

**B.E DEGREE EXAMINATIONS: NOV/DEC 2014**

(Regulation 2009)

Fourth Semester

**MECHANICAL ENGINEERING**

MEC108:Engineering Materials and Metallurgy

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. Minor part of material in a solution, which dissolves is known as,
  - a) Solute
  - b) Solvent
  - c) Component
  - d) Phase
2. Which boundary line separates liquid and liquid + solid phase regions in a phase diagram?
  - a) Solvus line
  - b) Solidus line
  - c) Liquidus line
  - d) Eutectic line
3. How will you eliminate the internal residual stresses by using heat treatment process?
  - a) Process annealing
  - b) Commercial annealing
  - c) Spheroidizing
  - d) Normalizing
4. In which surface hardening process, alternate current is used to heat the workpiece
  - a) Cyaniding
  - b) Thermal hardening
  - c) Induction hardening
  - d) Nitriding
5. Choose any one high alloy steel
  - a) Tool and die steel
  - b) AISI steel
  - c) HSLA steel
  - d) Construction steel
6. Recall the name of alloy known as Babbitt metal
  - a) Copper base alloy
  - b) Tin base bearing alloys
  - c) Aluminium base bearing alloy
  - d) Ceramic bearing alloy
7. Name the polymer having Molecular weight ranging from 10,000 to 10,00,000 g/mol
  - a) Monomer
  - b) Oligo polymer
  - c) Low polymers
  - d) High polymers



b) Distinguish between hardness and hardenability. With suitable sketches, explain the Jominy hardness test for hardenability.

23. a) (i) With a neat sketch, explain precipitation hardening. (10)  
(ii) State the properties of bearing alloys. (4)

**(OR)**

- b) (i) Explain the effect of alloying elements in steel. (8)  
(ii) Discuss about the grey cast iron. (6)

24. a) What are the different types of polymers? Label any four polymers with their properties and applications.

**(OR)**

- b) Name the different types of engineering ceramics. Explain their properties and applications.

25. a) Explain the high velocity oxygen fuel spraying with a neat diagram.

**(OR)**

- b) Illustrate the working of electro less plating with suitable diagrams.

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