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(2126)

16313(D)

- 0 DEC 2016

M. Tech 1st Semester Examination

Welding Technology

PE-104

2

16313

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : (i) Attempt any five questions.
(ii) All questions carry equal marks.

1. What do you mean by welding arc? Discuss structure and characteristics in detail. Find the arc efficiency for GTAW process if the welding current is 150 Amperes and the arc voltage 20 volts. Assume a cathode drop of 8 volts anode drop of 3 volts with 30% of the arc column energy being transferred to the anode. Take arc temperature 15000K, Work function ϕ_0 for tungsten=4.5 eV and Boltzmann' constant= 8.62×10^{-5} eV/K.
(20)
2. What do you mean by weldability? State the difference between Autogenous and heterogenous welding. Discuss the factors affecting the weldability of metal. Describe in detail the weldability test related to reheat cracking. List some applications of advance welding techniques in manufacturing industry. (20)
3. What are the advantages and disadvantages of welding process over other joining processes? Determine the melting efficiency in case of arc welding of steel with a potential of 22V and current of 230A. The cross sectional area of the joint is 25mm² and the travel speed is 6 mm/s. Heat required to melt steel may be taken as 10J/mm² and heat transfer efficiency as 86 percent.
(20)

4. What are the requirements of an electric arc welding power source? Describe in brief the AC welding power source with help of suitable sketches. (20)
5. Discuss the parameters affecting the mode of metal transfer. Describe the role of metal transfer on weldment characteristics like bead geometry, penetration and metallurgical structure. (20)
6. What is the role of electrode coating? Describe the classification and coding of coated electrodes for SMAW of low alloy steel. (20)
7. Describe with the help of labeled diagram constructional features and working of Electron Beam Welding process. State the advantages, disadvantages and applications of the process. (20)
8. How the Gas Tungsten Arc Welding and Gas Metal Arc Welding differentiated from each other on the basis of process parameters, equipment used and application. Why thinner wire are more suitable for dynamic stability of GMAW process? (20)