

**MODERN MANUFACTURING TECHNOLOGY
(MECH 4222)**

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 4 (four) from Group B to E, taking one from each group.*

Candidates are required to give answer in their own words as far as practicable.

Group – A

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- (i) The ability of a material to absorb energy and plastically deform without fracturing is termed as
 - (a) Elasticity
 - (b) Hardness
 - (c) Toughness
 - (d) Ductility
- (ii) The mechanism that controls the tool movement in a shaper machine is known as:
 - (a) Gear train
 - (b) Feed mechanism
 - (c) Quick return mechanism
 - (d) Drive mechanism
- (iii) Which one of the following is not a Oxy-acetylene gas welding flame
 - (a) Oxidizing
 - (b) Carburizing
 - (c) Neutral
 - (d) Nitriding
- (iv) What is the relationship between CAD/CAM
 - (a) Design and marketing
 - (b) Development and marketing
 - (c) Design and manufacturing
 - (d) Development and machining
- (v) Cellular manufacturing is mostly used in
 - (a) Mass production
 - (b) Batch production
 - (c) Job shop production
 - (d) All of the above
- (vi) “M code” and “G code” is related to
 - (a) NC program
 - (b) CNC program
 - (c) Rapid prototyping
 - (d) Group technology
- (vii) Mechanics of material removal in electric discharge machining (EDM) is
 - (a) Melting and evaporation aided by cavitation
 - (b) Mechanical cutting action
 - (c) Melting
 - (d) Electrolysis

- (viii) Abrasive Jet Machining (AJM) uses a jet of
 - (a) Abrasive particles suspended in oil
 - (b) Abrasive particles mixed with glycerine
 - (c) Abrasive particles suspended in water
 - (d) Abrasive particles mixed with air.
- (ix) LASER stands for
 - (a) Light amplification by stimulated emission of radiation
 - (b) Light amplification by stimulated erosion of reaction
 - (c) Light amplification by stimulated erosion of radiation
 - (d) Light amplification by stimulated emission of reaction
- (x) Electron Beam Machining (EBM) process is generally carried out in
 - (a) Air atmosphere
 - (b) Vacuum chamber
 - (c) Water medium
 - (d) Oil bath

Fill in the blanks with the correct word

- (xi) Element of machine which is used to convert high frequency electrical impulse into mechanical vibration in Ultrasonic machining is known as _____.
- (xii) Neutral flame in gas welding is created when _____.
- (xiii) In Electrochemical Machining (ECM), the material is removed by the process of _____.
- (xiv) The taper provided on the pattern for its easy removal from mold is called _____ allowance.
- (xv) The dielectric fluid commonly used in EDM is _____.

Group - B

- 2. (a) Propose a setup and explain the working principle for any one forming process. [[CO1] (Create/HOCQ)]
 (b) Explain quick return mechanism of a shaping machine. [[CO1] (Understand/LOCQ)]

6 + 6 = 12
- 3. (a) Explain longitudinal and cross feed of lathe with neat sketch. [[CO1] (Understand/LOCQ)]
 (b) Differentiate between hardness and toughness. [[CO2] (Analyse/IOCQ)]

6 + 6 = 12

Group - C

- 4. (a) Justify the reason to choose CNC over Traditional machines. [[CO3] (Evaluate/HOCQ)]
 (b) Explain the steps of “fused deposition modelling” with figure. [[CO3] (Understand/LOCQ)]

6 + 6 = 12
- 5. (a) What is the importance of cellular manufacturing as an application of group technology? [[CO4] (Evaluate/HOCQ)]

- (b) Explain “Opitz coding and classification system” in group technology. [[CO4] (Understand/LOCQ)]
6 + 6 = 12

Group - D

6. (a) Explain how the material removal process occurs in ultrasonic machining (USM) process. [[CO5] (Evaluate /HOCQ)]
(b) Identify the types of materials that are suitable for electric discharge machining (EDM) and discuss the factors that affect the efficiency of the process. [[CO5] (Understand/LOCQ)]
6 + 6 = 12
7. (a) State the working principle and the factors that affect the material removal rate in the electro chemical machining (ECM) process. [[CO5] (Evaluate /HOCQ)]
(b) State the application areas and limitations of electric discharge machining (EDM) process. [[CO5] (Understand/LOCQ)]
6 + 6 = 12

Group - E

8. (a) Explain Electro-Magnetic forming process. [[CO6] (Understand/LOCQ)]
(b) Explain why vacuum is needed in electron beam machining (EBM) Process? [[CO5] (Analyse/IOCQ)]
6 + 6 = 12
9. (a) Write down the advantages, limitations and application areas of plasma arc machining (PAM). [[CO5] (Remember/LOCQ)]
(b) Demonstrate the set-up and principle of the Electro-Magnetic forming process with figures. [[CO6] (Apply/IOCQ)]
6 + 6 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	50	18.75	31.25

