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Total number of printed pages – 2

B. Tech
PCMT 4305

Sixth Semester Regular Examination – 2014

SOLIDIFICATION AND CASTING

BRANCH(S) : MM, MME

QUESTION CODE : F 260

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory and any five from the rest.
The figures in the right-hand margin indicate marks.

1. Answer the following questions :

2×10

- (a) Explain how growth occurs in solidification process.
 - (b) Describe Chowrinov rule ?
 - (c) What is crystallization ?
 - (d) What is hot tear ? How can we eliminate it ?
 - (e) How does cellular growth occur ?
 - (f) What is Mis run ?
 - (g) How vacuum sealed casting process is advantageous than other forming processes ?
 - (h) What is progressive solidification ?
 - (i) Why cold shut occurs ?
 - (j) How centrifugal casting process is more beneficial than other casting processes ?
2. (a) Discuss different metallurgical defects in casting process, their causes and remedial measures. 5
- (b) What is the function of riser and give a classification of risers. Which type of riser is more advantageous and Why ? 5

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3. (a) Explain briefly planar growth and factors hindering planar growth. 5
(b) Describe investment casting process. Write its advantages, disadvantages and application. 5
4. What is gate ? What is the requirement and purpose of gating system in casting ? Explain different types of gating systems. 10
5. (a) Why does moulding material defect and pouring metal defect occur in casting and how can these be eliminated? 5
(b) What are the advantages of addition of alloying element over pure metals ? 5
6. (a) Explain the role of Ellingham diagram in melting of metals for casting purposes. 5
(b) Explain different types of segregation. 5
7. Differentiate between (any **two**): 5×2
(a) Homogeneous nucleation and Heterogeneous nucleation
(b) Open riser and Blind riser
(c) Cellular growth and Dendritic growth.
8. Write short notes on any **two** : 5×2
(a) Independent nucleation
(b) True centrifugal casting
(c) Casting yield.