Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 50786

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.

Fifth/Sixth Semester

Mechanical Engineering

CME 395 – CASTING AND WELDING PROCESSES

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What's meant by solidification?

2. List any two properties of stainless steel.

3. Write the characteristics of nickel base alloy.

4. Define residual stress.

5. List the uses of CCT diagram.

6. Write any two roles of carbon equivalent in the welding process.

7. What are the three most common ways to weld stainless steel?

8. List two examples of martensitic.

9. List the defects in welded joints.

10. Write the purpose of testing weldments.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Describe the solidification of phenomena that affect the soundness of a casting. (7)

(ii) Describe the supercooling process. (6)

Or

(b) (i) Describe Niyama's criteria for predicting shrinkage porosity. (7)

(ii) Describe the process of desulphurizing hot metal. (6)

12. (a) (i) Describe the casting process for copper casting. (7)

(ii) Describe the casting process for magnesium alloy. (6)

Or

(b) Explain the various fields of application for aluminum alloys.

13. (a) Discuss the iron-iron carbide diagram with a neat sketch.

Or

(b) Describe the effect of acicular ferrite formation on weld metal toughness.

14. (a) Explain submerged arc welding with neat diagrams and list the applications.

Or

(b) Discuss the weldability considerations of

(i) Aluminum (4)

(ii) Zinc aluminum (5)

(iii) Nickel silver. (4)

15. (a) Discuss the causes and remedy for the following defects

(i) Arc strike (7)

(ii) Undercut. (6)

Or

(b) Discuss the factors to be considered for the joining of dissimilar materials.

PART C — (1 × 15 = 15 marks)

16. (a) Identify and analyze the welding process widely used for railway track repairs.

Or

(b) As a butt joint, mild steel metal of 7 mm thickness needs to be joined, Illustrate;

(i) The Selection of the welding process, its parameters and approximate values (6)

(ii) Type of filler wire and welding preparations (5)

(iii) Precautions for weld defects and residual stresses. (4)

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