

Code No: R05220303

R05

Set No. 2

II B.Tech II Semester Examinations, April/May 2012
METALLURGY AND MATERIALS SCIENCE
Common to Mechanical Engineering, Mechatronics, Production
Engineering, Automobile Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What are ceramics? Name various types of ceramics.
(b) Explain the properties and engineering applications of glasses.
(c) What is meant by cermaets? Explain. [6+6+4]
2. (a) Explain about Alpha and Alpha-Beta Alloys of Titanium.
(b) Which Aluminium casting alloy develops the highest mechanical properties? Why?
(c) What is meant by anodizing of Aluminium? Explain. [6+5+5]
3. (a) Mention some of the applications of phase diagrams.
(b) Explain lever rule & composition rule.
(c) Distinguish between peritectic reaction and peritectoid reaction. [4+8+4]
4. Discuss the various types of cast irons with regard to their manufacture, composition, microstructure and appearance of fractures. [16]
5. What kind of bond do you expect in the following and explain the bond?
 - (a) C_6H_6
 - (b) Agcl
 - (c) O_2
 - (d) SO_2 . [4 × 4 = 16]
6. (a) Explain the effects of
 - i. Sub-zero treatment
 - ii. Addition of carbon
 - iii. quenching media on the hardness of steels.
(b) Explain the various stages in a heat treatment cycle. [9+7]
7. (a) What are the methods used for producing fiber-reinforced plastics? Explain them.
(b) Derive the equation of Rule of mixtures for continuous fiber composites [8+8]
8. (a) Describe the importance of Hume-Rothery rules in the development of alloys.

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- (b) How are the intermetallic compounds classified? Compare intermetallic compounds with the interstitial compounds. [8+8]

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(d) SO_2 .

[4 × 4 = 16]

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8. Discuss the various types of cast irons with regard to their manufacture, composition, microstructure and appearance of fractures. [16]

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(c) What is meant by anodizing of Aluminium? Explain.

[6+5+5]
