Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

ES-220(AU/ME/MI)

B.E., III Semester

Examination, December 2016

Choice Based Credit System (CBCS)

Material Science

Time : Three Hours

Maximum Marks : 60

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Define the term atomic packing factor. Calculate its value for simple cube, body centered cube and face centered cube.
   b) What are Miller indices? How are they determined?

2. a) Differentiate between the edge dislocation and screw dislocation.
   b) What is cold working? How important properties like hardness and electrical resistance change typically for a metal when it is cold worked?

3. a) Describe briefly the substitution solid solution with the neat diagram.
   b) With the help of neat sketch explain the iron carbon diagram.

4. a) Explain briefly the martempering and austempering methods.
   b) Describe the critical rate of quenching. Also explain the different quenching media used for heat treatment.

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5. a) Explain the flow for production of iron and steel.
   b) What is powder metallurgy? Explain.

6. a) Explain with suitable diagram the TTT curve.
   b) Differentiate the hot and cold working processes.

7. a) What are special properties of plastic that make them useful for engineering materials?
   b) What is the effect of grain size on properties of materials?

8. Write short note on:
   a) Carbon nano tube
   b) Magnetic properties of materials
   c) Annealing

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