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Total Number of Pages : 2

AR-17

B.TECH

B.TECH 5th SEMESTER EXAMINATIONS, NOV/DEC 2019**BMEOE5053 MATERIAL SCIENCE**

Chemical Engineering

Time : 3 Hours

Maximum : 100 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) 10 x 2=20 MarkQ.1. Answer All Questions

- a Covalent bonding is found in ----- . [CO1] [PO1]
 (a) Diamond (b) NaCl (c) Iron (d) Argon
- b ----- has HCP crystal structure. [CO1] [PO1]
 (a) Aluminium (b) Iron (c) Titanium (d) Copper
- c Supercooling is observed in ----- . [CO1] [PO2]
 (a) Grey Cast Iron (b) Pure Metals (c) Eutectic alloys (d) All the above.
- d Brass is a solid solution of copper and ----- . [CO2] [PO1]
 (a) Nickel (b) Zinc (c) Chromium (d) Aluminium
- e ----- is not a solid solution alloy [CO2] [PO1]
 (a) Cu-Zn alloy (b) Au-Ag alloy (c) Ni-Cu alloy (d) Mg-Sn alloy
- f ----- is non magnetic and soft. [CO3] [PO1]
 (a) Ferrite (b) Cementite (c) Austenite (d) Bainite.
- g In heat treatment the quenching is done in ----- medium. [CO3] [PO2]
 (a) water (b) oil (c) air (d) All the above
- h ----- is optical property required in mirrors [CO4] [PO1]
 (a) Refractive index (b) Absorptivity (c) Reflectivity (d) Absorption co-efficient
- i ----- is ceramic materials [CO4] [PO1]
 (a) Brick (b) Refractories (c) Abrasives (d) All the above.
- j ----- is a natural fiber. [CO4] [PO1]
 (a) Nylon (b) Hemp (c) Rayon (d) glass fiber.

PART – B: (Short Answer Questions) 10X2=20 Marks**Q.2. Answer All questions**

- a State the properties of metals. [CO1] [PO1]
- b What do you mean by crystal imperfection? [CO1] [PO1]
- c Give the crystal structure of HCP. [CO1] [PO1]
- d Define polymorphism. [CO2] [PO1]
- e State Lever rule [CO2] [PO2]
- f Write a note on microstructure of pearlite. [CO3] [PO1]
- g Define hardenability. [CO3] [PO1]
- h Give the application of HSS. [CO3] [PO1]
- i What do you mean by plastic deformation? [CO4] [PO2]
- j Explain the role of fibers used in composites. [CO4] [PO2]

PART – C: (Long Answer Questions) 4X15=60 Marks**Answer All questions**

Q.3

- a Describe the Miller Indices. 8 [CO1] [PO1]
- b Explain the defects in crystals. 7 [CO1] [PO2]

OR



- c Describe the methods used to determine crystal structure. 8 [CO1] [PO1]
d Explain the process of solidification of metals. 7 [CO1] [PO2]

Q.4

- a Narrate the factors governing solubility of solids. 8 [CO2] [PO1]
b Explain with neat sketch a binary phase diagram. 7 [CO2] [PO2]

OR

- c Discuss the microstructure of alloys belonging to Eutectic system. 8 [CO2] [PO1]
d Construct an iron carbon diagram and explain in detail. 7 [CO2] [PO2]

Q.5

- a Explain in detail the heat treatment of steel. 8 [CO3] [PO2]
b Discuss the Jominy end quench test with a neat sketch. 7 [CO3] [PO1]

OR

- c Discuss the applications of alloy steels. 8 [CO3] [PO1]
d Explain the types of cast irons in detail. 7 [CO3] [PO1]

Q.6

- a Discuss the applications of ceramics. 8 [CO4] [PO1]
b Differentiate between thermosetting and thermo plastics. 7 [CO4] [PO1]

OR

- c Discuss the types of composites and their applications. 8 [CO4] [PO1]
d Explain the applications of Nano materials. 7 [CO4] [PO1]

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