

[This question paper contains 3 printed pages.]

Your Roll No. ....

3185

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**MEM**

Paper—ME.507

**FOUNDRY TECHNOLOGY**

*Time : 3 Hours*

*Maximum Marks : 100*

*(Write your Roll No. on the top immediately  
on receipt of this question paper.)*

*Attempt any five questions.*

*All Questions carry equal marks.*

1. (a) What is a clay-dipole? Enumerate different types of clays along with genesis of each. Discuss the effect of heat on clay bonding. 10
- (b) Discuss the sodium silicate  $\text{CO}_2$  process. What are the effects of gassing time on Green Compressive strength of moulding sand? 10
2. (a) Why is it so important to use new or reclaimed sand as a facing for sands in steel foundry? What advantages reclaimed sand have over new sand from the stand-point of foundry operations? 10
- (b) Draw iron-carbon diagram (equilibrium) and discuss salient features of the diagram with reference to GCI. What effect does the presence of 2 percent silicon have on Fe-C (equilibrium diagram)? 10

3. (a) How would you increase the efficiency of an open riser? Discuss ideal theoretical shape of riser and its drawbacks. What factors limit the use of blind risers? 10
- (b) What is meant by Inoculation? How does it influence the structure and properties of G. Cast Iron? Discuss the castability of alloy steel with cast iron. 10
4. (a) Discuss the effects of following alloying elements on the metallurgy of G.C.I. :
- (i) Nickel, 10
- (ii) Chromium. 10
- (b) What is the modulus method of riser design? Discuss and show by sketches how solidification can be controlled by padding? What effect does padding have upon bottom gated castings? 10
5. (a) What is Flaskless Moulding? How can the use of vertically parted flaskless moulding reduce the number of mould sections required to produce a series of castings? 10
- (b) How does an alloy and a pure metal solidify in an ideal conditions? What is homogeneous and heterogeneous nucleation? Explain. 10

6. Discuss the following casting defects with causes and remedies :
- (i) Buckles and scabs,
  - (ii) Drops,
  - (iii) Hot tears,
  - (iv) Metal penetration. 20
7. Write short notes on the following :  $5 \times 4 = 20$
- (a) Malleabilizing cycle of ferritic malleable iron,
  - (b) Cain's rule of riser design,
  - (c) Low pressure die casting process,
  - (d) Cold box process of core making.