[Total No. of Questions - 8] [Total No. of P[illegible]ed Pages - 2]
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- 9 DEC 2016

M. Tech 1st Semester Examination

Metal Casting

PE-101

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt 5 questions. All questions carry equal marks.

1. (a) Explain the characteristics of moulding sands. What are ingredients of moulding sand and core sands? (10)

   (b) How testing of moulding sand is carried out, list equipments and the procedure. (10)

2. (a) Give the relevance of the following with reference to a casting using a neat sketch/s: pattern, core, chaplet. sprue, runner, ingate, chills. (10)

   (b) List the classification of moulding methods. (10)

3. (a) What are different types of allowances provided on the pattern and give a brief description along with appropriate example? (10)

   (b) Discuss complete procedure of gating system design; explain with suitable examples and equations. (10)

4. (a) Describe the moulding methods by indicating principle, types, merits, demerits and applications of shell moulding and precision moulding. (10)

   (b) Explain die casting process, types, material of die, applications and the process parameters that affect the process. (10)

5. (a) What is directional solidification, discuss its importance and how it is achieved? (10)

   (b) What is the role of rate of solidification in the nucleation and final structure obtained? (10)

6. (a) What is meant by mould constant and its significance in metal casting? (10)

   (b) Describe the difference in the solidification of pure metals and an alloy. Discuss the difference between homogeneous and heterogeneous nucleation. (10)

7. (a) Describe calculations for casting filling time with an appropriate example. (10)

   (b) What are the different suitable casting processes used for stainless steel, aluminium, and brass metals? Justify your answer. (10)

8. Write short notes on the following:

   (a) Factor that affects the fluidity of metals.

   (b) Casting defects. (20)