

**ISLAMIAH COLLEGE (AUTONOMOUS)**

**VANIYAMBADI**

**CIA TEST II –MARCH 2020**

Time: 3 Hrs    Max. Marks: 75

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Class: IIM.Sc Physics Semester IV    Sub. Code: P8PY4001

**CONDENSED MATTER PHYSICS II**

**SECTION-A (5 X6= 30 Marks)**

**Answer ALL the Questions**

1. (a) Explain the experimental method of determining dielectric constant of a material.

(OR)

(b) Calculate the dielectric constant of titarite crystal which, when inserted in a parallel plate capacitor of area  $10 \times 10 \text{ mm}^2$  and distance of separation 2 mm gives a capacitance of  $10^{-9} \text{ F}$ .

2. (a) Deduce an equation for Quantum theory of diamagnetism.

(OR)

(b) Discuss adiabatic demagnetization in paramagnetic salts.

3. (a) Explain the Heisenberg's interpretation of Weiss field.

(OR)

(b) Brief the spin coupling phenomenon in ferromagnetism.

4. (a) Deduce and explain the Kramer's-Kronig relation

(OR)

(b) Explain in details about electroluminescence.

5. (a) Discuss briefly about LEED.

(OR)

(b) Explain the surface polarization.

**SECTION-B (3 X 15 = 45 Marks)**

Answer any **THREE** the Questions

6. Explain the different types of polarization and hence discuss the frequency and temperature effect on polarization.

7. Explain in detail the Quantum theory of Paramagnetism.

8. Discuss briefly about Quantum theory of Ferromagnetism.

9. Obtain the Drude relation for Optical conductivity.

10. Explain surface electronic states and obtain an expression for thermionic emission.

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[Mr.PM] (10 Copies)

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**CIA TEST II –MARCH 2020**

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**Class: II M.Sc Physics    Semester IV    Sub. Code: P8PY4002**

**RESEARCH METHODOLOGY**  
**SECTION-A (5 X6= 30 Marks)**  
**Answer ALL the Questions**

1. (a) Explain the meaning and objective of research.  
(OR)  
(b) Discuss methods versus methodology.
2. (a) Why literature survey is required in quality research?  
(OR)  
(b) What are the techniques involved in defining a problem?
3. (a) Write short note on the needs and salient features of good research design.  
(OR)  
(b) Explain the uses of computers in research.
4. (a) Define mean, median and mode with example.  
(OR)  
(b) Discuss mean and standard deviation with example.
5. (a) What is the meaning of research report?  
(OR)  
(b) Explain the steps involved in drafting report.

**SECTION-B (3 X 15 = 45 Marks)**  
**Answer any THREE the Questions**

6. Discuss the various types, approaches and significance of research.
7. Discuss briefly about the selecting and necessity of defining the problem.
8. Write in detail about the basic principles of experimental design.
9. What is Chi-square test? Mention the conditions to be satisfied for applying chi square test.
10. Discuss in detail the logical format of writing the thesis and a research paper.

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[Mr. PM &GSF] (10 copies)

**Time: 3 HrsMax. Marks: 75**

**Class: II M.Sc Physics Semester III Sub. Code: P8PYE401**

**MICROPROCESSOR AND MICROCONTROLLER**

SECTION-A (5 X 6 = 30 Marks)

Answer **ALL** the Questions

1. a) Explain the interrupts in 8085.  
(OR)  
b) Explain timing diagrams- instructions cycle in 8085.
2. a) Describe the instruction set of 8085.  
(OR)  
b) Explain the addressing modes of the 8085 microprocessors.
3. a) Draw the Interrupt pointer table of microprocessor 8086.  
(OR)  
b) Explain in detail about Minimum and Maximum mode system in 8086.
4. a) Explain different string instructions available in microprocessor 8086  
(OR)  
b) Explain the addressing modes of the 8086 microprocessors.
5. a) Explain serial communication in microcontroller 8051.  
(Or)  
b) Explain different Arithmetic instructions in 8051.

PART-B (3x15=45)

Answer any **THREE** questions

6. Explain the internal architecture of 8085 with block diagram.
7. Explain, 2K X8,4K X 8 RAM interfacing in microprocessor 8085?
8. Explain different types of interrupts in 8086.
9. Discuss in detail arithmetic, logic, shift, rotate instructions 8086.
10. What are the addressing modes of 8051 microcontroller? Explain each addressing modes with an example.

[Mr. GSF]

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**CIA TEST II – MARCH 2020**

TIME : 3 Hrs

MAX. MARKS: 75

Class: II M.Sc Physics

Semester- IV

Sub. Code: P8PYNM41

**Subject Name: BIO-MEDICAL INSTRUMENTATION**

**PART - A (5 X 6 = 30 MARKS)**

**Answer ALL Questions**

1. (a) Explain the principle and construction of thermistor.  
(OR)  
(b) Write a note on capacitive transducers.
2. (a) Explain the function of a digital conductivity meter.  
(OR)  
(b) Draw the block diagram of digital frequency counter and describe its function briefly.
3. (a) Briefly discuss the concepts of gas and liquid chromatography.  
(OR)  
(b) Draw the block diagram of FT- IR spectrometer and explain its function briefly.
4. (a) Write a note on sources of bio-electric potentials.  
(OR)  
(b) Explain the function of a physiological transducer to measure the body temperature.
5. (a) Draw the block diagram of X-ray machine and discuss its operation.  
(OR)  
(b) Explain X-ray image intensifier television system.

**PART - B (3 X 15 = 45 MARKS)**

**Answer any THREE Questions**

6. Derive an expression for Electrical strain gauge.
7. Explain the working of the following with necessary diagrams.  
(a) Digital pH meter.  
(b) Digital storage oscilloscope.
8. Write the principle of UV-VIS spectroscopy. Describe the construction and working of a UV-VIS spectrometer with block diagrams.
9. State the principle and describe the working of an EEG recorder with suitable block diagrams.
10. Describe the principle and operation of X-ray tomography.

[Mr.GSF& AAB]

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