II PUC Mock Paper -II JAN 2020
Subject: Physics (33)

Duration: 3.15 minutes **Max.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 marks.**

Part A

I. Answer all the following questions. **10x1=10**

1. Define relative permittivity of a medium in terms of force between electric charges?
2. What is an equipotential surface
3. Define the term relaxation time.
4. Write the significance of hysteresis loop.
5. On what principle AC generator works?
6. Write the relation between peak value and rms value principle.
7. Two lenses of power +1.5D and -0.5D are kept in contact on their principal axis .What is the effective power of the combination?
8. Give the formula for resolving power of a microscope.
9. How many neutrons are present in the nucleus of $_{141}Ba^{156}$
10. What is depletion region?

Part B

II. Answer <u>any five</u> of the following questions. **5x2=10**

11. Define electric dipole moment. Write its SI unit.
12. N identical resistors each of resistance R are connected in (i) series (ii) parallel. What is the effective resistance in each case.
13. What ate the functions of electric field and magnetic field in a cyclotron.
14. Write the expression for parallel plate capacitor with dielectric and explain the terms.
15. Mention the expression for mutual inductance of two long coaxial solenoids and explain the terms used.
16. Draw the intensity distribution curve of diffraction of light due to a single slit.
17. Mention the significance of binding energy curve.
18. Write the truth table for logic AND gate.

Part C

III. Answer <u>any five</u> of the following questions. **5x3=15**

19. Obtain an expression for the potential energy of a system of two charges in the presence of an external electric field.
20. Define electrical resistivity of a conductor. Mention two factors on which the resistivity of a conductor depend.

21. Derive an expression for magnetic field due to infinite long current carrying wire using ampere circuit law.
22. Write three distinguishing properties of a diamagnetic and paramagnetic substances.
23. Describe coil and coil experiment to demonstrate electromagnetic induction.
24. What is the principle of optical fiber? Write any two uses.
25. Define the terms (i) work function (ii) threshold frequency (iii) stopping potential.
26. Explain the working of pn junction in reverse bias.

Part D

IV. Answer <u>any two</u> of the following questions. 2x5=10

27. Derive the expression for electric potential due to an isolated point charge.
28. Obtain an expression for equivalent emf and equivalent internal resistance when two different cells are connected in parallel.
29. Using Biot-savart's law, derive the expression for magnetic field at a point on the axis of circular current loop.

Part E

V. Answer <u>any two</u> of the following questions. 2x5=10

30. Obtain an expression for the fringe width of interference fringes in the young's double slit experiment.
31. Assuming the expression for radius, derive the expression for the total energy of an electron in n^{th} orbit of hydrogen atom.
32. Distinguish between p-type and n-type semiconductor.

VI. Answer <u>any three</u> of the following questions. 3x5=15

33. ABC is an equilateral triangle of side 0.1m. Point charge of +9mc and -9mc are placed at corner A and B respectively. Calculate the resultant electric intensity at C.
34. A cell of emf 6V and internal resistance 0.5Ω is joined in parallel With another cell of emf 10V and internal resistance 1. The combination sends a current through an internal resistance of 12 . Find the potential difference across the 12 resistance.
35. The magnetic field due to a ccurrent carrying circular loop of radius 3cm at a point on the axis at a distance of 4cm from centre is 54T. What will be its value at the centre of the loop.
36. A double convex lens made of glass of refractive index 1.56 has both radii of curvature of magnitude 20cm. If an object is placed at a distance of 10cm from this lens. Find the position of image formed.
37. The work function of cesium metal is 2.14eV. When light of frequency 6×1014 Hz incident on the metal surface. What is (a) maximum kinetic energy of the emitted electron (b) stopping potential (c) maximum speed of the emitted photoelectrons.

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