, 2.2, 2.3, 2.6, 2.7, Chapter 3: Sections 3.2, 3.5, 3.6)*

**UNIT – II: ATTRIBUTES AND TWO DIMESIONAL TRANSFORMATIONS**

Line Attributes- Curve Attributes-Color And Gray Scale Level- Area Fill Attributes- Character Attributes- Inquiry Functions- Basic Transformations - Composite Transformation – Other transformation *( Chapter 4 : Sections 4.1 to 4.5,4.7, Chapter 5: Sections 5.1,5.3,5.4)*

**UNIT – III: TWO DIMENSIONAL VIEWING AND CLIPPING**

The Viewing Pipeline- Window To Viewport Transformation –Clipping Operations- Point Clipping- Line Clipping: Cohen Sutherland- Liang Barsky-Sutherland Hodgeman

Polygon Clipping- Text Clipping- Exterior Clipping- Logical Classification Of Input Devices- Interactive Picture Construction Techniques *(Chapter 6 : Sections 6.1,6.3,6.5,6.6,6.7,6.8,6.10,6.11, Chapter 8 : Sections 8.2,8.5)*

**UNIT – IV: THREE DIMENSION TRANSFORMATION, VIEWING AND CLIPPING**

Translation-Rotation-Scaling-Viewing Pipeline- Viewing Coordinates- Projections -View Volumes and General Projection Transformation- Clipping -
*(Chapter 11: Sections 11.1, 11.2, 11.3, Chapters12: Sections 12.1 to 12.5)*

**UNIT – V: VISIBLE SURFACE DETECTION METHODS**

Classification of Visible Surface Detection Algorithms - Back Face Detection - Depth Buffer Method - A Buffer Method - Scan Line Method - Depth Sorting Method- BSP Tree Method -Area Sub Division Method - Octree Methods - Ray Casting Method *(Chapter 13 : Sections 13.1,-,13.10)*

**TEXT BOOK:**

Computer Graphics(C version), Donald Hearn and M.Pauline Baker, Pearson- 2nd Edit. 2012.

**REFERENCE BOOKS:**

1. Interactive Computer Graphics–A top down approach using Open GL, Edward Angel, Pearson, 5th Edition.

2. Computer Graphics, Peter Shirley, Steve Marschner, Cengage Learning, Indian Edition, 2009.

**Common to B.Sc. (CS) / B.Sc., (S/W) / B.C.A.**
**Semester VI – Comprehensive Exam on Computer Science / Computer Application/ Software Development Skills**
**(for Candidates admitted from 2013 -2014)**

**Subject Code: U3CSSB61 for B.Sc. Computer Science**
**U3SWSB61 for Software Development Skill**
**U3CSSB61 for B.Sc. Computer Application**

**Hours/Week: 4**
**Credits: 4**
**Max Marks: 100(75+25)**

***Objective type questions from Computer Science / Computer Application / Software Computer Science subjects studied from first semester onwards.***

Contents:

1. Digital Logic Fundamentals
2. Programming in C
3. Object Oriented Programming with C++
4. Data Structures
5. Java Programming
6. Computer Networks
7. Database Management System
8. Microprocessor and its Applications.
9. Software Engineering
10. Design and Analysis of Algorithm
11. Operating System.
12. Open Source Technologies
13. Computer Graphics
14. Recent Trends in Information Technology
15. General Programming Skills.