

Hall Ticket Number:

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Code No. : 22858

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD*Accredited by NAAC with A++ Grade***M.E. (Mech. Engg.) II-Semester Main Examinations, September-2022****Metallurgy of Casting and Welding**

(Advanced Design & Manufacturing)

Time: 3 hours

Max. Marks: 60

*Note: Answer all questions from Part-A and any FIVE from Part-B***Part-A (10 × 2 = 20 Marks)**

| Q. No. | Stem of the question | M | L | CO | PO |
|----------------------------------|---|---|---|----|----|
| 1. | Explain the significance of phase diagram. | 2 | 2 | 1 | 2 |
| 2. | Define the Cast iron and various types of cast irons. | 2 | 1 | 1 | 4 |
| 3. | Analyse the requirements of foundry refractories. | 2 | 4 | 2 | 2 |
| 4. | What is the composition of Duralumin? | 2 | 1 | 2 | 2 |
| 5. | Distinguish between plastic welding & fusion welding. | 2 | 4 | 3 | 3 |
| 6. | What are the causes of heat affected zone? | 2 | 1 | 3 | 3 |
| 7. | What are the forces causing stresses in welded joints? | 2 | 1 | 4 | 3 |
| 8. | Distinguish between ferrite and delta ferrite. | 2 | 4 | 4 | 3 |
| 9. | Show the 5 causes of weld crack. | 2 | 2 | 5 | 2 |
| 10. | How do you stop a weld from cracking? | 2 | 3 | 5 | 3 |
| Part-B (5 × 8 = 40 Marks) | | | | | |
| 11. a) | Construct Iron carbon Equilibrium Diagram with neat sketch and mention various invariant reactions. | 4 | 4 | 1 | 3 |
| b) | Classify Various types of cast irons and its properties. | 4 | 2 | 1 | 3 |
| 12. a) | Explain the steps involved in age hardening process? | 4 | 2 | 2 | 2 |
| b) | Explain Nickel chromium high temperatures alloys, properties and its applications. | 4 | 2 | 2 | 2 |
| 13. a) | Differentiate between Austempering and Martempering. | 4 | 3 | 3 | 2 |
| b) | Distinguish between Annealing and normalizing. | 4 | 4 | 3 | 2 |
| 14. a) | Explain the effect of alloying elements on weldments. | 4 | 2 | 4 | 4 |
| b) | Define the term Schaeffler diagram and how it is useful for practical applications. | 4 | 3 | 4 | 3 |

Contd... 2

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| 15. a) | Explain the most common type of weld cracks and suggest remedies to avoid the same. | 4 | 2 | 5 | 2 |
| b) | Explain The weld ability aspects of aluminum alloys and titanium alloys | 4 | 2 | 5 | 2 |
| 16. a) | Define the term degasification and various processes. | 4 | 1 | 1 | 3 |
| b) | Define the term heat treatment and various applications of the Heat treatment. | 4 | 3 | 2 | 3 |
| 17. | Answer any <i>two</i> of the following: | | | | |
| a) | Explain various welding zones in detail. | 4 | 2 | 3 | 3 |
| b) | Differentiate the microstructures of Austenite, Pearlite and Martensite. | 4 | 4 | 4 | 2 |
| c) | What is hot cracking and cold cracking? | 4 | 1 | 5 | 2 |

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

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| i) | Blooms Taxonomy Level – 1 | 20% |
| ii) | Blooms Taxonomy Level – 2 | 40% |
| iii) | Blooms Taxonomy Level – 3 & 4 | 40% |
