Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 08

M.Tech (ME) (2017 Batch) (Sem.–2,3)

ADVANCED WELDING TECHNOLOGY

Subject Code : MTME-205

M.Code : 74981

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) Discuss the possible causes and remedies of incomplete fusion, porosity, spatter and under cutting in electrical arc welding.

   b) What is weld thermal cycle? Discuss in detail the metallurgy of fusion welds and the solidification mechanism of weld metal.

2. a) Discuss the effects of any four important alloying elements on the welding characteristics of ferrous metals.

   b) Compare the characteristics and performance of the various shielding gases that are used in arc welding.

3. a) What is a welding flux? List down the various ingredients of welding flux and discuss their role in the arc welding process.

   b) Discuss the phase transformations taking place during the cooling of weld metal in low alloy steels. What are the possible effects of these transformations on the properties of the joint?

4. a) Describe the principle, operation and process capabilities of submerged arc welding process.

   b) Which types of lasers are suitable for laser beam welding process? Give the limitations and applications of this process.

5. Explain the principle and working of GMAW process with the help of a neat sketch. Discuss in detail the mechanism and modes of metal transfer in GMAW process. What is the effect of polarity on metal transfer and melting rate of this process?

6. a) What is resistance welding? List down the various resistance welding processes and explain any one of them in detail.

   b) What equipment is required for Atomic hydrogen welding? Explain the power source, gas supply, torch, electrodes and filler rods.

7. a) Explain the TIG system of arc welding. Describe the features of the power supply used in TIG welding and give the applications of this process.

   b) Compare and contrast brazing, braze welding and soldering from the view point of temperature, joint strength and applications.

8. Write short notes on :

   a) Electrode coatings

   b) Friction stir welding

   c) Thyristor controlled rectifiers

   d) Microwave 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.