



JAIN COLLEGE, v v puram

For Reduced Syllabus

Test / Exam:	Mock -2	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. Write the expression for electric field in terms of volume charge density.
2. The distance between the plates of parallel plate capacitor is doubled. What is the new capacitance?
3. How does the resistance of a conductor vary with its length?
4. Two long straight parallel conductors carry current in the same direction. What is the nature of force between them?
5. Mention any one application of gamma ray.
6. Write the SI unit of power of lens.
7. Name one type of electron emission.
8. What are matter waves?
9. What is the ratio of nuclear densities of two nuclei having mass numbers in the ratio 1:3?
10. Write the truth table of NOR gate.

PART-B

II Answer any FIVE of the following questions

5 x 2 = 10

11. Mention any two properties of electric field lines.
12. Define electric flux. Mention its SI unit.
13. Write the expression for potential energy of system of three charges and explain the terms.
14. Define current density. Mention its SI unit.
15. When is the magnetic force acting on a charged particle moving in magnetic field
(i) maximum and (ii) minimum?
16. A current of 2π ampere is flowing through a straight conductor. Find the magnetic field produced by the conductor at a distance 4π metre from it.
17. Write any two conditions for sustained interference of light.
18. Mention any two applications of LED.

PART-C

III Answer any FIVE of the following questions

5 x 3 = 15

19. Derive an expression for capacitance of a parallel plate capacitor.
20. Arrive at an expression for current in terms of drift velocity.
21. What is the principle of metre bridge? Mention any two applications of it.
22. A galvanometer of resistance 12Ω gives full scale deflection for a current of 4mA. How do you convert it into a voltmeter of range 0-24V.
23. Find the value of dip at a place if the vertical component of earth's magnetic field is $\sqrt{3}$ times the horizontal component.
24. Explain Faraday's coil-coil experiment in the case of electromagnetic induction.
25. Derive an expression for instantaneous current in the case of ac source applied to a pure capacitor.
26. Find the energy equivalent of one atomic mass unit.

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

27. State Gauss law and hence derive an expression for electric field at a point due to uniformly charged infinite plane sheet.
28. Derive an expression for magnetic moment of revolving electron.
29. What is electrical resonance? Draw the variation of amplitude of current with frequency in series LCR circuit. Arrive at the expression for resonant frequency.

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

30. Deduce the relation between n , u , v and R for refraction at a spherical surface, where the symbols have their usual meaning.
31. Using Bohr's postulate, derive an expression for wave number of a spectral line in a hydrogen atom.
32. With suitable block diagram, explain the action of p-n junction diode under forward and reverse biased conditions. Also draw I-V characteristics.

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

33. Three charges 10nC , 15nC and 20nC are placed at the corners A, B and C respectively of a square ABCD of side 0.2m . Find the workdone in bringing 5nC charge from D to centre of square.
34. A wire having length 2m , diameter 1mm and resistivity $1.963 \times 10^{-8}\Omega\text{m}$ is connected in series with a battery of emf 3V and internal resistance 1Ω . Calculate the resistance of the wire and current in the circuit.
35. A circular coil of radius 10cm and 25 turns is rotated about its vertical diameter with an angular speed of 40 rads^{-1} , in a uniform horizontal magnetic field of $5 \times 10^{-2}\text{ T}$. Calculate the maximum emf induced in coil and also the maximum current in the coil if the resistance of coil is 15Ω .
36. A beam of light consisting of two wavelengths 600 nm and 500 nm is used to obtain interference fringes in Young's double-slit experiment. The distance between the slits is 0.2 mm and the distance between the screen and the slits is 2m . Find the least distance of the point from the central maximum, where the bright fringes due to both wavelengths coincide.
37. Ultraviolet light of wavelength 700 nm and 800 nm are made to fall on hydrogen atoms in their ground state one after the other. Electrons with kinetic energy 4eV and 1.8 eV respectively are emitted. Calculate the value of Planck's constant.
