

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – June 2024
Programme Name: B Tech (ME)
Semester: V
Subject Code: UG11T3501
Subject Name: MATERIAL SCIENCE

Date: 10.06.2024

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) Options, if any, are specified in respective section.

Section A

There are 10 questions in this section. All are compulsory. Each question carries 01 Mark. Fill in the blank or answer from options given below the question.

1. Elastomers are _____ which are less tightly bound together.
A. metals B. solid solutions C. polymers D. alloy
2. In alloy, at least one component is _____.
A. non-metal B. iron C. carbon D. metal
3. Graphical representation of changes in state of alloys due to variation in _____ & concentration is called Equilibrium Diagram.
A. pressure B. temperature C. volume D. weight
4. _____ is done to remove some of the brittleness and hardness of steel after hardening.
A. Annealing B. Normalising C. Tempering
5. In fatigue failure, material under cyclic loading fails below its ultimate tensile stress.
A. true B. false
6. _____ corrosion is the removal of one element from a solid alloy by corrosion process.
A. Selective B. Atmospheric C. Pitting D. Stress
7. Bronze is alloy of copper and _____.
A. zinc B. iron C. tin D. lead

8. _____ is added to steel to make it stainless steel.
 A. Chromium B. Carbon C. Copper D. Zinc
9. If carbon content in iron is 3%, the material will be called _____.
 A. cast steel B. carbon steel C. cast iron D. steel
10. PVC is a polymer.
 A. True B. False

Section B

There are 5 questions in this section. All are compulsory. Each question carries 02 Marks.

11. What is Solid Solution? Name its types.
12. What is fracture? Name types of fracture.
13. Write down factors influencing corrosion.
14. Which materials are used in construction of Propeller? Describe in brief.
15. What is plastic? Name its two main types.

Section C

There are 7 questions in this section, out of which any 5 are to be answered. Each question carries 10 Marks.

16. What do you mean by Space Lattice & Unit Cell? Describe with diagram and examples unit cell of most common type of three space lattices found in metals. (4+6)
17. Describe allotropy. Draw cooling curve of pure iron showing its various allotropic forms at different temperatures. (4+6)
18. What is heat treatment & why it is done on metals? Describe 'Hardening' heat treatment process? (5+5)
19. What do you understand by 'Creep'? Draw & explain a creep curve, showing various stages in creep phenomena? (4+6)
20. Explain 'corrosion'. Differentiate between dry & wet corrosion. List methods for control & prevention of corrosion. (2+4+4)
21. Describe Ferrous & Non-ferrous metals with examples. What is alloy steel & what are its uses? (4+6)
22. Write short note on any two of the following: (5+5)
 1. Ceramics
 2. Stellite alloy
 3. Paints