

GUJARAT TECHNOLOGICAL UNIVERSITY

DI -3 SEMESTER – OLD PAPER – S23 TO S25 – QUESTION BANK(English)

Subject Name & Code:

Manufacturing Engineering-I -4331903

Unit I - Introduction

Repeated Questions:

1. **Define/Explain Recrystallization Temperature and the factors affecting it.**
 - Appeared in: SUM23 (Q1b, 04 Marks), WIN23 (Q1j, 03 Marks), SUM25 (Q1a, 03 Marks)
2. **Define Manufacturing Process and give its classification.**
 - Appeared in: WIN23 (Q1a, 04 Marks), WIN24 (Q1b, 04 Marks)
3. **Differentiate between Hot Working and Cold Working processes.**
 - Appeared in: SUM23 (Q2a & Q2a(OR), 03 Marks), WIN23 (Q3c, 07 Marks)

Other Important Questions:

1. Explain the term polymerization and discuss the various methods of polymerization. (SUM23 - Q1a, 03 Marks)
2. List the various mechanical properties & define Strength and Toughness. (SUM24 - Q1b, 04 Marks)
3. Explain any four mechanical properties of metals. (SUM25 - Q1b, 04 Marks)
4. Define: a) Residual Stresses b) Flash in forging (SUM25 - Q1a, 03 Marks)
5. State the effect of residual stresses on the manufacturing process. (SUM24 - Q2a, 03 Marks)
6. State the effect of recrystallization temperature on the working of metals. (SUM24 - Q2a(OR), 03 Marks)

Unit II - Metal Forming Processes

Repeated Questions:

1. **Explain the Hot Rolling process (principle, advantages, disadvantages).**
 - Appeared in: SUM23 (Q1c, 07 Marks), SUM24 (Q1c, 07 Marks)
2. **Explain the Cold Rolling process (principle, advantages, disadvantages).**
 - Appeared in: SUM23 (Q1c(OR), 07 Marks), SUM24 (Q1c(OR), 07 Marks)
3. **Explain the Wire Drawing process with a neat sketch.**
 - Appeared in: WIN23 (Q1i, 07 Marks), SUM25 (Q2c(OR), 07 Marks)
4. **Define the Forging process and explain Drop Forging.**
 - Appeared in: SUM24 (Q2c(OR), 07 Marks), WIN24 (Q1c, 07 Marks)
5. **List the factors affecting the Rolling/Drawing process.**
 - Appeared in: SUM23 (Q1c(OR), 07 Marks), WIN23 (Q1d, 03 Marks), WIN24 (Q2a(OR), 03 Marks)

Other Important Questions:

1. List the various types of rolling mills and explain any two. (SUM23 - Q1c, 07 Marks)
2. Explain: ingot, billet, bloom, slab. (SUM23 - Q2b, 04 Marks)
3. Simplify the forging? List the sequence of operation in manufacturing a hexagonal bolt and a link for a chain. (SUM23 - Q2c, 07 Marks)
4. Write a short note on Tube Drawing. (SUM24 - Q1a, 03 Marks)
5. Define the Extrusion process & Explain Forward Extrusion with a sketch in detail. (SUM24 - Q2c, 07 Marks)
6. Explain the Extrusion moulding process with a neat sketch. (SUM24 - Q2b(OR), 04 Marks)
7. Explain the process of manufacturing a hexagonal bolt by smith forging process. (WIN24 - Q1c(OR), 07 Marks)
8. Explain the process of making a chain by forging. (WIN24 - Q2c, 07 Marks)
9. Name at least seven components produced by the drawing operation and the type of drawing process used for each of them. (WIN24 - Q2c(OR), 07 Marks)
10. State the common defects found in forging. Explain any four defects. (SUM25 - Q2c, 07 Marks)
11. Define 1) Punching 2) Blanking 3) Nibbling (SUM25 - Q4a, 03 Marks)
12. Choose the best forging technique to manufacture a fixed spanner and describe it. (SUM25 - Q4b, 04 Marks)
13. Choose the best forging technique to manufacture railway tracks (I-section) and describe it. (SUM25 - Q4b(OR), 04 Marks)

14. Classify metal forming processes. (SUM25 - Q4a(OR), 03 Marks)
15. Explain the manufacturing of a collapsible tube by the impact extrusion process. (WIN23 - Q1s, 03 Marks)
16. Explain the terms (i) Embossing (ii) Shearing (iii) Bending (WIN23 - Q1g, 03 Marks)
17. Describe the Four-High rolling mill with a figure. (WIN24 - Q2a, 03 Marks)
18. Differentiate between Hot and Cold rolling process. (WIN24 - Q1a, 03 Marks)

Unit III - Metal Casting Processes

Repeated Questions:

1. **Explain the Centrifugal Casting process.**
 - Appeared in: SUM23 (Q4c, 07 Marks), SUM24 (Q3a, 03 Marks), SUM25 (Q1c, 07 Marks)
2. **Explain the Pattern Allowances and their types/purposes.**
 - Appeared in: SUM23 (Q3c, 07 Marks), WIN23 (Q4c, 07 Marks), SUM25 (Q3c, 07 Marks)
3. **Explain the Cupola Furnace (Zones, working, chemical reactions).**
 - Appeared in: SUM23 (Q3c(OR), 07 Marks), SUM24 (Q4c, 07 Marks), WIN24 (Q3c, 07 Marks)
4. **Explain the Gating System with a sketch and its components.**
 - Appeared in: SUM23 (Q4b, 04 Marks), WIN23 (Q1h, 04 Marks), WIN24 (Q3a, 03 Marks), SUM25 (Q3c(OR), 07 Marks)
5. **Explain the types of Patterns.**
 - Appeared in: WIN24 (Q2b, 04 Marks), SUM25 (Q1c(OR), 07 Marks)

Other Important Questions:

1. Define: blow holes, misrun, fins. (SUM23 - Q4a, 03 Marks)
2. Classify the color code of the core / pattern. (SUM23 - Q3b, 04 Marks)
3. Explain the color code on different surfaces of a pattern. (SUM23 - Q3b(OR), 04 Marks)
4. Classify the types of furnaces used in foundries and discuss the working of an induction furnace. (SUM23 - Q3c(OR), 07 Marks)
5. Explain the Skelton pattern & Sweep pattern with a neat sketch. (SUM24 - Q3c, 07 Marks)
6. Explain Draft allowance with a neat sketch. (SUM24 - Q3a(OR), 03 Marks)
7. Describe the Component of the Gating system with the help of a diagram. (SUM24 - Q3c(OR), 07 Marks)
8. Describe Balanced Core with a neat sketch. (SUM24 - Q4a, 03 Marks)
9. List out Hand tools used in preparing Mould. (SUM24 - Q4a(OR), 03 Marks)
10. Describe Core making process. (SUM24 - Q4c(OR), 07 Marks)
11. List various salvage techniques of casting and explain any one in brief. (WIN24 - Q3b, 04 Marks)
12. List types of cores used in sand casting and explain any one with a figure. (WIN24 - Q3a(OR), 03 Marks)
13. State the color code used for the pattern. (WIN24 - Q3b(OR), 04 Marks)

14. State and describe the types of moulding sands briefly. (WIN23 - Q4a, 03 Marks)
15. State important characteristics of moulding sand. (WIN23 - Q4a(OR), 03 Marks)
16. Draw a neat sketch of a cupola furnace and show all main zones. (WIN23 - Q4b, 04 Marks)
17. State the types of core and briefly describe any one with a neat sketch and its application. (WIN23 - Q4b(OR), 04 Marks)
18. Classify die casting processes and explain hot chamber die casting with a neat sketch. (WIN23 - Q4c(OR), 07 Marks)
19. On which basis you may select metal furnaces in the casting process? Explain with an example. (WIN23 - Q5a, 03 Marks)
20. List the various materials used for pattern-making in metal casting. (SUM25 - Q3a, 03 Marks)
21. Discuss the relative advantages and disadvantages of cupola furnaces and electric furnaces. (SUM25 - Q3b, 04 Marks)
22. Define the casting process and list its benefits and drawbacks. (SUM25 - Q3a(OR), 03 Marks)
23. Select an appropriate casting process to make hollow toys of small thickness and explain it. (SUM25 - Q3b(OR), 04 Marks)
24. State and explain the various tools used in mould-making. (SUM25 - Q3c(OR), 07 Marks)

Unit IV - Non-Metal Moulding Processes

Repeated Questions:

1. **Explain the Injection Moulding process.**
 - Appeared in: SUM23 (Q3a, 03 Marks), WIN23 (Q5a(OR), 03 Marks), WIN24 (Q4a, 03 Marks), SUM25 (Q2a, 03 Marks)
2. **Explain the Blow Moulding process with a neat sketch.**
 - Appeared in: WIN23 (Q3a, 03 Marks), SUM24 (Q2b, 04 Marks), WIN24 (Q4b, 04 Marks)
3. **Explain the Extrusion Moulding process for plastics.**
 - Appeared in: WIN24 (Q4b(OR), 04 Marks), SUM24 (Q2b(OR), 04 Marks)

Other Important Questions:

1. What is compression moulding? List the advantages of injection moulding over the compression moulding process for plastic. (SUM23 - Q3a, 03 Marks)
2. Identify the laminated plastics? State their characteristics and use. (SUM23 - Q3a(OR), 03 Marks)
3. State the advantages and disadvantages of the investment moulding process. (SUM23 - Q2b(OR), 04 Marks)
4. State about types of Plastics in detail. (SUM24 - Q3b, 04 Marks)
5. Write a short note on PVC. (SUM24 - Q3b(OR), 04 Marks)
6. List down the properties of plastic material. (WIN24 - Q4a(OR), 03 Marks)
7. List the applications of HDPE, LDPE, and PP based on their characteristics. (SUM25 - Q2a(OR), 03 Marks)
8. Select an appropriate method to manufacture disposable water bottles (PET) and explain it. (SUM25 - Q2b, 04 Marks)
9. Select the appropriate Extrusion method to manufacture a toothpaste tube and explain it. (SUM25 - Q2b(OR), 04 Marks)

Unit V - Metal Joining Processes

Repeated Questions:

1. **Differentiate between Soldering, Brazing, and Welding.**
 - Appeared in: SUM23 (Q5a, 03 Marks), WIN23 (Q1e, 04 Marks), SUM25 (Q5c, 07 Marks)
2. **Explain the Arc Welding process (principle, setup, advantages, disadvantages).**
 - Appeared in: WIN23 (Q5c, 07 Marks), SUM24 (Q5c, 07 Marks), SUM25 (Q5c(OR), 07 Marks)
3. **Explain TIG (Tungsten Inert Gas) Welding.**
 - Appeared in: WIN23 (Q1k, 04 Marks), WIN24 (Q5a(OR), 03 Marks), SUM25 (Q4c(OR), 07 Marks)
4. **Explain MIG (Metal Inert Gas) Welding.**
 - Appeared in: WIN23 (Q1k, 04 Marks), SUM25 (Q4c, 07 Marks)
5. **Explain Oxy-Acetylene Welding/Gas Welding (setup, techniques, flames).**
 - Appeared in: SUM23 (Q5c, 07 Marks), WIN23 (Q3b, 04 Marks), SUM24 (Q4b, 04 Marks)
6. **List and explain types of Resistance Welding (Spot, Seam, etc.).**
 - Appeared in: SUM23 (Q5c(OR), 07 Marks), WIN23 (Q5b, 04 Marks), WIN24 (Q4c, 07 Marks)

Other Important Questions:

1. Define: Electrode? States consumable and non-consumable electrode. (SUM23 - Q5a(OR), 03 Marks)
2. Explain the welding positioning with a neat sketch. (SUM23 - Q5b, 04 Marks)
3. Describe different gas flames with a sketch. (SUM23 - Q5b(OR), 04 Marks)
4. State the advantages of laser beam welding. (SUM23 - Q4a(OR), 03 Marks)
5. State the function of flux used in submerged arc welding. (SUM23 - Q4b(OR), 04 Marks)
6. What is a welding defect? Explain briefly any four. (SUM23 - Q4c(OR), 07 Marks)
7. Write brief notes on defects in welding, causes, and its remedies. (WIN23 - Q1b, 07 Marks)
8. Explain the Thermit welding process with a neat sketch. (WIN23 - Q5b, 04 Marks)
9. Write down advantages & disadvantages of Thermit welding. (SUM24 - Q5a, 03 Marks)
10. Write a short note on Soldering. (SUM24 - Q5b, 04 Marks)
11. Write a short note on Brazing. (SUM24 - Q5b(OR), 04 Marks)
12. Explain the working principle of Seam welding with a neat sketch. (SUM24 - Q5c(OR), 07 Marks)
13. Explain Forehand & Backhand welding technique with the help of a figure. (SUM24 - Q4b(OR), 04 Marks)
14. State the method of representation of "Weld" as per IS: 813 – 1961. (SUM24 - Q5a(OR), 03 Marks)
15. Differentiate between straight and reverse polarity in arc welding. (WIN24 - Q5a, 03 Marks)
16. Explain the Welding Electrode 6-digit coding system. (WIN24 - Q5b, 04 Marks)
17. State different advanced welding processes and explain any one in detail with figures. (WIN24 - Q5c, 07 Marks)
18. Draw three types of oxy-acetylene flames showing clearly different zones. (WIN24 - Q5b(OR), 04 Marks)
19. List the various welding defects. (SUM25 - Q5a, 03 Marks)
20. Choose an appropriate joining process to make a continuous seam weld on two sheet metal jobs and explain it. (SUM25 - Q5b, 04 Marks)
21. Compare welding, brazing, and soldering processes in terms of various process parameters. (SUM25 - Q5c, 07 Marks)

22. List the various welding joints and draw a sketch of each. (SUM25 - Q5a(OR), 03 Marks)
23. Choose an appropriate joining process to make a low-resistance electric joint and explain the procedure. (SUM25 - Q5b(OR), 04 Marks)
24. Discuss the importance of safety and various safety equipment in metal joining processes. (SUM25 - Q5c(OR), 07 Marks)
