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Question Paper Code: R3702

B.E. / B.Tech. DEGREE EXAMINATION, APRIL / MAY 2025

Second Semester

Mechanical Engineering

R21UME302 –FUNDAMENTALS OF MANUFACTURING PROCESSES

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The replica of the part to be cast is called ____ CO1- U
(a) Mould (b) Core (c) Spruce (d) pattern
2. An expandable mould is used in ____ CO1- U
(a) Sand casting (b) Die casting (c) Centrifugal casting (d) Permanentmould casting
3. Argon gas used in TIG welding for welding CO2-U
(a) Aluminium (b) Steel (c) CI (d) Titanium
4. The source of heat in thermit welding is ____ CO2-U
(a) Electric arc (b) Electric resistance heating
(c) Chemical flame (d) An exothermic chemical reaction
5. Good surface finish and better dimensional accuracy can be achieved in CO3-U
(a) cold working process (b) Hot working process
(c) Both (a) and (b). (d) none of the above
6. In sheet metal blanking, shear is provided on punches and dies so that CO3- U
(a) Press load is reduced (b) Good cut edge is obtained
(c) Warping of sheet is minimized (d) Cut blanks is straight

7. Which forming process uses a rubber pad to press the sheet metal into the die shape? CO4- U
 - a) Explosive forming
 - b) Hydroforming
 - c) Rubber pad forming
 - d) Magnetic pulse forming
8. What is the main advantage of hydroforming over traditional stamping? CO4- U
 - a) Lower tooling cost
 - b) Requires more force
 - c) Limited to small components
 - (d) Cannot produce complex shapes
9. Which of the following is a thermoplastic? CO5- U
 - (a) Bakelite
 - (b) Epoxy resin
 - (c) Polyethylene
 - (d) Melamine
10. Thermoforming is used to make: CO5- U
 - (a) Solid rods
 - (b) Hollow objects
 - (c) Thin plastic packaging and trays
 - (d) Engine components

PART – B (5 x 2= 10 Marks)

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| 11. Explain the uses of runner and riser? | CO1- U |
| 12. Evaluate why spot welding is commonly used in automotive bodies? | CO2- U |
| 13. Explain the role of a mandrel in tube drawing. | CO3 -U |
| 14. Compare and contrast deep drawing with metal spinning in terms of process mechanisms, advantages, and limitations. | CO4 -U |
| 15. Describe applications of transfer moulding. | CO5 -U |

PART – C (5 x 16= 80Marks)

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| 16. | (a) | Explain the sand casting process hand tools and also explain the process of making a Solid pattern with a suitable sketch. | CO1- U | (16) |
| | | Or | | |
| | (b) | Explain the various types of patterns used in mould making with a neat diagrams. | CO1- U | (16) |
| 17. | (a) | Explain how welding defects happen and suggest possible ways to rectify the welding defects. Support your answers with a Suitable diagrams. | CO2- U | (16) |
| | | Or | | |
| | (b) | Explain resistance Spot Welding with a suitable Sketch. | CO2- U | (16) |

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| 18. | (a) | Explain precision forging process and also Mention the advantages and limitations of closed die forging | CO3- U | (16) |
| | | Or | | |
| | (b) | Select the types of Rolling mills and Summarize the various defects in rolled parts | CO3- U | (16) |
| 19. | (a) | Explain the metal spinning operation with a diagram | CO4- U | (16) |
| | | Or | | |
| | (b) | Explain in detail about the Coining and Embossing Processes. | CO4- U | (16) |
| 20. | (a) | Explain briefly the plunger type injection, moulding process for producing plastics components. State its advantages and limitations. | CO5- U | (16) |
| | | Or | | |
| | (b) | Explain the various types of thermo forming methods for shaping the thermoplastics. | CO5- U | (16) |

