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18ME45B/18MEB405

Fourth Semester B.E. Degree Examination, July/August 2022

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. What is casting? Draw the flow chart of casting process. (07 Marks)
- b. What is pattern? Briefly explain pattern allowances with neat sketches. (07 Marks)
- c. Briefly explain the properties of foundry sand. (06 Marks)

OR

- 2 a. Sketch and explain preparation of sand molds using squeeze molding machine. (06 Marks)
- b. With neat sketches briefly explain the steps involved in investment molding process. (08 Marks)
- c. What is coring and gating? List the types of cores and gates used in casting. (06 Marks)

Module-2

- 3 a. Write the classification of furnaces used in melting. Sketch and explain the working principle of Electric Arc Furnace. (08 Marks)
- b. With neat sketch, explain the construction and working principle of cupola. (12 Marks)

OR

- 4 a. Sketch and explain cold chamber pressure die casting process. (07 Marks)
- b. With neat sketch briefly explain centrifugal casting process. (06 Marks)
- c. Sketch and explain the working principle of continuous casting process. (07 Marks)

Module-3

- 5 a. What is solidification? Sketch and explain progressive and directional solidification. (07 Marks)
- b. List the casting defects. Explain the causes and remedies for shrinkage and hot tear defects. (07 Marks)
- c. Mention the advantages and limitations of casting process. (06 Marks)

OR

- 6 a. What is Dressing? Mention the advantages, disadvantages and applications of aluminium castings. (07 Marks)
- b. Briefly explain "Fluxing and Flushing" and 'Grain refinement' in aluminium foundry practice. (06 Marks)
- c. Sketch and explain Stir Casting Process. Also mention advantages and disadvantages. (07 Marks)

Module-4

- 7 a. What is welding? Mention the classification of welding methods. (06 Marks)
- b. With a neat sketch briefly explain "Submerged Arc Welding". (07 Marks)
- c. Sketch and explain "Tungsten Inert Gas" (TIG) welding. (07 Marks)

OR

- 8 a. With neat sketch, briefly explain the principle of resistance welding. Mention any two advantages and disadvantages. (07 Marks)
- b. Distinguish between spot welding and seam welding. (06 Marks)
- c. Sketch and explain "electron beam welding". (07 Marks)

Module-5

- 9 a. Sketch and explain "Heat Affected Zone (HAZ)" during welding. (07 Marks)
- b. Explain the effect of carbon content on structure and properties of steel with respect to welding. (07 Marks)
- c. Briefly explain Shrinkage and Residual Stresses in welds. (06 Marks)

OR

- 10 a. Sketch and explain the principle of 'Gas Welding'. (06 Marks)
- b. Differentiate between Soldering, Brazing and Welding. (06 Marks)
- c. Sketch and explain the principle of X-ray radiography. (08 Marks)

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