| Reg. No. | | | | | | | | | | | | | | | | |
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| Question Paper Code | 14013 |
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025**

Third Semester

**Mechanical and Automation Engineering**

**24MUPW301 - BASIC MANUFACTURING PROCESSES WITH LABORATORY**

Regulations - 2024

Duration: 3 Hours | Max. Marks: 100

**PART - A (MCQ) (10 × 1 = 10 Marks)**

Answer ALL Questions

| | | Marks | K – Level | CO |
|---|---|---|---|---|
| 1. | Identify the correct pattern material commonly used in sand casting.<br>(a) Plastics (b) Copper (c) Tungsten (d) Stainless steel | 1 | K1 | CO1 |
| 2. | Which welding process uses a consumable electrode and shielding gas?<br>(a) TIG (b) MIG (c) SAW (d) PAW | 1 | K1 | CO1 |
| 3. | Hot working is carried out: Choose the answer.<br>(a) Below the recrystallization temperature (b) Above recrystallization temperature<br>(c) At room temperature (d) In a vacuum | 1 | K1 | CO2 |
| 4. | Identify the forging operation in which the length is increased and the cross-sectional area is reduced.<br>(a) Upsetting (b) Drawing-out (c) Edging (d) Fullering | 1 | K1 | CO2 |
| 5. | Identify the type of chip produced when machining ductile materials like mild steel at high speed.<br>(a) Discontinuous chip (b) Continuous chip<br>(c) Built-up edge chip (d) Powdered chip | 1 | K1 | CO3 |
| 6. | Choose the correct statement about milling cutters.<br>(a) They have a single cutting edge (b) They always rotate the workpiece<br>(c) They are multi-point cutting tools (d) They are used only for drilling | 1 | K1 | CO3 |
| 7. | Identify the parameter represented by the letter 'G' in grinding wheel specifications.<br>(a) Abrasive type (b) Grade (hardness of bond) (c) Structure (d) Bond type | 1 | K1 | CO4 |
| 8. | Choose the broaching method widely used for removing material from flat surfaces.<br>(a) Surface broaching (b) Internal broaching (c) Push broaching (d) Pull broaching | 1 | K1 | CO4 |
| 9. | Define the plastics that undergo permanent chemical change when heated and cannot be remelted.<br>(a) Thermoplastics (b) Elastomers (c) Thermosetting plastics (d) Acrylics | 1 | K1 | CO5 |
| 10. | State the type of machining process that uses high-pressure water jet without abrasives.<br>(a) Abrasive Jet Machining (b) Water Jet Machining<br>(c) Ultrasonic Machining (d) Hybrid Machining | 1 | K1 | CO6 |

**PART - B (12 × 2 = 24 Marks)**

Answer ALL Questions

| | | Marks | K – Level | CO |
|---|---|---|---|---|
| 11. | List the types of pattern allowances. | 2 | K1 | CO1 |
| 12. | Identify the various welding defects. | 2 | K2 | CO1 |
| 13. | Compare hot working with cold working. | 2 | K2 | CO2 |
| 14. | List the main characteristics of sheet metal. | 2 | K1 | CO2 |
| 15. | Compare capstan and turret lathes. | 2 | K2 | CO3 |
| 16. | State the purpose of reaming. | 2 | K1 | CO3 |
| 17. | List any four specifications of a grinding wheel. | 2 | K1 | CO4 |
| 18. | Name the main types of broaching machines. | 2 | K1 | CO4 |
| 19. | Identify the characteristics of plastics. | 2 | K2 | CO5 |
| 20. | List the applications of blow moulding. | 2 | K1 | CO5 |

*K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create*

| | | | | | |
|---|---|---|---|---|---|
| 21. | | List the major process parameters that influence MRR in WJM. | 2 | K1 | CO6 |
| 22. | | What is the function of the transducer in USM? | 2 | K1 | CO6 |

**PART - C (6 × 11 = 66 Marks)**

Answer ALL Questions

| | | | | | |
|---|---|---|---|---|---|
| 23. | a) | Compare pressure die casting and centrifugal casting in terms of working principle. | 11 | K2 | CO1 |
| | | **OR** | | | |
| | b) | Categorize the types of arc welding processes and explain one with a neat sketch. | 11 | K2 | CO1 |
| 24. | a) | Describe the forging process and discuss typical forging operations with neat sketches. | 11 | K2 | CO2 |
| | | **OR** | | | |
| | b) | Explain the typical sheet metal operations, such as shearing and bending, with neat sketches. | 11 | K2 | CO2 |
| 25. | a) | Develop the construction and specification of a center lathe with a neat sketch. | 11 | K3 | CO3 |
| | | **OR** | | | |
| | b) | Construct the various types of milling cutters and explain their applications. | 11 | K3 | CO3 |
| 26. | a) | Compare cylindrical grinding with surface grinding and explain the working principle of surface grinding with a neat sketch. | 11 | K2 | CO4 |
| | | **OR** | | | |
| | b) | Brief how surface integrity influences the final quality of a machined component and describe the working of a surface broaching machine. | 11 | K2 | CO4 |
| 27. | a) | Illustrate the working principle of injection moulding with a neat diagram, and compare plunger-type and screw-type injection moulding machines. | 11 | K2 | CO5 |
| | | **OR** | | | |
| | b) | Describe the rotational moulding process with a neat sketch. | 11 | K2 | CO5 |
| 28. | a) | Model the process parameters influencing Material Removal Rate (MRR) in Abrasive Jet Machining (AJM) and explain its working principle with a neat sketch. | 11 | K3 | CO6 |
| | | **OR** | | | |
| | b) | Develop the construction, working of Ultrasonic Machining (USM) with a simple sketch. | 11 | K3 | CO6 |