

Code No: 135CG

R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, May/June - 2019

FUNDAMENTALS OF ENGINEERING MATERIALS

(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Describe the procedure to find out miller indices for a given coordinates. [2]
- b) Calculate the packing efficiency of FCC structure. [3]
- c) Define phase. [2]
- d) What are the limitations of phase diagrams? [3]
- e) Differentiate between hardness and hardenability. [2]
- f) Write the differences between annealing and normalizing processes. [3]
- g) Define cast irons. [2]
- h) Write few industrially important properties of copper. [3]
- i) Define glasses. [2]
- j) Write important properties of cermets. [3]

PART - B

(50 Marks)

2. Define the following terms:
 - a) Space lattice
 - b) Unit cell
 - c) Lattice parameters
 - d) Alloy.[10]

OR

- 3.a) Explain Hume-Rothery rules.
 - b) Discuss about intermetallic compounds and electron compounds. [5+5]
4. What are binary phase diagrams? With the help of a suitable example explain isomorphous system. [10]

OR

5. What do you mean by eutectic alloy? Explain the eutectic system with the help of an example. [10]

6. What is hardening? Explain various hardening methods with the help of suitable TTT diagram. [10]

OR

- 7.a) Discuss various types of tempering processes.
b) What are stainless steels? Explain any one type of stainless steel with its composition, properties and applications. [5+5]

8. List out various industrially important aluminum alloys. Write their composition, properties and applications. [10]

OR

9. With the help of neat diagrams explain the composition, properties and applications of White and malleable cast irons. [10]

10. Define composites. Explain how composites are classified based on reinforcement and based on matrix. Give suitable examples. [10]

OR

11. Define polymers. How polymers are classified? List out important properties and applications of polymers. [10]

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