B. Tech.

(SEM. VIII) EXAMINATION, 2006-07
ADVANCED WELDING TECHNOLOGY

Time : 3 Hours] [Total Marks : 100

Notes : (1) Attempt all questions.
(2) All questions carry equal marks.

1. Write brief notes on all of the following : \(2 \times 10 = 20\)
   (a) Heterogenous weld
   (b) Arc blow
   (c) Straight and reverse polarity
   (d) Welding position
   (e) Flux and its purpose
   (f) Difference in TIG and MIG welding
   (g) High Frequency Induction Welding (HFIW)
   (h) Braze welding.
   (i) Advantages of welding
   (j) Resistance spot welding.

2. Attempt any two parts of the following : \(10 \times 2 = 20\)
   (a) Explain the principle of non-vacuum electron beam welding. What are its advantages ?
   (b) Explain principle and operation of LASER beam welding with its advantages and limitation.

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(c) Explain the term 'transferred modes' and 'non-transferred modes' used in plasma Arc welding. What is 'Plasma'? Describe plasma arc welding.

3. Attempt any four parts of the following: \(5 \times 4 = 20\)
   (a) The electrode M 32432 P is being used for a certain process. What information do you get from various letters and numbers of the above I. S. Code?
   (b) What do you understand by friction welding? Where is it suitable? Discuss its principles.
   (c) Give the characteristics of Underwater welding. Discuss some common problems encountered in Underwater welding.
   (d) Explain the term 'Hardfacing'. Where it is used in Sugar Industries. What are the various methods of 'Hardfacing'.
   (e) Discuss the mechanism of explosive welding. Write the name of some explosives used. Discuss limitations and applications of explosive welding.
   (f) Explain the term 'Flame Spraying'. What is the difference between 'wire flame spraying' and 'power flame spraying'. Discuss the application of 'Flame spraying'.

4. Attempt any two of the following: \(10 \times 2 = 20\)
   (a) Explain radiography, ultrasonic and magnetic particles inspection test used to inspect welding joints.
(b) Explain why in welding of certain materials, preheating, post-heating and normalizing are essential.
(c) Explain the effect of recrystallization and grain structure on weld properties.

5. Attempt any four parts of the following: $5 \times 4 = 20$
(a) Define weldability of material and the factors on which weldability depends.
(b) Explain HAZ with a neat figure.
(c) Mention the design considerations to be made to get quality weld.
(d) Mention normally encountered welding defects and remedial measures taken.
(e) Explain weld decay in stainless steel and how it is controlled.
(f) What are the causes of residual stress in welding? Explain any two measuring techniques.