



JAIN COLLEGE, v v puram
For Reduced Syllabus

Test / Exam:	Mock -1	Month & Year:	2020-2021
Class:	II PUC	Subject:	Physics
Duration:	3:15 hrs	Max. Marks:	70

PART-A

I Answer ALL the following questions

10 x 1 = 10

1. How many electrons constitute $1\mu\text{C}$ of charge?
2. What is the workdone in bringing 2nC charge from one point to another on an equipotential surface?
3. Write the balanced condition of Wheatstone network.
4. Mention the SI unit of magnetic dipole moment.
5. Which kind of electromagnetic radiations are used in LASIK eye surgery?
6. Define power of a lens.
7. Write the expression for the de Broglie wavelength of a charged particle in terms of accelerating potential.
8. What is impact parameter?
9. Define atomic mass unit.
10. Write the circuit symbol of AND gate.

PART-B

II Answer any FIVE of the following questions

5 x 2 = 10

11. Define electric dipole moment. Mention its SI unit.
12. Write the expression for electric field on the axis of electric dipole in vector form and explain the terms.
13. When is the electric potential due to electric dipole (i) maximum and (ii) minimum?
14. A silver wire has a resistance of 2Ω at 30°C and a resistance of 2.5Ω at 100°C . Find the temperature co-efficient of resistivity of silver.
15. A 10C charge is projected in a region of crossed fields, having electric field of strength $4 \times 10^2 \text{ NC}^{-1}$ and magnetic field of strength 0.2T . Find the velocity of charged particle which moves undeflected in this region.
16. What is Lorentz force? Write the expression for Lorentz force in vector form.
17. Write the conditions for constructive interference.
18. Mention any two applications of photodiode.

PART-C

III Answer any FIVE of the following questions

5 x 3 = 15

19. Arrive at expression for potential energy of system of two point charges in the absence of external electric field.
20. Deduce Ohm's law and arrive at its vector form $\mathbf{j} = \sigma \mathbf{E}$ where the symbols have their usual meaning.
21. Define resistivity of the material. Name the factors on which resistivity of a material depends.
22. Derive an expression for the magnetic force acting on a conductor placed in uniform magnetic field.
23. Mention any three properties of magnetic field lines.
24. Arrive at the expression for motional emf.
25. Define the terms (i) impedance, (ii) bandwidth and (iii) quality factor.

26. Write any three properties of atomic nucleus.

PART-D

IV Answer any TWO of the following questions **2 x 5 = 10**

27. Derive an expression for the electric potential due to a point charge.
28. Arrive at the expression for equivalent emf and equivalent internal resistance of two cells connected in parallel.
29. What is self inductance of a coil? Derive an expression for energy stored in a coil.

V. Answer any TWO of the following questions **2 x 5 = 10**

30. Derive an expression for fringe width.
31. Explain the experimental observations on photoelectric effect.
32. Distinguish between conductors, semiconductors and insulators using band theory of solids.

VI. Answer any THREE of the following questions **3 x 5 = 15**

33. When two capacitors are connected in series and across a 4kV line, the energy stored in the system is 8 J. When the same two capacitors are connected in parallel across the same line, the energy stored is 36 J. Find the individual capacitance of the capacitors.
34. A circular coil of radius 10 cm consisting of 50 turns carries a current of 2A. Find the resultant magnetic field (i) at the centre of coil and
(ii) at a point on the axis at a distance 5cm from the centre.
35. A series LCR circuit contains a pure inductor of inductance 5H, a capacitor of capacitance $20\mu\text{F}$ and a resistor of resistance 40Ω . Find the (i) resonant frequency of the circuit
(ii) quality factor of the circuit and
(iii) impedance at resonance
36. A point source is located at the bottom of a tank filled with water to a depth of 20 cm. Find the area of circle through which light emerges out of water.
Given refractive index of water, $n = 1.33$.
37. Find the shortest and longest wavelength of Balmer series.
Given: Rydberg constant, $R=1.097 \times 10^7\text{m}^{-1}$.
