



Printed Pages : 3

ME – 033

(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 4066**

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**B. Tech.**

(SEM. VIII) EXAMINATION, 2006-07

**ADVANCED WELDING TECHNOLOGY***Time : 3 Hours]**[Total Marks : 100*

*Note : Attempt all 5 questions, choice(s) are within. Answer briefly but illustrate it with figures wherever needed. Marks are indicated therein.*

**1** Write brief notes on any **four** of the following: **5×4=20**

- (a) Gas welding and cutting
- (b) Arc welding (AC & DC)
- (c) Forces and modes of metal-transfer in Arc welding.
- (d) Resistance welding.
- (e) MIG versus TIG welding.
- (f) Welding equipments and accessories.
- (g) Soldering and Brazing.

**2** Answer any **two** of the following : **10×2=20**

- (a) Explain the principle behind generation of LASER and also write its various applications. Describe Laser Beam Welding.

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- (b) Describe principle, working and applications of Electron Beam Welding. What are the possible problems/difficulties in it and how it can be dealt with?
- (c) What is ultrasonic waves/vibrations and how it is generated, and what are its various applications? Describe Ultrasonic Welding.

3 Answer any **two** of the following : **10×2=20**

- (a) Describe the principle, working and applications of Explosive Welding/Cladding. What is the importance of re-entrant jet in it?
- (b) What do you mean by Underwater Welding and write when and where it is important? Describe wet-underwater welding and mention how arc-stability could be improved in it?
- (c) Describe how spray-welding/deposition (metallizing) techniques are done. Explain how metallizing is quite useful for reclamation of worn-out components.

4 Answer any **two** of the following : **10×2=20**

- (a) Briefly describe the various defects and distortion in welding and its causes and remedies.
- (b) Draw symbols and sketches and write the design considerations/formulae for Lap-joint and Butt-joint. How life prediction/estimation can possibly be done?
- (c) Draw characteristic (current-voltage) curve of Arc and of power-resources. Explain how are stability/maintenance could be understood/achieved?

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5 Answer any **two** of the following : **10×2=20**

- (a) Draw temperature distribution on plate around the arc/weld at an instant. Explain what do you mean by heating-rate and cooling rate, and that how it affects the properties of weld?
- (b) Draw(two) neat sketches of welded butt-joint of similar parent-metals showing the micro/macro structure of grains of the regions of Weld, HAZ and Parent-metal :
  - (i) Cold-worked pure metals and
  - (ii) Precipitation-hardened alloys.which region is weakest and why? Why railway-bridge is not welded joint but rivitted-joint?
- (c) Write the problems and precautions/steps/solutions to be taken
  - (i) for welding of cast-irons and
  - (ii) for welding of stainless-steels.