JAIN COLLEGE

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Bangalore - 560 098

Date: ***SUBJECT: PHYSICS***

II PUC

Mock-I

Timings Allowed: 3Hrs 15 Minutes. ***Total Marks: 70***

General instructions:

1) All parts are compulsory.
2) Answers without relevant diagram/figure/circuit wherever necessary will not carry any marks.
3) Direct answers to Numerical problems without detailed solutions will not carry any marks.

PART-A

I. Answer the following. **10 X 1 = 10**

1. Mention one use of Van-de-Graff's generator.
2. On what principle is Kirchhoff's junction rule is based?
3. State Ampere's circuital law.
4. What is the resistance of an ideal voltmeter?
5. What are eddy currents?
6. Mention the expression for displacement current.
7. How can the resolving power of a telescope be increased?
8. What is the conclusion of Davisson- Germer experiment?
9. In which type of β-decay neutrino is emitted?
10. What is transducer in communication system?

PART-B

II. Answer any FIVE of the following questions: **5 X 2 = 10**

11. What is electrostatic shielding? Mention one use of it.
12. Mention any two limitations of ohm's law.
13. Write the expression for the magnetic force on a charge particle moving with velocity v in magnetic field. When it is maximum?
14. Write any two properties of magnetic field lines.
15. State Farady's laws of electromagnetic induction.
16. Define (i) impact parameter (ii) distance of closest approach.
17. Write the circuit symbol and truth table of OR gate .
18. Draw the block diagram of AM receiver.

PART-C

III. Answer any FIVE of the following questions: **5 X 3 = 15**

19. State and explain Coulomb's law of electrostatics. Write its vector form.
20. Obtain the expression for angular frequency of charged particle moving in uniform magnetic field.
21. Explain briefly the coil and magnet experiment to demonstrate electromagnetic induction.
22. What is a transformer? Mention its principle and write the expression for turns ratio.
23. (i) State Raleigh's scattering law. (ii) what type of lenses will be used to correct myopia and hypermetropia
24. What are Polaroids? Mention two uses of it.
25. State the postulates of Bohr's theory.
26. Write any three differences between p type and n type semiconductors.

PART-D

IV. Answer any TWO of the following questions: 2 X 5 = 10

27. Derive an expression for electric field at a point on axial line of an electric dipole.
28. Define relaxation time. Derive an expression for electrical conductivity of a material in terms of relaxation time.
29. Distinguish between dia, para and ferromagnetic substances.

V. Answer any Two of the following questions: 2 x 5 = 10

30. Give the theory of interference and arrive at the condition for constructive interference.
31. State the law of radioactivity and hence show that $N=N_0e^{-\lambda t}$.
32. With a neat circuit diagram explain the working of a diode as a full wave rectifier. Indicate the input and output wave forms.

VI. Answer any THREE of the following questions: 3 X 5 = 15

33. A point charge of 20μc is situated at a point O. A and B are 0.05m and 0.015 m away from this charge. Calculate the amount of work done to move an electron from B to A.

34. Two identical cells either in series or in parallel combinations, give the same current of 0.5A through external resistance of 4 Ω. Find the emf and internal resistance of each cell.

35. An inductor of 200mH, a capacitor 30μF and a resistor 100Ω are connected in series with an AC source 220- 50Hz. Calculate the inductive reactance and resonating frequency. Also find the current.

36. A biconvex lens of refractive index 1.5 has a focal length 0.1m. Calculate the radius of curvature. Find the position and nature of the image of an object held at a distance of 10cm from the lens

37. Calculate the change in stopping potential for photoelectrons emitted from a surface if the wave length of the incident light is reduced from $5900A^0$ to $5000A^0$.

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