

Seat  
No.

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मठ - 031

## Engineering Metallurgy (1080)

P. Pages : 2

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory and Attempt **any two** bits out of a, b, c from each question.
5. Neat diagrams must be drawn wherever necessary.
6. Block figures to right indicate full marks.
7. Use of Electronic Non programmable calculator is allowed.
8. Assume suitable data if necessary giving proper justification.

### UNIT - I

1. a) Differentiate clearly between the following points. 10
  - i) Sulphur printing and phosphorous printing.
  - ii) Eutectic Transformation & Eutectoid Transformation.
- b) Draw Fe - Fe<sub>3</sub>C equilibrium diagram and label it in detail and explain the peritectic transformation in detail. 10
- c) Write short note on. 10
  - i) Non - equilibrium cooling.
  - ii) Widmanstatten structure.

### UNIT - II

2. a) Write short notes on. 10
  - i) Annealing process.
  - ii) Tempering.
- b) Draw Only TTT diagrams for following types of plain carbon steels. 10
  - i) Hypoeutectoid steel
  - ii) Eutectoid steel
  - iii) Hypereutectoid steel.
- c) Explain what do you mean by hardenability ? And explain in detail. Jominy End quench Test. 10

## UNIT - III

3. a) Write short notes on: 10  
 i) Continious furnace  
 ii) Pit furnace.
- b) Explain the processes of Turfftriding and sursulf surface treatment processes along with carbonitriding. 10
- c) i) Classify types of heat treatment furnaces and explain salt bath furnaces. 5  
 ii) Explain the process of Nitriding. 5

## UNIT - IV

4. a) Write short notes on. 10  
 i) Stainless steel.  
 ii) Grep cost Iron.
- b) List various alloying elements used in alloy steel and explain effect of any 04 elements on steel. 10
- c) Explain Tool steel ? What are general properties requirement of tool steels ? And explain oil Hardened and water hardened tool steel. 10

## UNIT - V

5. a) Write short notes on. 10  
 i) Porasses and Brontes.  
 ii) Dispersion type of composites.
- b) Give composition & uses for following alloys. 10  
 i) Invar  
 ii) Beryllium bronze  
 iii) Phosphor bronze  
 iv) LM II  
 v) Gunmetal.
- c) Write short notes on. 10  
 i) Metal matrix composite.  
 ii) Tin equivalent.

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