

Roll No.

Total No. of Pages : 02

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M.Tech. (ME) (Sem.-2,3)
ADVANCED WELDING TECHNOLOGY

Subject Code : MTME-205

M.Code : 74981

Date of Examination : 13-07-22

Time : 3 Hrs.

Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWENTY marks.

1. a) What are various factors that define the quality of weld? Explain in detail with diagram.
b) Explain various destructive and non-destructive testing techniques for welding joints. Out of these two broad categories, which one is better and why? Justify your answer.
2. a) What are various allied welding processes? Explain each with suitable application.
b) What is the mechanism of arc initiation and maintenance?
3. a) A welding operation is being performed with 30V and 150A on carbon steel sheet with carbon steel electrode. The cross-sectional area of weld bead is 25mm^2 . Estimate the weld speed if efficiency is 75%. Take sp. Energy for A1 as 9.7J/mm^3 .
b) What is preheating of welding? For what material and for which process it is necessary? Justify your answer.
4. a) Explain the principle, theory and technique of Electron beam welding process.
b) Explain influence of temperature distribution across a welded structure based on weld geometry.
5. a) What is effect of thermal conductivity of work-piece on *kerf width* in oxy-fuel gas cutting? Explain.
b) “Could you use oxyfuel gas cutting for stack of sheet metals”? Explain and justify.

6. a) Assume two 1mm steel sheets are being spot welded at a current of 5000A and for a current flow time of 0.1s. Using 5mm diameter electrode estimate the heat generated and its distribution in weld zone.
- b) If a material to be welded is preheated, is the likelihood for porosity increases or decreases? Explain.
7. a) A welding operation is being performed with 20V and 200A on aluminum sheet with aluminum electrode. The cross-sectional area of weld bead is 30mm². Estimate the weld speed if efficiency is 75%. Take sp. Energy for A1 as 2.9J/mm³.
- b) Rank all the welding processes in terms of
- Cost
 - Weld quality.
8. a) How do you select the electrodes for different welding processes? What are the factors needed to be take care into consideration in selection of electrodes?
- b) What are advantages of electron-beam and laser-beam welding over arc welding?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.