

USN

17ME35A

**ThiriongesTer B.E. Degree Examination, June/July 2019**  
**Metal Casting and Welding**

**Time: 3 hrs.**

**Max. Marks: 100**

*Note: Answer any FIVE full questions, choosing  
ONE full question from each module.*

**Module-1**

- 1 a. Explain briefly the basic steps involved in sand casting process. (04 Marks)
- b. Define Pattern. List the pattern materials and explain any 2 pattern materials. (08 Marks)
- c. Discuss the characteristics of molding sand. (08 Marks)

**OR**

- 2 a. With a suitable sketch, explain the following terms:  
i) Sprue ii) Pouring basin iii) Runner iv) Ingates v) Riser. (10 Marks)
- b. With a neat diagram briefly explain investment casting. (10 Marks)

**Module-2**

- 3 a. Briefly explain hot chamber pressure die-casting with a neat sketch. (10 Marks)
- b. Draw coreless induction furnace and explain in brief state the advantages. (10 Marks)

**OR**

- 4 a. With a neat diagram, explain various zones in cupola furnace. Write the reactions taking places in each zone. (10 Marks)
- b. Draw and explain the following: i) Continuous casting ii) Centrifugal casting. (10 Marks)

**Module-3**

- 5 a. Define the following terms:  
i) Growth and Nucleation in solidification.  
ii) Homogeneous and Heterogeneous nucleation. (08 Marks)
- b. Briefly explain directional solidification and progressive solidification with neat sketch. (08 Marks)
- c. Define solidification. Explain the concept of solidification in casting. (04 Marks)

**OR**

- 6 a. Define degasification. Classify degasification process. Explain any 2 methods of degasification. (10 Marks)
- b. List the casting defects. Discuss various methods to reduce the defects. (10 Marks)

**Module-4**

- 7 a. With a neat sketch explain TIG welding and state advantages and disadvantages of TIG welding. (10 Marks)
- b. Describe Atomic Hydrogen Welding (AHW) briefly with a neat diagram. (10 Marks)

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OR

- 8 a. With a neat sketch describe thermit welding and state the advantages. (10 Marks)  
b. Explain briefly with a neat sketch Laser Beam welding. State the application. (10 Marks)

**Module-5**

- 9 a. Describe Heat Effected Zone (HAZ). Discuss the parameters affecting HAZ. (10 Marks)  
b. List welding defects. Explain any 5 defects with its cause and remedies. (10 Marks)

OR

- 10 a. With neat sketch explain magnetic particle inspection and florescent particle inspection. (10 Marks)  
b. Draw and explain different types of flames in oxy-acetylene welding process. (10 Marks)

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