# ISLAMIAH COLLEGE (AUTONOMOUS) VANIYAMBADI 

## CIA-IIMARCH 2020

Time: 3 Hours Max. Marks: 75
Class :III B.Sc. PHY.Sem : VISub.Code : U5PYE601

## MICROPROCESSOR AND ITS APPLICATIONS- 8085

PART A - ( $10 \times 2=20$ marks $)$

## Answer ALL Questions

1. Give the different register pairsinmicroprocessor 8085 ?
2. Which interrupt has highest priority?
3. Write the instructions of stack.
4. Define machine cycle
5. Draw the T state diagram for the instruction DCR C.
6. Give format of the instruction in programme?
7. What is DMA?
8. Write the two types of I/O interfacing
9. Give the concept of D/A conversion.
10. Name the two function modes of PPI 8255 IC in microprocessor 8085

## PART - B (5 X 5 = 25 MARKS)

## Answer ALL Questions

11(a). Calculate how many memory locations canaddress by a16 bit address bus inmicroprocessor 8085 .

## (or)

(b). Discuss the flag structure in microprocessor 8085
12. (a) Explain logical rotate instructionswith an example?
(b)Assume $(\mathrm{A})=79_{\mathrm{H}}(\mathrm{B})=68_{\mathrm{H}}$. After executing ADD B instruction, what will be the content of A register and status of flags of microprocessor 8085?
13. (a) Write adelay subroutine to generate a time delay of 1 ms using single register.
(or)
(b) Draw the timing diagram for memory write cycles
14. (a) Compare peripheral I/O and memory mapped I/O
(or)
(b). Explain the procedure to reset and display the flags.
15. (a) Explain interfacing of successive approximation $A / D$ converter.(or)
(b) Explain the interfacing of D/A converter to 8085 .

## PART C - ( $\mathbf{3 \times 1 0 = 3 0}$ marks)

## Answer Any TEREE Questions

16. With neat block diagram, explain different registers used in $\mu \mathrm{p} 8085$.
17. Explain the following instructions in $\mu \mathrm{p} 8085$ with examples.
(a)MOV A, B (b) ADI DATA (c) ANIDATA (d)RRC
(e) CALL
18. Describe $2 \mathrm{~K} \times 8,4 \mathrm{~K} \times 16$ RAM interfacing with $\mu \mathrm{p}$ 8085.
19. Explain how DMA controller is used to transfer of data.
20. Explain interfacing of ports of programmable peripheral interfacing device 8255 with LED's to run various counters.
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# ISLAMIAH COLLEGE (AUTONOMOUS) VANIYAMBADI 

## CIA-IIMARCH 2020

Time: 3 Hours
Max. Marks: 75
Class : III B.Sc. PHY. Sem : VISub.Code $\mathbf{Z}^{\mathbf{U}} \mathbf{5 P Y} 6001$

## Subject Name NUCLEAR AND PARTICLE PHYSICS

PART A - ( $\mathbf{1 0 \times 2 = 2 0} \mathbf{~ m a r k s ) ~}$
Answer ALL Questions

1. What are isotones and isomers?
2. Write some magic numbered nuclei.
3. Give the characteristics of $\alpha$-rays.
4. What is k-Capture?
5. List out the limitations of Cyclotron?
6. Define thermo luminescence.
7. What are fast neutrons?
8. Do you know which factor used to maintain chain reaction?
9. What is a Baryon made up of?
10. Give the antiparticles of electron and neutrino.

## PART B $-(5 \times 5=25 m a r k s)$

## Answer ALL Questions

11. (a) Explain the constitution of a nucleus from proton neutron hypothesis of a nucleus (or).
(b).Give a short account of the nuclear radius, nuclear mass, atomic mass unit and binding energy?
12. (a)Identify the nuclei that result from the positive and negative beta decay of ${ }_{90} \mathrm{Th}^{234}$ (or)
(b).State and explain Geiger-Nuttall law.
13. (a).Explain construction and working of a linear reactor?
(or)
(b) Distinguish between Geiger - Muller counter \& scintillation counter
14.(a) Explain construction of a breeder reactor (or)
(b) Write a note on energy balance in nuclear reaction and its Q value?
14. (a). Which are the laws conserved or violated in the following reactions?
(a) $n \rightarrow p+\bar{e}+v_{e}$
(b) $\lambda^{0} \rightarrow p+\Pi^{-}$ (or)
(b). Write a note on basic ideas of quark?

## PART C - ( $\mathbf{3 \times 1 0} \mathbf{~ = ~} \mathbf{3 0}$ marks) <br> Answer Any THREE Questions

16.Explain the liquid drop model of the nucleus and obtain the Weizacker's semi - empirical mass formula. What are its merits and demerits?
17. Briefly explain
i) internal conversion, ii) nuclear isomerism
18. Give the construction and working of the Betatron.

Mention its advantages?
19.Explain i) different types of nuclear reactions?
ii)different conservation laws of nuclear reactions?
20. Classify elementary particles and their interactions. Illustrate with examples.

# ISLAMIAH COLLEGE (AUTONOMOUS) VANIYAMBADI 

## CIA II

MARCH 2020

Time: 3 Hours

Max. Marks: 75

## Class : III B.Sc.Phy. Sem : VI Sub.Code: U5PY6003

## Subject Name: NUMERICAL METHODS AND C PROGRAMMING

## SECTION A - (10 x 2 = 20 marks) <br> Answer ALL Questions

1. State a sufficient condition for Gauss - Jacobi method to converge.
2. Find the roots of the cubical equation $\lambda 3-7 \lambda 2+14 \lambda-8=0$
3. Write the divided difference table for

| $x$ | 30 | 35 | 45 | 55 |
| :--- | :--- | :--- | :--- | :--- |
| $y$ | 148 | 96 | 68 | 34 |

4. Obtain the interpolation quadratic polynomial for the given data by Newton's forward difference formula.

| $x$ | 0 | 2 | 4 | 6 |
| :--- | :--- | :--- | :--- | :--- |
| $y$ | -3 | 5 | 21 | 45 |

5. Using trapezoidal rule evaluate $\int_{0}^{\pi} \sin x d x$ by dividing the range into 6 equal parts.
6. In order to evaluate by Simpson's $1 / 3$ rule as well as by Simpson's $3 / 8$ rule. What is the restriction on the number of intervals.
7. Define logical operators in C.
8. Define variables.
9. What is meant by go to statement?

10 . What is the importance of break in C program?

## SECTION B-(5 x 5 = $\mathbf{2 5}$ marks)

## Answer ALL Questions

11. (a) Solve the following simultaneous equations by Gauss - Jordan method.

$$
\begin{aligned}
& 2 x_{1}+x_{2}+4 x_{3}=4 \\
& x_{1}-3 x_{2}-x_{3}=-5 \\
& 3 x_{1}-2 x_{2}+2 x_{3}=-1
\end{aligned}
$$

(Or)
(b) Find the unknowns by Gauss-Seidal iteration method..

$$
\begin{aligned}
& 8 x+y+z=8 \\
& 2 x+4 y+z=4 \\
& x+3 y+5 z=5
\end{aligned}
$$

12. (a) Find the equation of the parabola passing through the points $(0,0)(1,1)$ and $(2,20)$ using Lagrange's formula.
(Or)
(b) Find the cubic polynomial from the following table using Newton's divided difference formula and hence find $\mathrm{f}(4)$.

| $x$ | 0 | 1 | 2 | 5 |
| :--- | :--- | :--- | :--- | :--- |
| $y f(x)$ | 2 | 3 | 12 | 147 |

13. (a) Using Trapezoidal rule evaluate.
$\int_{2}^{3.2} \int_{1}^{2.6}\left[\frac{1}{x+y}\right] d x d y$ taking 4 subintervals.
(Or)
(b) Solve using Simpson's $1 / 3$ rule.
$\int_{0}^{2} \frac{d x}{x^{3}+x+1}$ dividing into 8 equal parts.
14. (a) What are library functions in C. Explain in detail.
(Or)
(b) How will you classify data types?
15. (a) Explain the data input and output functions.
(Or)
(b) How will you use loop in C program.

## SECTION C - ( $3 \times 10=30$ marks)

## Answer Any THREE Questions.

16. Find the Eigen values and Eigen vectors of the given symmetric $\operatorname{matrix} A=\left[\begin{array}{lll}0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0\end{array}\right]$
17. The population of a town in the census is a given in the data. Estimate the population in the year 1996 using Newton's backward interpolation formula.

| Year $x$ | 1961 | 1971 | 1981 | 1991 | 2001 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Population (in 1000s) y | 46 | 66 | 81 | 93 | 101 |

18. Given $\frac{d y}{d x}=x y+y^{2} y(0)=1$ find $y(0.1)$ and $y(0.2)$ using Runge Kutta method of fourth order.
19. List out the various types of statements in C program in detail. 20. Write down the program for addition and comparison.
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## ISLAMIAH COLLEGE [AUTONOMOUS] <br> VANIYAMBADI <br> CIA TEST II - MARCH2020

## TIME : 3Hrs MAX. MARKS: 75

Class : III-BSc PHY Semester-VI Sub. Code: U5PY6002

## QUANTUM MECHANICS AND MATHEMATICALPHYSICS

## SECTION A-(10 x $2=20$ marks $)$

Answer ALL Questions

1. Can you define wave velocity and group velocity.
2. What are expectation values?
3. Give Schroedinger's time dependent and independent equation.
4. Define zero-point energy.
5. Find the inverse of the matrix $A=\left|\begin{array}{cc}1 & 2 \\ -1 & 2\end{array}\right|$
6. Find the characteristic equation of the matrix $A=\left[\begin{array}{ccc}1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4\end{array}\right]$
7. Find div and curl of the function for $\mathbf{F}=3 \vec{i}+2 \vec{j}+\vec{k}$ and $\mathbf{r}=4 \vec{i}+5 \vec{j}+6 \vec{k}$
8. Calculate the work done by a force $\mathbf{F}=\vec{i}+2 \vec{j}+3 \vec{k}$ acting at a point $4 \vec{j}+5 \vec{k}$
9. State Beta and gamma functions?
10. What are Dirac delta functions.

## SECTION B - ( $5 \times 5=25$ marks $)$ <br> Answer ALL Questions

11. (a) Explain briefly the construction of a wave packet.
(b) State and briefly explain the postulates of wave mechanics.
12. (a) Derive Schrodinger'stime dependent and independent equation
(b) Derive the expression for energy in the case of particle in one dimensional box.
13. (a) By matrix method solve the equations.
$x+y+z=6, x-y+2 z=5$ and $3 x+y+z=8$
(Or)
(b) Find the inverse of the matrix by Caley-Hamilton theorem for

$$
A=\left[\begin{array}{rrr}
1 & 1 & -2 \\
-1 & 2 & 1 \\
0 & 1 & -1
\end{array}\right]
$$

14. (a) Explain Line integral, surface integral and volume integral.

> (Or)
(b) State and Prove Green's theorem.
15. (a) Derive the relation between beta and gamma functions.
(b) State the properties of Dirac delta functions.

## SECTION C-( $\mathbf{3} \times 10=30$ marks $)$ <br> Answer Any THREE Questions

16. State Uncertainty principle. Give the proof of uncertainty principle for one dimensional wave packet.
17. Explain the ground state condition of Hydrogen in terms of spherical polar co-ordinates.
18. Find the characteristic equation of the matrix. Verify CaleyHamilton theorem and hence find inverse of A
for $A=\left[\begin{array}{ccc}3 & 1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3\end{array}\right]$
19. (i) State and prove Gauss Divergence theorem.
(ii) State and prove Stoke's theorem.
20. Give the general solution of Bessel's differential equation.

## ISLAMIAH COLLEGE (AUTONOMOUS) VANIYAMBADI

## CIA-II

March 2020

Time: 3
Hours
Class: III B.Sc

## Subject Name: TELEVISION MAINTENANCE AND TROUBLESHOOTING

SECTION A-(10 $\mathbf{x} \mathbf{2}=\mathbf{2 0}$ marks)<br>Answer ALL Questions<br>All Questions Carry Equal Marks

1. Distinguish between fixed and variable capacitors.
2. What are the types of resistors used in electronic circuits?
3. How IF frequency is generated from mixer circuit?
4. State the principle of SMPS.
5. What is inductor?
6. Write notes on printed circuit board.
7. What is meant by composite video signal?
8. Briefly discuss the role of sense amplifier in SMPS power supply?
9. What is the function of antenna?
10. Why time base circuit is necessary in CRO?

## SECTION B-(5 x 5 = 25 marks) <br> Answer ALL Questions <br> All Questions Carry Equal Marks

11.(a) How can you identify the components used in TV circuits?
(Or)
(b) What is resonance antenna and explain their characteristics.
12. (a) Explain the repairing procedure for SMPS power supply circuit used in TV.
(Or)
(b) Explain vertical and horizontal scanning process.
13. (a) Explain the function of RF tuner in TV circuit.
(Or)
(b) Draw the circuit for picture tube circuit and associated controls and explain.
14. (a) With neat circuit explain the working of low voltage power supply.
(Or)
(b) Discuss the merits and demerits of SMPS power supply.
15. (a) Explain how video pattern generator is used to rectify various faults in TV
(Or)
(b) Discuss various blocks of VHF tuner. What is Balun transformer?

# SECTION C - (3 x $10=30$ marks) <br> Answer Any THREE Questions <br> All Questions Carry Equal Marks 

16. Explain the principle and working of cathode ray oscilloscope.
17. With neat block diagram explain the working of SMPS power supply.
18. Draw the block diagram for TV receiver and explain about the functioning of any three blocks.
19. Explain the construction details of Colour picture tube and discuss the procedure for adjustment of colour picture tube
20. Explain the construction details of Yagi antenna for channel 4. Discuss the role of various elements present in the antenna.
