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BRAINWARE UNIVERSITY

Term End Examination 2025-2026

Programme – B.Tech.(ME)-2024

Course Name – Manufacturing Processes

Course Code - BTM40107

(Semester IV)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Select the option that correctly defines manufacturing process.
 - a) Conversion of raw material into finished product
 - b) Mining of materials
 - c) Transportation of goods
 - d) Product marketing
- (ii) Identify the principle of metal cutting.
 - a) Plastic deformation and shearing
 - b) Melting and solidification
 - c) Chemical reaction
 - d) Diffusion
- (iii) Apply suitable machining process for cylindrical jobs.
 - a) Milling
 - b) Drilling
 - c) Turning
 - d) Shaping
- (iv) Examine the reason for built-up edge formation.
 - a) High cutting speed
 - b) Low cutting speed
 - c) Excess coolant
 - d) Low feed
- (v) Predict the function of flank angle.
 - a) Reduce friction
 - b) Increase chip thickness
 - c) Increase strength
 - d) Increase speed
- (vi) Select suitable machining process for flat surfaces.
 - a) Turning
 - b) Milling
 - c) Drilling
 - d) Boring
- (vii) Recall the definition of machining defects.
 - a) Desired outcomes
 - b) Undesirable features
 - c) Tool properties
 - d) Material properties
- (viii) Define gating system in casting.
 - a) Mold cavity
 - b) Metal solidification zone

- c) Channel for molten metal flow
- d) Riser location
- (ix) Identify a permanent mold casting process.
 - a) Sand casting
 - b) Shell molding
 - c) Gravity die casting
 - d) Investment casting
- (x) Predict the effect of current on weld bead size.
 - a) Higher current = smaller bead
 - b) Higher current = larger bead
 - c) No effect
 - d) Depends on electrode
- (xi) Identify the process in which a continuous wire electrode is used.
 - a) TIG
 - b) SAW
 - c) SMAW
 - d) Resistance welding
- (xii) Predict the primary objectives of advanced welding processes.
 - a) Reduce heat input
 - b) Increase spatter
 - c) Manual operation
 - d) Lower productivity
- (xiii) Identify the effects of failure in layer bonding in AM process.
 - a) Accuracy
 - b) Surface roughness
 - c) Mechanical strength
 - d) Build speed
- (xiv) Identify the material most suitable for extrusion.
 - a) Glass
 - b) Plastic
 - c) Mild steel
 - d) Rubber
- (xv) Predict the importance of providing lubrication in forming operations.
 - a) Increases friction
 - b) Prevents sticking and reduces wear
 - c) Removes scale
 - d) None

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Recall materials commonly used for making patterns. (3)
3. Explain the function of flux in SMAW. (3)
4. Differentiate between additive and subtractive manufacturing. (3)
5. A component fabricated using FDM has a volume of 120 cm^3 . If the material deposition rate is $4 \text{ cm}^3/\text{min}$, calculate the total deposition time. (3)
6. Explain the function of cutting tool materials in machining. (3)

OR

- Analyse the effect of increasing depth of cut from 1 mm to 2 mm on material removal rate (MRR), keeping feed and speed constant. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. In a turning process using orthogonal tool geometry, a chip length of 100 mm is obtained for an uncut chip length of 250 mm. The cutting conditions are a cutting speed of 30 m/min and a rake angle of 20° . Determine the shear plane angle in degrees (round off to one decimal place) (5)
8. Identify the common machining defects and their causes. (5)
9. Demonstrate extrusion setup construction and working. (5)
10. Demonstrate how to inspect weld quality using non-destructive testing (NDT) methods. (5)
11. Analyze the influence of welding parameters on distortion and residual stress. (5)
12. Analyze the effect of feed rate on material removal rate (MRR) during a turning operation if depth of cut = 2 mm, feed = 0.3 mm/rev, spindle speed = 500 rpm, and workpiece diameter = 50 mm. (5)

OR

Evaluate the machining time required to turn a cylindrical bar of length 300 mm with feed 0.25 mm/rev at 400 rpm. Justify whether increasing spindle speed is beneficial. (5)

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