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

Question Paper Code : 30942

M.E./M.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022

First Semester

Manufacturing Engineering

MF 4102 – ADVANCES IN CASTING AND WELDING

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the effects of mould materials on fluid flow and heat transfer?
2. List any four desirable properties of moulding sand.
3. What is the difference between the solidification of pure metals and alloys?
4. What is meant by degasification in metal casting process?
5. Name any four material handling equipments used in a foundry.
6. What is the effects of Hydrogen embrittlement in welding?
7. Define Lamellar tearing.
8. What is weld decay in Austenitic stainless steels?
9. Mention the difference between Induction, Dip resistance and Diffusion processes.
10. What is the principle of plasma welding?

PART B — (5 × 13 = 65 marks)

11. (a) What are important considerations for a riser to function properly? Explain in detail.

Or

(b) Explain about the design requirements for a gating system with neat sketches.

12. (a) (i) How shrinkage is formed in casting? Explain. (6)

(ii) Write a note on progressive and directional solidification in casting with neat sketch. (7)

Or

(b) Explain the Castability of

(i) Al alloys (4)

(ii) Babbitt alloy (4)

(iii) Cu alloy (5)

13. (a) (i) Explain the Shell moulding process with neat sketch. (6)

(ii) Which casting methods are preferable to produce the surgical instruments that have to be more précised in size and shape? Explain. (7)

Or

(b) (i) Enumerate the different types of pollution caused in casting industry. How it can be controlled? (7)

(ii) Write a note on automation in casting design with the help of computers. (6)

14. (a) Discuss the weldability aspects of magnesium and titanium alloys. Enumerate the micro structural changes that take place in heat affected zone.

Or

(b) (i) What is distortion? How can it be controlled? Explain in detail. (6)

(ii) Illustrate the analysis of stress in welded structures with a suitable sketch. (7)

15. (a) Explain the process of High frequency induction welding with a neat sketch. List out the parameters and state its applications.

Or

(b) How welding process can be automated in underwater? Explain the principle involved in underwater welding with suitable diagram.

PART C — (1 × 15 = 15 marks)

16. (a) Explain the principle, process and parameters involved in centrifugal casting process with a neat sketch. State its applications.

Or

(b) Discuss the various method of designing the layout of mechanized foundry with suitable example.
