

**ADVANCED WELDING TECHNOLOGY
(MECH 4141)**

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.*

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

**Group - A
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) The residual stress generated due to welding can be removed by
(a) Pre heating (b) Post weld heat treatment
(c) Using inert gas during welding (d) Keeping a slow welding speed.
- (ii) TIG welding is best suited for welding
(a) Mild steel (b) Cast iron (c) Carbon steel (d) Aluminium.
- (iii) Too high welding current in arc welding would result in
(a) Excessive piling up of weld metal, poor penetration, wasted electrodes
(b) Excessive spatter, under cutting along edges, irregular deposits, wasted electrodes.
(c) Too small bead, weak weld, and wasted electrodes
(d) Vaporising of electrode.
- (iv) For underwater welding which of the following process is not used?
(a) Electroslag welding (b) Shielded metal arc welding (SMAW)
(c) Gas tungsten arc welding (GTAW) (d) Gas metal arc welding (MIG).
- (v) Which process allows fusion welds of great depth with minimum width?
(a) Electron beam welding (b) Ultrasonic welding
(c) Plasma arc welding (d) Friction welding.
- (vi) In reverse polarity welding
(a) Electrode holder is connected to the negative and work to positive
(b) Electrode holder is connected to the positive and work to negative
(c) Work is positive and holder is earthed
(d) Holder is positive and work is earthed.
- (vii) The most commonly used flame in gas welding is
(a) Neutral (b) Oxidising
(c) Carburising (d) All of the above.

- (viii) Which of the carbon steel is easiest to weld?
(a) Low carbon steel (b) Medium carbon steel
(c) High carbon steel (d) None of them.
- (ix) Developer is applied in which of the following welding inspection test
(a) Magnetic particle test (b) Radiography test
(c) Dye penetration test (d) Ultrasonic test.
- (x) CO₂ lasers employs gas mixture of
(a) Nitrogen and helium (b) Hydrogen and helium
(c) Argon and xenon (d) Oxygen and nitrogen.

Group - B

2. (a) Distinguish between TIG & MIG (any four points).
(b) Briefly discuss SAW with a neat sketch. **6 + 6 = 12**
3. (a) Enlighten about the advantages of projection welding over spot welding (any three).
(b) State any three application of seam welding. **6 + 6 = 12**

Group - C

4. (a) State the working principle of USW with a neat sketch.
(b) Elaborate the method of spin welding in a sequential manner with neat sketch. **6 + 6 = 12**
5. (a) Write the application of EBW. (any three)
(b) Enlighten about the advantages of USW. **6 + 6 = 12**

Group - D

6. (a) Explain HAZ with suitable diagram.
(b) How does arc current affect the characteristics of the weldment? **6 + 6 = 12**
7. (a) Explain any two types of welding jigs with neat sketch.
(b) Suggest measures to be taken for Oxy-Acetylene gas welding of Aluminium and its alloys. **6 + 6 = 12**

Group - E

8. (a) Differentiate between destructive and non destructive testing with examples (two examples each).
(b) State the advantages of visual inspections. (any three) **6 + 6 = 12**
9. (a) What are the different types of weld cracks ? How the cracks in the welding can be reduced?
(b) Write any four safety measures that are to be followed in welding shop. **(3 + 3) + 6 = 12**

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