

Total No. of Questions—12]

[Total No. of Printed Pages—4+1

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S.E. (Prod.) (II Sem.) EXAMINATION, 2010

WELDING AND FOUNDRY

(2008 COURSE)

Time : Three Hours

Maximum Marks : 100

- N.B. :- (i) Answer any *three* questions from each Section.
(ii) Answers to the two Sections should be written in separate answer-books.
(iii) Neat diagrams must be drawn wherever necessary.
(iv) Figures to the right indicate full marks.
(v) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
(vi) Assume suitable data, if necessary.

SECTION I

Unit I

1. (a) Explain self-adjusted and self-controlled arc method to maintain arc length constant in metal inert gas (MIG) arc welding process. [4]
(b) What is meant by plasma arc welding ? Explain non-transferred and transferred arc process in plasma arc welding. [8]
(c) Explain with suitable sketch Heat Affected Zone (HAZ) related with arc welding. [6]

P.T.O.

Or

2. (a) Discuss the function of coating on electrodes for Arc Welding. [4]
- (b) Describe with neat sketch Submerged Arc Welding (SAW) process, principle and its applications. [8]
- (c) The arc length-voltage characteristic of a d.c. is given by the equation $V = 24 + 4L$, where V is the arc voltage and L is the arc length in mm. The static volt-ampere characteristic of the power source is approximated by a straight line with no load voltage of 80 volts and short-circuit current of 600 amperes. Determine the optimum arc length for maximum power. [6]

Unit II

3. (a) Describe the process of Oxy-fuel gas cutting. What do you understand by the term kerf and drag in gas cutting ? [6]
- (b) Describe with neat sketch projection welding process along with advantages, disadvantages and applications. [6]
- (c) Distinguish with suitable sketches the different types of oxyacetylene gas flames. [4]

Or

4. (a) Compare leftwards and rightwards gas welding technique with neat sketch. [6]

- (b) Explain with neat sketch spot welding along with advantages, disadvantages and applications. [6]
- (c) List out various filler metals and fluxes used in gas welding. [4]

Unit III

5. (a) Explain with neat sketch thermit welding along with advantages, disadvantages and applications. [8]
- (b) Compare electron beam welding with laser beam welding. [4]
- (c) Write a short note on calculation of welding cost. [4]

Or

6. (a) Compare soldering and brazing. What are the functions of fluxes and filler metal used in both? [6]
- (b) Explain ultrasonic welding with its advantages, disadvantages and applications. [6]
- (c) Write short note on Inspection and Testing of weld. [4]

SECTION II

Unit IV

7. (a) Explain with neat sketch different types of patterns. List out various pattern materials. [8]
- (b) List out various tests performed on moulding sand. Write the procedure for permeability test of moulding sand. [8]

Or

8. (a) With neat sketch explain the construction and operation of a Cupola furnace. [10]
- (b) Explain in detail various allowances given to the patterns. [6]

Unit V

9. (a) Explain with neat sketch pressure die casting process. List out merits, demerits and applications of it. [8]
- (b) Write short notes on : [8]
- (i) Foundry Mechanisation
- (ii) Investment Casting.

Or

10. (a) What are the common defects in the casting ? State their causes and remedies. [8]
- (b) Differentiate between Hot Chamber and Cold Chamber die casting. [4]
- (c) Explain with neat sketch True centrifugal casting process. [4]

Unit VI

11. (a) What is meant by directional and progressive solidification of casting ? Explain this with neat sketch. [6]

- (b) Using Caine's method, calculate the size of cylindrical riser (Height = Diameter) necessary to feed steel slab casting $50 \times 50 \times 10$ cm with side riser, casting is poured horizontally into the mould.

Data for steel casting $a = 0.1$, $b = 0.03$ and $c = 1.0$. [8]

- (c) Explain Chvorinov's rule. [4]

Or

12. (a) Define gating ratio. Explain pressurized and unpressurized gating system. State the standard gating ratios used in practice for Aluminium, Steel and Brass. [8]
- (b) Explain the following : [10]
- (i) Casting yield and methods to increase it.
- (ii) Various components of gating system and their functions.