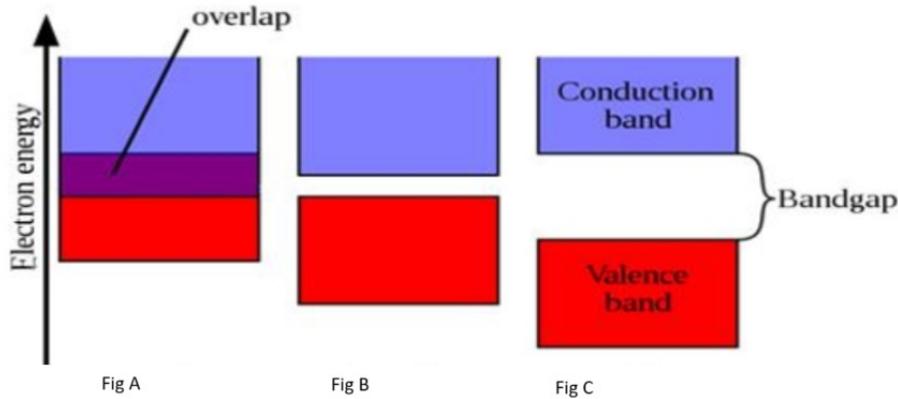


17. Identify the different types of solids from the figure given.

2 K1 CO4



18. Solve for the wavelength emitted by a light source constructed using a GaAs semiconducting material whose band gap is 1.54eV 2 K2 CO4
19. If a transistor has $\alpha = 0.97$, find the value of β . 2 K2 CO5
20. List the three regions of operation of a BJT. 2 K1 CO5
21. Sketch the VI characteristics of a SCR. 2 K2 CO6
22. Explain the principle of solar cell. 2 K2 CO6

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23. a) Based on the assumptions of classical free electron theory, obtain an expression for the electrical conductivity of a metal. 11 K2 CO1
- OR**
- b) Derive an expression for the density of state based on the quantum theory. 11 K2 CO1
24. a) Based on various magnetic phenomena, compare and contrast different types of magnetic materials. 11 K2 CO2
- OR**
- b) Discuss the domain structure in ferromagnetic materials and show how the hysteresis curve is explained on the basis of domain theory. 11 K2 CO2
25. a) Derive an expression for internal field in dielectrics. 11 K2 CO3
- OR**
- b) Explain in detail the various dielectric breakdown mechanisms. 11 K2 CO3
26. a) Construct a PN junction diode in forward and reverse bias enabling unidirectional current flow with appropriate characteristic curves. 11 K2 CO4
- OR**
- b) Derive an expression for the density of electron in conduction band in an Intrinsic semiconductor. 11 K2 CO4
27. a) Construct a circuit with NPN transistor in the common emitter configuration and explain its working using input and output characteristics. 11 K2 CO5
- OR**
- b) Using the Ebers-Moll model, analyze the behavior of NPN transistor circuit under forward and reverse active modes. Also give the equations for emitter, base and collector currents. 11 K2 CO5
28. a) With neat diagrams, discuss the construction of JFET and elaborate its drain characteristics. 11 K2 CO6
- OR**
- b) Explain the construction and working of Liquid Crystal display. 11 K2 CO6