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**QUESTION PAPER FOR WRITTEN EXAMINATION FOR POST OF
INSTRUCTOR (MECHANICAL) [EX.CADRE]
[GRADE PAY (GP) Rs.4200/- (VI PC) / Level 6 (VII PC)] FOR
ADVANCED WELDING TRAINING INSTITUTE (AWTI), ICF**

Date of Examination: 02/06/17

**Duration: 3 Hours
Maximum Marks: 100**

Instructions to Candidate:

1. The Question Paper consists of Section 'A' and Section 'B'
2. Section 'A' consists of 25 Objective Type Questions which are compulsory. Each Objective Type Question carries 2 Marks. There is no Negative Mark for Wrong Answer to Objective Type Question. The Objective Type Questions have to be answered in Answer Sheet.
3. Section 'B' contains Descriptive Type Questions. Each Question in Section 'B' carries 10 Marks. Any 5 Questions have to be attempted from Section 'B'. The Marks are indicated against each Question.
4. The Candidate is instructed not to leave any identification Mark/Sign in the Answer Booklet which may reveal his/her identity. Any distinguishing Mark(s) made by the Candidate on the Answer Booklet will render the Answer Booklet invalid for evaluation.

Section 'A'

(25 x 2 Marks = 50 Marks)

1. The main criterion for selection of Electrode Diameter in Arc Welding is:
 - (a) Material to be welded
 - (b) Type of Welding Process
 - (c) Thickness of Material
 - (d) Voltage used
 - (e) Current used
2. The following Gases are used in Tungsten Inert Gas (TIG) Welding:
 - (a) Hydrogen and Oxygen
 - (b) CO₂ and H₂
 - (c) Argon and Neon
 - (d) Helium and Neon
 - (e) Argon and Helium
3. 'Magnetic Arc Blow' is
 - (a) A recent Welding Technique
 - (b) Used to weld Hard Materials
 - (c) Occurs when Welding near Equator
 - (d) Of importance during striking of Arc

57/c
279/c

(e) Phenomenon of occurrence of spatter because of Magnetic Fields created during 'DC Arc Welding'

4. In 'Reverse Polarity' Welding

- (a) Electrode Holder is connected to Negative and Work to Positive
- (b) Electrode Holder is connected to Positive and Work to Negative
- (c) Work is Positive and Holder is earthed
- (d) Holder is Positive and Work is earthed
- (e) Work is negative and Holder is earthed

5. The Amperage to be used in 'Arc Welding' is dependent upon

- (a) Work Thickness
- (b) Arc Gap
- (c) Electrode Rod Thickness
- (d) Other considerations
- (e) None of the above

6. Oxygen to Acetylene Ratio in case of 'Neutral Flame' is

- (a) 0.8:1.0
- (b) 1:1
- (c) 1.2:1
- (d) 2:1
- (e) None of the above

7. In MIG Welding, Helium or Argon Gas is used in order to:

- (a) Provide cooling effect
- (b) Act as Flux
- (c) Act as Shielding Medium
- (d) Facilitate Welding Process
- (e) Protect Electrode

8. 'Weld Spatter' refers to

- (a) Welding Electrode
- (b) Flux
- (c) Filler Material
- (d) Welding Defect
- (e) Shield

9. The Acetylene Cylinder is filled with Material saturated with

- (a) Calcium Carbide
- (b) Calcium Oxide
- (c) Black Carbon
- (d) Acetone
- (e) Acetylene

27/11/10
5610

10. The first dimension appearing to the immediate right of the Weld Symbol generally refers to:
- (a) Weld reinforcement
 - (b) Root opening
 - (c) Pitch Distance
 - (d) Weld Length
 - (e) None of the above
11. Low Hydrogen Electrodes are baked prior to use in order that:
- (a) Proper strength is obtained
 - (b) Welding is free from 'Arc Blow'
 - (c) Welding is free from 'Moisture Pick-up'
 - (d) Current required is minimum
 - (e) Electrode does not crumble during use
12. Carburizing Flame has
- (a) 1 Zone
 - (b) 2 Zones
 - (c) 3 Zones
 - (d) 4 Zones
 - (e) No Zone
13. Oxygen-Acetylene Flame cuts Metal by its:
- (a) Evaporation
 - (b) Burning
 - (c) Rusting
 - (d) Intensive Oxidation
14. Flux is used in Welding in order to protect the Molten Metal and the surfaces to be joined from:
- (a) Oxidation
 - (b) Carburising
 - (c) Dirt
 - (d) Distortion and Warping
 - (e) Unequal Temperature Distribution
15. The strength of a properly Welded Joint as compared to Base Metal would be
- (a) Same
 - (b) More
 - (c) Less
 - (d) Unpredictable
 - (e) Two cannot be compared

270/c
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16. 'Arc Length' in Arc Welding should be nearly equal to:
- (a) Diameter of Electrode (d)
 - (b) 1.5d
 - (c) 2d
 - (d) 3d
 - (e) 4d
17. Silicon is added to Electrode Coating as
- (a) Coloring Agent
 - (b) Slag Former
 - (c) De-oxidant
 - (d) None of above
18. Which of the following types of Metal Transfer in GMAW provides the lowest amount of Heat to the Workpiece and, therefore, prone to incomplete Fusion:
- (a) Short Circuiting
 - (b) Spray
 - (c) Globular
 - (d) Droplet
 - (e) Pulsed Arc
19. In Arc Welding, Arc is created between the Electrode and Work by
- (a) Flow of current
 - (b) Voltage
 - (c) Material Characteristics
 - (d) Contact Resistance
20. 'Open Circuit Voltage (OCV)' for Arc Welding is of the order of
- (a) 18 - 40 Volts
 - (b) 40 - 95 Volts
 - (c) 100 - 125 Volts
 - (d) 130 - 170 Volts
 - (e) 190 - 240 Volts
21. Electrode gets consumed in the following 'Welding Process'
- (a) Gas
 - (b) Resistance
 - (c) Thermit
 - (d) Arc
 - (e) TIG
22. Which of the following Processes joins Metals plastically?
- (a) Friction Welding
 - (b) Resistance Welding
 - (c) Plasma Welding
 - (d) All of the above

54/c
269/c

23. 'Percentage Elongation' of Metal undergoing 'Tensile Test' is a measure of :
- (a) Elasticity
 - (b) Plasticity
 - (c) Ductility
 - (d) Malleability
24. Pre-heating Carbon Steel in 'Manual Metal Arc Welding (MMAW)' is carried out to minimize the risk of:
- (a) Scattered Porosity
 - (b) Worm Hole Porosity
 - (c) Parent Metal cracking
 - (d) Lack of Penetration
25. Which type of Electrode Coating gives the most voluminous Gas Shield?
- (a) Rutile
 - (b) Basic
 - (c) Oxidising
 - (d) Cellulosic

53/c
26/c

Section 'B'

1. (a) Describe principle of Gas Metal Arc Welding (GMAW) with neat sketch indicating Equipment used. (5 Marks)
(b) Describe various Destructive and Non-Destructive Tests for Testing Welds. (5 Marks)

2. (a) Draw 'Welding Symbol' for the following Welding Joints: (5 Marks)
 - (i) Single-Bevel Butt Weld with Broad Root Face
 - (ii) Single 'V' Butt Weld
 - (iii) Backing Run
 - (iv) Spot Weld
 - (v) Plug Weld(b) What are different Types of 'Welding Defects'? Indicate the causes and remedies for them. (5 Marks)

3. (a) Describe the salient provisions of Official Language Act, 1963. (5 Marks)
(b) Which are the three Regions as per provisions made in the Official Languages Rules, 1976? Details of States covered may also be indicated. (5 Marks)

4. (a) Describe 'Forehand Welding Method (Left-ward Technique)' and 'Backhand Welding Method (Right-ward Technique)' for 'Gas Welding' with neat Sketch. (5 Marks)
(b) What do you understand by 'Arc Blow'? (5 Marks)

5. (a) Explain the modes of Metal Transfer in 'Arc Welding' (5 Marks)
(b) What are Safety Precautions to be followed in Welding? (5 Marks)

6. Write Short Notes on the following: (10 Marks)
 - (a) MIG Welding
 - (b) Welding Jigs and Fixtures
 - (c) Principles of Flame Cutting
 - (d) Spot Welding
 - (e) Welding Procedure Specification (WPS)