BOARD OF INTERMEDIATE EDUCATION :: ANDHRA PRADESH
MODEL QUESTION PAPER
PHYSICS PAPER –II (W.e.f IPE - 2027)

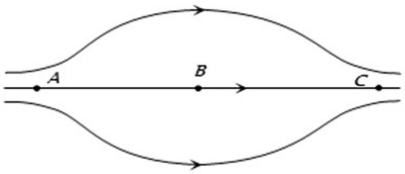
TIME: 3HOURS **MAX. MARKS : 85**

SECTION -A

(I). Answer all the following questions.

Each question carries ONE Mark. **9 X 1 = 9 Marks**

1. The figure shows some of the electric field lines corresponding to an electric field. The figure suggests



1) $E_A > E_B > E_C$ 2) $E_A = E_B = E_C$ 3) $E_A = E_C > E_B$ 4) $E_A = E_C < E_B$

2. The universal character of every material is
1) Diamagnetic 2) Paramagnetic 3) Ferromagnetic 4) Ferrimagnetic

3. If the flux linkage in a coil changes from 2 Wb-turns to 8 Wb-turns in 0.5 s, the average EMF induced is:
1) 10 V 2) 12 V 3) 6 V 4) 4 V

4. In an open circuit, the potential difference between the ends of a battery is equal to its _____.

5. What is the time period of AC mains in India ?
6. _____ charges radiate electromagnetic waves.

7. Which principle is used to find the position of a wave front after some time ?
8. The process of raising or transferring the electron from lower energy state to higher energy state is called _____.
9. The gap between the top of the valence band and bottom of the conduction band is called the _____ .

SECTION -B

II. Answer all the following questions.

Each question carries Two Marks. **14 X 2 = 28 Marks**

10. The electric lines of force do not intersect. Why?
11. In a hydrogen atom, the electron and proton are at a distance of 1 Å. Find the dipole moment of the system.

12. Write the vector form of Ohm's law. Explain the terms in it.
13. Write the formula for the magnetic field due to infinite straight wire and explain the terms in it.
14. Define magnetic susceptibility and relative permeability.
15. State Faraday's law of electromagnetic induction.

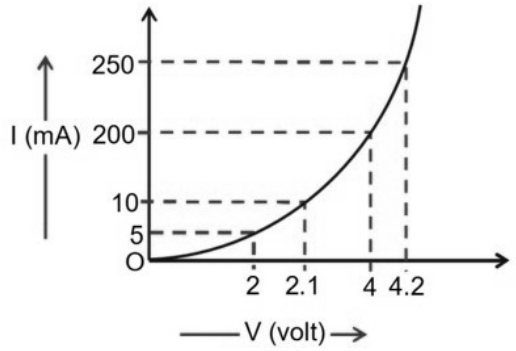
16. A capacitor has a capacitance of $\frac{1}{\pi}\ \mu F$, find its reactance for a frequency of 50 Hz
17. Give two uses of infrared rays.
18. What is the critical angle? Give one application of total internal reflection.
19. State Malus' law. Write the expression of malus' law.
20. Write down Einstein's photoelectric equation. Explain the terms in it?
21. Define impact parameter.
22. What are isotopes and isobars?
23. How is a battery connected to a junction diode in (1) forward and (2) reverse bias ?

SECTION -C

II. Answer any Eight of the following questions.

Each question carries Four Marks. 8 X 4 = 32 Marks

24. Derive an expression for the intensity of electric field at a point on the axial line of a dipole.
25. Derive an expression for the capacitance of a parallel plate capacitor.
26. Three capacitors of capacitances 2pF, 3pF and 4pF are connected in parallel
    (a) What is the total capacitance of the combination?
    (b) Determine the charge on each capacitor if the combination is connected to a 100V supply.
27. Using Kirchhoff's rules deduce the condition for balance in a Wheatstone bridge.
28. Explain the properties of paramagnetic materials.
29. Explain briefly working of AC generator.
30. State the principle on which a transformer works. Describe the working of transformer with necessary theory.
31. Does the principle of conservation of energy hold for interference and diffraction phenomenon? Explain briefly.
32. What are different types of physical processes to obtain free electrons from the metal surface.
33. What is the kinetic energy of an electron whose de-Broglie wavelength is 5000 A^0 ?
34. State Bohr's postulates of hydrogen atom
35. The I-V Characteristics of a P-N junction diode in forward bias are shown in the following figure. Find the ratio of dynamic resistance corresponding to forward bias voltages of 2V and 4V?



SECTION -D

II. Answer any two of the following questions.

Each question carries Eight Marks. **2 X 8 = 16 Marks**

36. (a) Derive an expression for the force acting between two very long parallel current carrying conductors with a neat diagram and hence define the ampere.

    (b). A current of 5A flows through each of two parallel long wires, the wires are 2.5 cm apart. Calculate the force acting per unit length of each wire.

37. Derive the equation for angle of deviation produced by a triangular prism with a neat labelled diagram, and there by derive an expression for refractive index of material of the prism.

38. (a) Explain Nuclear fission and fusion with suitable nuclear reactions.

    (b) 200 MeV energy is released when one nucleus of $_{92}U^{235}$ undergoes fission. Find the number of fissions per second required for producing a power of 1megawatt.