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CBI1326

**Engineering Metallurgy
(New) (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 questions.
5. Neat diagrams must be drawn wherever necessary.
6. Black figures to the right indicate full marks.
7. Use of electronic non-programmable pocket calculator is allowed.
8. Assume suitable additional data, if required, giving proper justification.

UNIT - I

1. a) Draw Fe – Fe₃C equilibrium diagram showing all temperatures, compositions & phases. Explain the solidification of slowly cooled steels 0.6%C & 1.0%C (Plain carbon steels) also draw their microstructures at room temperature. **10**
- b) Differentiate clearly between the following pairs: **10**
 - i) Metallurgical microscope & Biological microscope.
 - ii) Eutectoid transformation & Eutectic transformation.
- c) Write short notes on : **10**
 - i) Specimen preparation for optical microscopy.
 - ii) Macro Tests.

UNIT - II

2. a) List different transformation products of austenite & explain each one in detail. **10**
- b) Differentiate clearly between the following pairs : **10**
 - i) Pearlite & bainite.
 - ii) Martempering & Austempering.
- c) Write short notes on : **10**
 - i) Hardening.
 - ii) Tempering.

UNIT - III

3. a) Classify & list all types of heat treatment furnaces & explain construction, working, advantages & disadvantages of continuous furnace & salt bath furnace. 10
- b) Differentiate clearly between the following pairs : 10
 i) Carburising & Nitriding.
 ii) Induction hardening & Flame Hardening.
- c) Write short notes on : 10
 i) Heat treatments after carburising.
 ii) Muffle furnace.

UNIT - IV

4. a) Explain in detail, with examples, the effect caused by addition of alloying elements in steel. 10
- b) Distinguish clearly between the following pairs : 10
 i) Plain carbon steel & Alloy steel.
 ii) White C.I. & Gray C.I.
- c) Write short notes on : 10
 i) Heat treatment cycle of 18-4-1 high speed tool steel.
 ii) S.G.C.I.

UNIT - V

5. a) Give compositions, properties & uses of the following alloys : 10
 i) Muntz metal.
 ii) Monel.
 iii) German Silver.
 iv) Invar.
 v) Bell metal.
- b) Distinguish clearly between the following pairs : 10
 i) Brasses & Bronzes.
 ii) Fibre reinforced composites & laminated composites.
- c) Write short notes on : 10
 i) Babbitts.
 ii) Age hardening alloys.
