



202044

<b>Seat No.</b>	
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**S.E. (Mechanical/Automobile) (Semester – I) Examination, 2014**  
**MATERIAL SCIENCE**  
**(2012 Course)**

Time : 2 Hours

Max. Marks : 50

- Instructions :**
- 1) Solve Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6, Q. 7 or Q. 8.
  - 2) Figures to the **right** indicates **full marks**.
  - 3) Draw the neat sketch **whenever** necessary.

**1. Solve any three :**

- a) Differentiate between cold working and hot working. 4
- b) What is role of dislocation in the plastic deformation of metal. 4
- c) Explain how engineering materials are classified. Explain in brief thermoplastic and thermosetting polymers. 4
- d) Explain elastomers. 4

OR

**2. Solve any three :**

- a) What is recrystallization ? Explain the factors affecting recrystallization process. 4
- b) Explain the strain hardening with curve. 4
- c) Explain hybrid composites. 4
- d) Write short note on ceramic materials. 4

**3. a) What is endurance limit ? Explain fatigue fracture with suitable figure. Also state the applications where fatigue strength is necessary. 6**

- b) Write short notes on :
  - 1) Poldi hardness test
  - 2) Compression test.

OR

**4. a) Which type of test is carried out at high temperature of metal sample under test. Also explain the related curve obtained. (Draw suitable figure). 7**

- b) Write short notes on :
  - 1) Erichson cupping test
  - 2) Durometers. 6

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5. a) Explain the process of impregnation of self lubricating bearings. 4  
 b) Draw a flow chart for the production of cemented tools. 5  
 c) Explain the terms :  
     I) Flow rate  
     II) Apparent density.
- OR
6. a) Describe the steps involved in manufacturing of powder metallurgy component. 5  
 b) Explain the automation process of powder manufacturing with neat sketch. 4  
 c) Write a short note diamond impregnated cutting tools. 4
7. a) Classify different magnetic materials, and explain any one in detail. 6  
 b) Give classification of different biomaterials, and explain any one in detail with proper applications. 6
- OR
8. Write short notes on (**any three**) : 12
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- 1) Carbon nanotubes  
 2) Smart materials  
 3) Behaviour of metal at low temperature  
 4) Soft and hard magnetic materials.