ME-704B

ADVANCED WELDING TECHNOLOGY

Time Allotted: 3 Hours | Full Marks: 70

The questions are of equal value.
The figures in the margin indicate full marks
Candidates are required to give their answers in their own words as far as practicable.

GROUP A
(Multiple Choice Type Questions)

1. Answer any *ten* questions. 10×1 = 10

(i) Flux is a chemical compound used to prevent the :

(A) metal from becoming overheated
(B) welding rod from freezing to the metal
(C) formation of carbon on the metal
(D) formation of an oxide on the metal

(ii) Straight polarity is when:

(A) work is positive and the electrode is negative
(B) both the work and the electrode are positive
(C) the work is negative and the electrode is positive
(D) both the work and the electrode are negative

(iii) What is the work angle?

(A) the angle between the electrode and the base metal when viewed from the end plane
(B) the angle between the electrode and the vertical plane when viewed from the side
(C) the position of the base metal being welded
(D) the angle between the base metal and the welding table

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(iv) The two methods of striking an arc are:

(A) scratching and itching
(B) digging and scratching
(C) rubbing and scratching
(D) scratching and tapping

(v) What does the abbreviation GMAW stand for?

(A) General Machining And Welding
(B) Gas Motion Arc Welding
(C) Gas Metal Arc Welding
(D) General Metal Arc Welding

(vi) The AC/DC welding machine is essentially an AC welder with an electronic device to convert AC to DC power. This electronic device is called as-

(A) amplifier
(B) rectifier
(C) justifier
(D) generator

(vii) In the shielded metal arc welding process, impurities are floated out of the molten puddle to form a deposit known as _____ that protects the weld as it cools.

(A) slag
(B) flux
(C) dross
(D) flack

(viii) Constant current characteristics curve is called

(A) drooping curve
(B) gaping curve
(C) none of these
(D) both (A) and (B)

(ix) Under water welding is done by

(A) wet welding technique
(B) dry welding technique
(C) both (A) and (B)
(D) none of these

(x) Arc blow is caused by:

(A) electrical forces
(B) magnetic forces
(C) metallic forces
(D) magical forces

(xi) Beveling is often used on very _____ metals.

(A) thick
(B) thin
(C) wide area
(D) small volume

(xii) If the electrode is moved too fast when arc welding:

(A) wide bead will result
(B) not enough metal will be deposited
(C) excessive weld metal will be used
(D) the bead will be too high

GROUP B
(Short Answer Type Questions)

Answer any *three* questions. 3×5 = 15

2. What are the parameters to be controlled in the resistance welding?

3. List the advantage and disadvantage of gas welding.

4. Explain rightward and leftward welding techniques?

5. Explain shielded metal arc welding.

6. Explain
   i) welding automation
   ii) welding fixtures.

GROUP C
(Long Answer Type Questions)

Answer any *three* questions. 3×15 = 45

7. Discuss in details following non destructive testing of welds 15
   (a) Visual inspection,
   (b) Radiography test,
   (c) Liquid dye penetration test,
   (d) Ultrasonic testing,
   (e) Eddy current testing.

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8. (a) Discuss in details problem encountered in underwater welding. What is its characteristic of good under water welding process? Write its application. 8+3+4
   (b) Explain HAZ with a neat figure.
   (c) What is friction stir welding? Where it is used.

9. (a) Describe Principle of operation of EBW (Electron beam welding). What are the possible Problem or difficulties and how it can be dealt with? Write down the advantage and limitation. 8+4+3
   (b) What is the principle behind the generation of Laser? Describe Laser beam welding.
   (c) What is ultrasonic welding? How ultrasonic waves is generated.

10. (a) Discuss the welding of cast iron. 6+5+4
    (b) Explain the effect of recrystallization and grain structure on weld properties.
    (c) Discuss the soldering and brazing process. Show neat diagrams.

11. Write short notes on any five of the following: 5×3
    (a) Plasma arc welding
    (b) Cold welding
    (c) Underwater welding
    (d) Friction welding
    (e) Laser beam welding
    (f) Welding robots
    (g) HAZ.

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