

Question Bank

Unit 4

Semi Conducting & Ceramic materials (CO-4)

1	Give a brief account of band theory of solids with necessary diagrams? (or) Explain electrical conductivity of conductors, semiconductors and insulators based on band theory? (or) Explain salient features of band theory of solids?
2.	Explain p-type and n-type semiconductors with neat diagrams (or) Write about role of doping on band structure of semiconductors?
3.	What are Organic semi conductors? Explain the mechanism of conduction process in organic semi conductors?
4.	What are Organic Semiconductors? How are they classified? Write their uses?
5.	Explain the manufacturing process of Portland cement with neat sketch?
6.	Explain the chemical reactions involved in setting and hardening of cement?
7.	Mention the role of Gypsum in Cement?
8.	What are refractory materials? Explain their classification?
9.	What are ceramic materials? Give their engineering applications?

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For advanced learners

1	Based on band theory explain the electrical conduction in lithium and magnesium metals?
2.	Explain how the solids are classified based on band theory?
3.	What happens to the conductivity of conductor with increase of temperature?
4.	Explain why the conductivity of a conductor decreases with increase of temperature?
5.	How dopants applied reduce band gap in semiconductors? Explain?
6.	Doping germanium with phosphorous produces n-type semiconductor. Explain?
7.	Doping Silicon with aluminium produces p-type semiconductor. Explain?
8.	What are polarons and bipolarons? Give their applications?
9.	What is meant by doping? Explain the role of P-type and n-type dopants on band structures?
10.	Exemplify the mechanism of conduction in various types of conducting polymers?
11.	What are organic semi conductors? How conductivity of Organic semiconductors can be improved?
12.	Mention the steps involved and explain the reactions during burning process of cement manufacture with neat sketch?
13.	Draw labeled diagram of rotary kiln required for the manufacture of Portland cement and mention the reactions in each zone?
14.	Why gypsum is added during manufacture of portland cement? Explain with equation?
15.	What are refractory materials? Explain their classification with one example to each type?