(FOR THE CANDIDATES ADMITTED   SUBJECT CODE **21UMS 4A4 / 21UCY4A4**

DURING THE ACADEMIC YEAR 20 21-24 ONLY)   REG.NO. [ ]

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI
END-OF-SEMESTER EXAMINATIONS : MAY – 2023

B.Sc. Mathematics / Chemistry   **MAXIMUM MARKS: 70**

IV SEMESTER   **TIME : 3 HOURS**

PART - III
PHYSICS FOR MATHEMATICS AND CHEMISTRY – II
SECTION - A   (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.
MULTIPLE CHOICE QUESTIONS.   **(K1)**

1. Total work done to charge a capacitor to a charge q is _____.

    a) $q^{'}/c$ b) q^2/c c) q/c d) $½ q^2/c$

2. In Newton's ring experiment condition for getting darkness _____.

    a) $2t = n \lambda$ b) $2t=(n+1)\lambda/2$ c) $2t=2(n+1)\lambda/2$ d) $2t=2n \lambda$

3. In a regulated power supply to obtain a exact value of voltage as output, the device connected Is _____.

    a)   diode   b)   capacitor   c)   resistor   d)   Zener diode

4. The binary equivalent of the octal number 11 is _____.

    a)   1000   b)   1001   c)   1111   d)   10110

5. Which one of the following is Universal gate?

    a)   X-OR   b)   NOT   c)   NOR   d)   XNOR

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES.   **(K2)**

6. State Biot-s**a**vart law.

7. What is known as a grating element?

8. What is a transistor?

9. ASCII is acronym of what?

10. Write the statements of De Morgan's theorems.

ETHICAL PAPER

SECTION – B   **(5 X 4 = 20 MARKS)**

ANSWER EITHER (a) OR (b) IN EACH OF THE
FOLLOWING QUESTIONS.   (K3)

11. a) Describe a method of calibrating an ammeter using a potentiometer with a circuit diagram

(OR)

b) State and prove Krichoff's law

12. a) What are Newton's Rings? Give the theory of Newton's ring for getting the conditions for bright and dark fringes.

(OR)

b) What is known as polarization? Explain the terms plane polarized light and plane of polarization.

13. a) Differentiate intrinsic and extrinsic semiconductors.

(OR)

b) How will you construct a regulated power supply? Explain with a circuit diagram.

14. a) What are the steps to be followed to convert a binary number into a decimal number? Explain with at least two examples.

(OR)

b) Write a note on excess 3 code with two examples..

15. a) Construct an AND gate using discrete components and explain its function.

(OR)

b) Prove the following Boolean identity
$A + \bar{A}B = A + B$

SECTION – C   **(4 X 10 = 40 MARKS)**

ANSWER ANY FOUR OUT OF SIX QUESTIONS.
(16th QUESTION IS COMPULSORY AND ANSWER
ANY THREE QUESTIONS   (K4 (Or) K5)

16. Describe the method of Young's double slit experiment to explain the formation interference fringes and obtain the condition for getting dark and bright fringes with fringe width,

17. Deduce the expression for the potential at a point due to a uniformly charged conducting sphere.

18. What is grating? How do we obtain wavelengths of white light spectrum experimentally?

19. Draw the circuit diagram for the common emitter configuration of a transistor and describe its working with input and output characteristic curves.

20. a) Multiply the following binary numbers and verify with their decimal equivalent

i) 1100 X 101 (3marks)   ii) 1110 X 111 (3marks)

b) What are the binary equivalents of the following hexadecimal numbers?

i) 9F (2marks)   ii) 37 (2marks)

21. Draw the circuit diagram for Half and full adder and explain its working.

****