

SPECIMEN WRITTEN EXAMINATION QUESTIONS

CSWIP 3.1

1.1 Part A and Part A2

Candidates are required to tick, or otherwise indicate, the corrective answer in the section provided. There is only one correct answer for each question.

1 Applying preheat when welding carbon manganese steel is normally done to avoid:

- a) Slag inclusions
- b) Hydrogen cracking
- c) Lack of sidewall fusion
- d) Porosity

2 Which of following mechanical properties of a weld in carbon manganese steel is most affected if the heat input per unit length of weld is excessively high?

- a) Elongation
- b) Tensile strength
- c) Hardness
- d) Toughness

3 You observe centerline cracking on a weld that has been made at one of five work stations each making similar components. The first action to take is:

- a) Impound all welding consumables
- b) Report the occurrence to high authority
- c) Stop all welding
- d) Call for full NDT checks.

4 Which of the following defects is unlikely to be found by visual inspection.

- a) Linear misalignment
- b) Undercut
- c) Overlap
- d) Linear slag inclusion

5 Which of the following welding processes uses a resistive heating system to achieve weld metal deposition.

- a) Manual metal arc welding
- b) Submerged-arc welding
- c) Electro slag welding
- d) Resistance spot welding

6 Which of the following units could Charpy V notch energy be measured?

- a) Pounds per square inch
- b) Joules
- c) Newton's per square millimeter
- d) None of the above

7 The usual method of assessing the sensitivity of radiograph is by means of a:

- a) Dosimeter
- b) Fluoroscope
- c) IQI (Penetrameter)
- d) Clinometers

8 Under normal contract conditions, weld procedure approval tests for pipe work are:

- a) Mandatory
- b) Depend upon site and weather conditions
- c) Dependent upon the contractor's confidence in his procedures
- d) Only required when CO₂ welding is to be used.

9 Which of the following destructive tests is not normally required for welder approval test for mild steel?

- a) Bend test
- b) Macro examination
- c) Impact tests
- d) Fracture tests

10 Hydrogen controlled electrodes were developed principally for:

- a) The prevention of porosity
- b) The prevention of cracking
- c) The enhancement of arc voltage
- d) Their ease of arc starting

11 For which of the following is pre-heating most likely to be required?

- a) Austenitic stainless steels
- b) High strength alloy steels
- c) Low and medium strength steels
- d) Low carbon steels

12 Manual metal arc welding of low alloy steels is more likely to be performed with:

- a) Rutile electrodes
- b) Cellulosic Electrodes
- c) Iron powder electrodes
- d) Basic hydrogen controlled electrodes

13 Which of the following defects is more common to weld deposited by the CO₂ welding process than weld deposited by manual metal arc?

- a) Slag inclusion
- b) Excess penetration
- c) Lack of side fusion
- d) Tungsten inclusions

14 Which defect would you expect to obtain in TIG welds in non-deoxidized steel?

- a) Under cut
- b) Porosity
- c) Tungsten inclusions
- d) Linear misalignment

15 Which of the following can arise from copper inclusions in a ferrite steel weld?

- a) Weld metal cracks
- b) HAZ cracks
- c) Lamellar tearing
- d) Porosity

16 Which of the following is likely to give the highest impact strength in ferrite weld metal?

- a) Cellulosic electrodes
- b) Submerged arc with acid flux
- c) Spray transfer CO₂-welding
- d) Basic coated normal metal arc electrodes

17 Which of the following methods of NDT would be most likely to detect lack of side fusion in ferritic steel welds?

- a) Penetrants
- b) Magnetic particles
- c) Radiography
- d) Ultrasonic flaw detector

18 You suspected that ferritic steel plates, which have been edge prepared, contain cracks in the prepared edges. Which NDT method would you use to check this?

- a) Radiography
- b) Magnetic particle
- c) Penetrants
- d) Ultrasonic flaw detector

19 Which of the following defects do you not expect to find by visual examination of completed welds?

- a) Linear slag inclusions
- b) Under cuts
- c) Overlap
- d) Linear misalignment

20 Stress relief is not helpful in one of the following cases. Which one?

- a) In improving resistance to stress corrosion cracking
- b) In dimensional stability after machining
- c) In lowering the peak residual stress
- d) In softening the steel

21 What is the maximum hardness usually recommended for the HAZ of a medium strength ferritic steel weld?

- a) 100 DP Hv
- b) 350 DP HV
- c) 500 DP Hv
- d) 750 DP Hv

22 What effect to mid-thickness lamination in steel plate normally have when they are located within a weld HAZ?

- a) Cause lamellar tearing
- b) Fuse together to form a bond
- c) Affect the weld metal composition
- d) Cause internal tearing on a micro-scale

23 When hydrogen control is specified for a manual metal arc-welding project the electrode would normally be:

- a) Cellulosic
- b) Iron oxide
- c) Acid
- d) Basic

24 You would with certainty recognize a hydrogen controlled flux covered electrode from its:

- a) Color
- b) Length
- c) Trade name
- d) AWS/BS639 Code Letter

25 When manual metal arc welding is being carried out on an open construction site, which groups of welder are most likely to require continuous monitoring?

- a) Concrete shuttering welding team
- b) Pipe welders
- c) Platter welders
- d) Plant maintenance welders

26 You noticed manual metal arc welding electrodes, stripe of flux, are being used as filler wire, for TIG welding. You would object because:

- a) It is too expensive

- b)The wire would be too thick
 - c)The weld metal composition may be wrong
 - d)The wire is too short
- 27-When open site working, serious porosity in manual metal arc welding is brought to your attention. What would you investigate?
- a)Electrode type
 - b)Power plant type
 - c)Electrode storage
 - d)Day temperature
- 28-The steel composition in structural contract is changed from 0.15% carbon, 0.6% manganese, to 0.2% carbon, 1.2% manganese. Might this influence the incidence of:
- a)Porosity
 - b)Cracking in the weld area
 - c)Under cut for fillet welds
 - d)Lack of root fusion defects
- 29-One of the following alloys is non-magnetic, Which?
- a)4.0% Chromium molybdenum
 - b)12.0% Chromium
 - c)Austenitic Stainless Steel
 - d)9.0% Nickel Steel
- 30-When the TIG welding Austenitic Stainless Steel pipe. Argon gas backing is called for. This is to:
- a)Prevent oxidation
 - b)Prevent under bead cracking
 - c)Prevent porosity
 - d)Control the penetration bead shape
- 31-Pre-heating a carbon steel manual metal arc welding is carried out to minimize the risk of
- a)Scattered porosity
 - b)Worm hole porosity
 - c)Parent metal cracking
 - d)Lack of penetration
- 32-IN UK practice, BS 499 Part2 specifies that the drawing dimension quoted for a fillet weld is the:
- a)Leg length
 - b)Actual throat thickness
 - c)Weld width
- 33-For open site manual metal arc welding the following equipment is available. Which would you choose for safe working?
- a)Single operator transformer
 - b)Multi operator transformers
 - c)AC/DC composite power unit
 - d)Diesel engine driven motor generator
- 34-If submerged welding to be used to make butt welds, which would you be most critical of:
- a)The root gap tolerance
 - b)The angle of penetration
 - c)The root face width
 - d)The gas cut finish
- 35-During CO₂ welding, the arc length is most likely to be affected by:
- a)The wire diameter
 - b)The current return connections
 - c)The gas flow rate
 - d)The torch to work angle
- 36-Pre heating for arc welding applies to:
- a)Assembly welding only
 - b)Assembly and tack welding
 - c)Joint over 25 mm thick only
 - d)Cruciform welds only
- 36-You see a welder using oxy-acetylene flame with a long feathered inner cone. What would be the effect of this on carbon steel?
- a)The weld could be hard and brittle
 - b)The weld metal could be too soft
 - c)There will be no effect on the weld
 - d)The weld has under cut
- 37-A welder qualification test is to verify:
- a)The skill of the welder
 - b)The quality of the materials
 - c)The non-destructive procedures
 - d)The manufacturing methods
- 38-A fabricating procedure calls for fillet welds to be blended in by grinding. This is to influence:
- a)HAZ cracking
 - b)Fatigue life
 - c)Residual stresses
 - d)Yield strength
- 39-Bend test specimens have been taken from a 25 mm thick carbon steel butt weld. Which would show lack of inter-run fusion:
- a)Side bend

- b)Root bend
 - c)Face bend
 - d)Guided bend
- 40-Lamellar tearing has been occurred in steel fabrication. BEFORE welding could it have been found by:
- a)X-ray examination
 - b)Dye penetrant
 - c)Ultrasonic inspection
 - d) It would not have been found by any inspection method
- 41-You are to over see arc welding of some machine fittings and find they are cadmium plated. What you:
- a)Permit it to proceed
 - b)Permit it to proceed with fume extraction
 - c)Stop the operation at once
 - d)Advise the welder to drink milk and proceed
- 42-What two functions in arc welding must be in equilibrium to enable a stable arc to be established?
- a)Arc voltage
 - b)Current
 - c)Wire/electrode feed rate
 - d)Metal burn-off rate
- 43-In MMA welding, what parameter is used for the control penetration into the base material?
- a)Voltage
 - b)Welding speed
 - c)Iron powders in the coating
 - d)Current
- 44-In the welding of butt joint from one side, which of the following controls the profile of the root bead?
- a)Root Face
 - b)Bevel Angle
 - c)Root Gap
 - d)One of the above
- 45-What type of power source characteristic is required for manual welding?
- a)Constant voltage
 - b)Flat Characteristic
 - c)Drooping Characteristic
 - d)Motor Generator
- 46-Which of the following destructive tests would indicate the toughness of weld metal/parent metal – HAZ.
- a)Macro
 - b)Nick break
 - c)Hardness
 - d)Charpy vee notch
- 47-Degreasing components are essential for quality welding but some agents may:
- a)Cause corrosion Problems
 - b)Give off Phosgene Gas
 - c)Leave Residues
 - d)All of the Above
- 48-Which of the following chemical elements has the greater effect on the harden ability of a steel plate?
- a)Molybdenum
 - b)Chromium
 - c)Titanium
 - d)Carbon
- 49-In MAG/CO2 welding, which parameters give the greatest control of weld appearance during dip transfers or short-circuiting welding?
- a)Wire sick-out length
 - b)Amperage
 - c)Wire feed speed
 - d)Inductance
- 50-In MMA welding, the slag produced can be varied to suit the welding position; which type of slag would be required for welding in the HV position?
- a)Fluid
 - b)Viscous
 - c)None of the above
 - d)Semi fluid
- 51-The weld metal deposits of manual metal arc electrode achieves its mechanical strength through?
- a)The core wire
 - b)The flux coating
 - c)Iron powder with the flux coating
- 52-What constituent is needed in coating of electrode of an electrode to prevent formation of porosity in welding of rimming steel?
- a)Iron powder
 - b)Calcium fluoride
 - c)Silicon
 - d)Calcium carbonate
- 53-Welds made with high heat inputs show a reduction in one of the following properties?

- a) Ductility
 - b) Toughness
 - c) Fatigue strength
 - d) Mechanical strength
- 54- In the welding of Austenitic pipe work, the borer is usually purged with Ar to?
- a) Prevent formation of porosity in the weld
 - b) Prevent burn-through in the root run
 - c) Prevent oxidation of the root bead
 - d) Eliminate the formation of H₂
- 55- In X-ray the quality of the radiograph negative is assessed by the?
- a) Density of the Film
 - b) IQI indicator
 - c) KVA available
 - d) Stand-off distance
- 56- A steel described, as QT will have improved tensile properties it has?
- a) Had control of chemical composition
 - b) Been heat treated
 - c) Been quality tested
 - d) Been vacuum melted
- 57- Which one of the following steels would give rise to the formation of porosity when autogenously welded with an arc process?
- a) Fully killed steel
 - b) Semi killed steel
 - c) Rimming steel
 - d) Fine grained steel
- 58- In submerged arc welding, the use of excessively high voltage would result in?
- a) Insufficient flux melting
 - b) Excessive flux melting
 - c) Slag removal difficulties
 - d) Spatter
- 59- The use of cellulosic electrode is often made when welding the root pass of pipes in the field. This is because?
- a) Hydrogen control is needed
 - b) Iron powder in the electrode
 - c) Higher arc voltage can be obtained
 - d) Shorter arc length can be achieved
- 60- In the welding of Austenitic stainless steels, the electrode and plate material can be purchased with low carbon contents. The reason for this is to prevent?
- a) Cracking in the HAZ
 - b) The formation of chromium carbides
 - c) Cracking in the weld metal
 - d) Distortion
- 61- Submerged arc fluxes can be supplied in two forms; these are?
- a) Sintered and agitated
 - b) Agitated and fused
 - c) Crushed and agglomerated
 - d) Fused and agglomerated
- 62- In a steel, which has improved creep properties at elevated temperature, which one of the following elements helps in this improvement?
- a) Tungsten
 - b) Manganese
 - c) Molybdenum
 - d) Carbon
- 63- Welding a steel plate of CE of 0.45 would require preheating to?
- a) Prevent the formation of sulphides
 - b) Prevent hardening in the HAZ
 - c) Prevent the formation of carbides
 - d) To improve mechanical properties in the weld
- 64- Which of the following processes uses the "keyholing" system of fusion?
- a) Friction welding
 - b) Diffusion bonding
 - c) Electron beam welding
 - d) Autogenous TIG welding
- 65- In friction welding, is the metal at the interface in the?
- a) Liquid state
 - b) Solid state
 - c) Plastic state
 - d) Elastic state
- 66- Welding procedures may require welds to be deposited at a controlled rate heat input. High heat inputs would?
- a) Have poor profile
 - b) Have larger grain size
 - c) Have high hardness in the HAZ
 - d) Have low elongation properties

- 67-In a tensile test, a brittle material would be indicated if the fracture surface?
- Shows reduction in size
 - Is flat and featureless
 - Breaks in the weld metal
 - Breaks in the parent material
- 68-What destructive test would be required to ascertain the likelihood of cracking in the HAZ of a weld?
- Nick break
 - Side bend test
 - Charpy input
 - Macro test
- 69-In submerged arc welding, excessive arc voltage may cause?
- Excessive penetration
 - Change in weld metal composition
 - Narrow weld width
 - Excessive bead profile
- 70-The British code for visual inspection requirements is:
- BS4872
 - BS499
 - BS4870
 - None of the above
- 71-A code of practice for visual inspection should cover the following:
- Before, during and after welding activities
 - Before welding activities only
 - After welding activities only
 - None of the above
- 72-Incomplete penetration in a butt joint could be caused by:
- Excessive root face width
 - Excessive root gap size
 - Low current setting
 - Both A & C
- 73-Incomplete root fusion weld certainly be caused by:
- Linear misalignment
 - Incorrect tilt angle
 - Differing root face widths
 - All of the above
- 74-When visually inspecting a completed single vee butt weld cap you would certainly assess:
- Cap height
 - Toe blend
 - Weld width
 - A, B & C
- 75-You notice a very “veed” ripple shape. This is most likely caused by:
- Poor consumable choice
 - Welding position
 - Excessive travel speed
 - All of the above
- 76-“Toe blending” is important as it may affect:
- Corrosion
 - Fatigue life
 - Overlap type defects
 - All of the above
- 77-Slag inclusion would occur with:
- Manual metal arc
 - Metal inert gas
 - Submerged arc welding
 - Both A & C
- 78-Undercut principally caused by:
- Excessive amps
 - Excessive volts
 - Excessive travel speed
 - All of the above
- 79-Undercut normally assessed by:
- Its depth
 - Its length
 - Its blending
 - All of the above
- 80-A welding procedure is useful to:
- Give information to the welder
 - Give information to the inspector
 - Give “Confidence” to a product
 - All of the above
- 81-An essential variable may:

- a) Change the properties of the weld
- b) Influence the visual acceptability
- c) Require re-approval of a weld procedure
- d) All of the above

82-A magnifying glass may be used during visual inspection but BS 5289 states that its magnification should be:

- a) Up to 5 ϕ
- b) 2 – 2.5 ϕ
- c) 5 – 10 ϕ
- d) None of the above

82-When visually inspecting a fillet weld, it would normally be “sized” by:

- a) The leg lengths
- b) The actual throat thickness
- c) The design throat thickness
- d) Both A & C

83-The planar defect is:

- a) Incomplete fusion defects
- b) Slag inclusion
- c) Incomplete penetration
- d) Both A & C

84-Penetrant and Magnetic particle inspection are mainly used to:

- a) Aid visual inspection
- b) Because application standard says so
- c) To confirm “visual uncertainties”
- d) All of the above

85-Defects outside of the limits specified in a standard should always be:

- a) Repaired
- b) Reported to “a senior person”
- c) Assessed along with other defects
- d) All of the above

86-MIG welding tends to be susceptible to lack of fusion problems. This is because of:

- a) Poor maintenance of equipment
- b) Incorrect setting
- c) Poor inter run cleaning
- d) All of the above

87-Manual metal arc electrodes can be grouped into three main types. These are:

- a) Basic cellulosic and rutile
- b) Neutral cellulosic and rutile
- c) Basic cellulosic and neutral
- d) None of the above

88-The main causes of porosity in welded joints are:

- a) Poor access
- b) Loss of gas shield
- c) “Dirty” materials
- d) All of the above

89-“Weave technique” may give rise to:

- a) Better profiles
- b) Improved toe blending
- c) Improved ripple shape
- d) All of the above

90-Cracks in welds may be due to:

- a) Solidification problems
- b) Hydrogen problems
- c) Excessive stresses
- d) All of the above

91-With reference to a root penetration bead, you could certainly assess:

- a) Root fusion and penetration
- b) Root concavity
- c) Burn-through
- d) All of the above

92-A fatigue failure characteristic by the appearance of the fracture surface. It would be:

- a) Rough and torn
- b) “Chevron” – like
- c) Smooth
- d) None of the above

93-“Stray arcing” may be regarded as a serious defect. This is because:

- a) It may reduce the thickness dimension of a component
- b) It may cause liquation cracks
- c) It may cause hard zones
- d) All of the above

94-Overlap in welds could be influenced by:

- a) Poor welding technique

- b)Welding process
 - c)Welding position
 - d)All of the above
- 95-Flame cut preparations may, during welding, increase the likelihood of:
- a)Cracking
 - b)Misalignment problems
 - c) Inclusions
 - d)All of the above
- 96-Macroscopic examination requires any specimen to be inspected:
- a)Once, after etching
 - b)Twice, before and after etching
 - c)Using a microscope
 - d)None of the above
- 97-Which of the following may be classes as a “more serious defect”:
- a)Slag inclusions
 - b)Fusion defects (inter run)
 - c)Fusion defects (surface)
- 98-Code of practice is:
- a)A standard for workmanship only
 - b)A set of rules for manufacturing a specific product
 - c)Levels of acceptability of a weldment
 - d)None of the above
- 99-Movement of the arc by magnetic forces in-MMA welding is termed:
- a)Arc deviation
 - b)Arc misalignment
 - c)Arc blow
 - d)Arc eye
- 100-A metallurgical problem most associated with submerged arc welding is:
- a)Hydrogen cracking in HAZ
 - b)Solidification cracking in the weld metal
 - c)Hydrogen cracking in the weld metal
 - d)Lamellar tearing in the weld metal
- 101-Oxy pressure and nozzle size would influence what in flame cutting:
- a)The temperature required for cut initiation
 - b)The ability to cut stainless steels
 - c)The depth of cut obtainable
 - d)None of the above
- 102-The main uses of arc cutting/gouging processes is in:
- a)The cutting of single bevel preparations
 - b)The removal of deposited welds
 - c)The cutting of single U-type preparations
- 103-Which of the following processes joins metals plastically:
- a)Friction welding
 - b)Resistance welding
 - c)Plasma welding
 - d)All of the above
- 104-Which electrode classification would be relevant AWS A 5.1-81:
- a)E 6013
 - b)E 5133
 - c)E 7018 – G
 - d)Fleet weld 5
- 105-Which of the following coating is associated with “Stove” welding;
- a)Rutile
 - b)Cellulosic
 - c)Basic
 - d)Oxidizing
- 106-A common gas mixture used in MIG welding nickel alloys to combine good levels of penetration with good arc stability would be:
- a)100% CO₂
 - b)100% argon
 - c)80% argon 20% CO₂
 - d)98% argon 2% oxygen
- 107-The type of SAW flux is more resistance to moisture absorption:
- a)Fused
 - b)Agglomerated
 - c)Basic
 - d)All of about the same resistance
- 108-The flame temperature of oxy/acetylene mixture gas is given as:
- a)3200°C
 - b)2300°C
 - c)5000°C

- d)None of the above
- 109-A large grain structure in steels is said to produce:
- a)Low ductility values
 - b)Low fracture toughness values
 - c)High fracture toughness values
 - d)High tensile strength
- 110-The likelihood of brittle fracture in steels will increase with:
- a)A large grain formation
 - b)A reduction of in service temperature to sub zero levels
 - c)Ferritic rather than austenitic steels
 - d)All of the above
- 111-Repair welding is often more difficult than production due to:
- a)The material being ingrained with in-service contaminants
 - b)Restricted access with the repair area
 - c)The possible position of the weld
 - d)Any of the above
- 112-Hydrogen cracking in the weld metal is likely when:
- a)Carbon manganese steels
 - b)Stainless steels
 - c)Micro alloyed steels (HSLA)
 - d)Low carbon steels
- 113-EN standard 288 would refer to which of the following:
- a)Welder approval testing
 - b)Welding equipment
 - c)Welding procedure approval
 - d)Consumables for submerged arc welding
- 114-Porosity is caused by:
- a)Entrapped slag in the solidifying weld
 - b)Entrapped gas in the solidifying weld
 - c)Entrapped metallic inclusions in the solidifying weld
 - d)None of the above
- 115-In bend test, the face of the specimen is in tension and root is in compression; the type of test being carried out would be:
- a)A root bend test
 - b)A side bend test
 - c)A face bend test
 - d)None of the above
- 116-Ultrasonic testing is of advantage in detecting which of the following weld imperfections over other NDT methods:
- a)Lack of side wall fusion
 - b)Surface undercut
 - c>Incompletely filled groove
 - d)Overlap
- 117-The process of tempering is often carried out to regain toughness after which of the following processes:
- a)Annealing
 - b)Normalizing
 - c)Hardening
 - d)Stress relieving
- 118-The presence of iron sulphide in the weld metal is most likely to produce which of the following upon contraction of the weld:
- a)Solidification cracking
 - b)Hydrogen cracking
 - c)Inter granular corrosion
 - d)Stress corrosion cracking
- 119-Generally the most suitable method of detecting lack of sidewall fusion would be:
- a)Ultrasonic
 - b)MPI
 - c>Radiography
 - d)Penetrants
- 120-Hot shortness term is used to indicate:
- a)Lamellar tearing
 - b)Solidification cracking
 - c)Hydrogen cracking
 - d)None of the above
- 121-The use of cobalt as an isotope would generally be used on:
- a)Thin materials
 - b)Tee joints
 - c)Plate thickness greater than 25mm
 - d)None of the above
- 122-In welding procedure term, a change in essential variable means
- a)Re-qualification of the welding procedure
 - b)Possible change in the weld's microstructure
 - c)Possible change in the mechanical properties
 - d)All of the above

123-Weld symbol placed on a dotted line in accordance with ISO requirements means:

- a) Weld on "arrow" side
- b) Weld on "other" side
- c) Weld on site
- d) Full penetration required

124-A welding inspector's main attribute includes:

- a) Knowledge and experience
- b) Literacy
- c) Honesty and integrity
- d) All of the above

125-The correct term for a joint prepared on one component only is:

- a) A bevel butt
- b) A J butt
- c) A "K" butt
- d) All of the above

126-Technically a code of practice is:

- a) A standard
- b) A "set of rules" for the manufacture of a product
- c) Related to welder and weld procedure approval
- d) All of the above

127-The correct term for cap height is:

- a) Reinforcement
- b) Cap profile height
- c) Excessive weld metal
- d) All of the above

128-A tensile test will assess

- a) Impact values
- b) Stress
- c) Strain
- d) Both a) & c

129-The important point of high temperature steel is that:

- a) They can withstand creep failure
- b) They may suffer re-heat cracking problems
- c) They may suffer loss of toughness
- d) All of the above

130-An austenitic stainless steel may suffer:

- a) Weld decay
- b) Sensitization
- c) Solidification cracking
- d) All of the above

131-Carbon equivalent values are useful to determine:

- a) Weld ability aspects
- b) Crack sensitivity aspects
- c) Typical mechanical properties
- d) All of the above

132- A basic electrode would normally:

- a) Have superior mechanical properties
- b) Require baking before use
- c) Not be used on low carbon steels
- d) Both a) and b)

133-When referring to TIG welding, the shielding gas could be:

- a) Argon + Hydrogen
- b) Argon + Helium
- c) Argon + Nitrogen
- d) All of the above

134-When referring to MIG welding, the shielding gas could be:

- a) Argon
- b) Argon + 1% Oxygen
- c) Argon + 20% CO₂
- d) None of the above

135-Submerged arc welding:

- a) Deep penetration characteristic
- b) High deposition rate on DC+
- c) Flat (P.A.) welding only

136-Ultrasonic would be preferred over radiography due to:

- a) Ability to find more defects
- b) Lowest skill requirements
- c) Ability to detect laminations
- d) Both a) and c)

137-The most serious defects

- a) Planar

- b)Cracks
 - c)Lack of fusion
 - d)All of the above
- 138-The weld ability of a material may be affected by:
- a)Temperature of the component
 - b)The C.E. % of the material
 - c)The elements in the material
 - d)All of the above
- 139-Post heat treatment:
- a)Must be applied to welds if a crack free weld is required
 - b)Should never exceed 300 dg C
 - c)May stress relieve
 - d)Must always be applied using gas flames
- 140-Which of the following welding processes may be described, as a low hydrogen process in comparison with general MMA welding:
- a)TIG
 - b)MIG
 - c)MAG
 - d)None of the above
 - e>All f the above
- 141-Which form of NDT could be used on a fillet weld on aluminum?
- a)Dye penetrant testing
 - b)Ultrasonic testing
 - c)Radiography
 - d)MPI
 - e)a, b and c
 - f)D only
 - g)All of the above
- 142-Which of the following NDT methods would not detect sub-surfacedefects?
- a)MPI
 - b)Dye penetrant testing
 - c)Ultrasonic testing
 - d)Radiography
 - e)All of the above would detect sub-surface defects
- 143-Why have a high O.C.V. with MMA welding
- a)To initiate the arc
 - b)To obtain penetration
 - c)To avoid lack of fusion
 - d)MMA welding does not have a high O.C.V.
- 144-What is the purpose of a 'rectifier' in relation to welding plant?
- a)To adjust the voltage
 - b)To adjust the amperage
 - c)To convert A.C to D.C.
 - d)To prevent arc strikes
- 145-Fish – eyes, chevron cracks and fissures are:
- a)Not associated with welding
 - b)Types of cracks
 - c)Only encountered in MMA welds
 - d)Hydrogen related problems
- 146-Pre heating prior to welding:
- a)Must always be carried out
 - b)Need not be carried out if post heat treatment is to follow welding
 - c)Is always carried out using gas flame
 - d) None of the above
 - e)All of the above
- 147-What does pre heat prior to welding have an affect on:
- a)Hardenability
 - b)Weld ability
 - c)Cooling rate
 - d)All of the above
 - e)None of the above
- 148-The toes of the cap on a butt weld:
- a)Must overlap on the external surface of a pipe or plate by at least1.5mm
 - b)Must be grounded
 - c)Must never be grounded
 - d)None of the above
- 149-Which of the following butt-weld preparations is generally mostsusceptible to 'lack of side wall fusion' during MMA welding?
- a)A 'U' preparation
 - b)A 'V' preparation
 - c)A 'double V' preparation
 - d)Lack of side wall fusion does not exist with MMA

- 150-What is the leg length of a fillet weld?
- The distance from the toe to the face
 - The distance from the root and to the face center
 - The distance from the root to the toe
 - The distance from toe to toe
- 151-What is 'throat' thickness of the fillet weld?
- The distance from toe to the face
 - The distance from the root to face center
 - The distance from the root to the toe
 - The distance from toe to toe
- 152-Quality assurance is:
- The inspection of a product or service
 - A management system designed only to ensure material compatibility
 - Not solely related to planning and inspection
 - The implementation of quality control
- 153-Which welding process is considered the most versatile?
- SAW
 - TIG
 - MIG/MAG
 - MMA
- 154-Quality assurance:
- Is an other term for inspection
 - Related to all activities and functions concerned with the attainment of quality
 - Is the activity of ensuring documents relating to specific contracts are in order
 - Is the activity of carrying out quality control
- 155-Which NDT method would never be use on a 6" aluminum pipe weld?
- Radiography
 - Magnetic particle inspection
 - Ultrasonic testing
 - Dye penetrant testing
- 156-Why is hot – pass so-called?
- Because it is applied at a high amperage
 - Because it is applied when the root is still hot
 - Because it could cause 'hot – shortness'
 - Because it heat treats the root
- 157-Generally speaking a welding inspector, as a minimum requirement:
- Must have at a thorough knowledge of NDT
 - Must know how to interpret radiographs
 - Must have a thorough knowledge of welding metallurgy
 - None of the above
 - All of the above
- 158-Which of the following is not an inert gas?
- Argon
 - Xenon
 - Carbon dioxide
 - Helium
- 159-Why is welding is shielded?
- To eliminate hydrogen
 - To retard the cooling rate of the weld
 - To eliminate the atmosphere
 - To ensure maximum heat input
- 160-The primary duty of welding inspector:
- Is ensure welds are defect free
 - Is to ensure the weld is free from residual stresses
 - Is to write job specifications
 - Is to ensure all welding and associated activities are carried out in accordance with the procedure(s)
- 161-Which of the following welding processes is most susceptible to lack of fusion?
- Submerged arc
 - CO₂(metal active gas)
 - Manual metal arc
 - Tungsten inert gas
- 162-Fillet welds are
- Preferable to butt welds due to high strength
 - Difficult to assess with Non Destructive Testing in comparison with butt (groove) welds
 - Used only for 'appearance' purposes
 - Only feasible on steel
 - All of the above
- 163-API stands for
- Associated Pipeline Industries
 - American Pipe Institute
 - American Pipeline Institute
 - American Petroleum Institute
- 164-When welding using the MMA process, varying the arc length will give the most variation of:

- a)Voltage
 - b)Amperage
 - c)Polarity
 - d)None of the above
- 165-Lap joints contain:
- a)Fillet welds
 - b)Corner joints
 - c)Butt welds
 - d)Single bevel butt welds
- 166-Which arc welding process utilizes a non-consumable electrode?
- a)MIG
 - b)TIG
 - c)MMA
 - d)SAWe)All of the above
- 167-A welding Inspector:
- a)Must know how to interpret radiographs
 - b)May be required to interpret radiographs on certain contracts
 - c)Should be able to weld
 - d)Both b and c
 - e)All of the above
- 168-Which electrodes are very susceptible to causing porosity in the depositedwelds if long arc employed?
- a)Basic
 - b)Cellulosic
 - c)Rutiled)None of the above
- 169-What do you understand by the term ‘minimum interpass temperature’
- a)Minimum pre heat temperature
 - b)Minimum stress relieve temperature
 - c)The lowest temperature to be used when normalizing
 - d)The lowest temperature allowed during welding and between passes
- 170-Is it permissible to allow a single ‘V’ butt weld to cool down passes?
- a)It is solely the decision of the welder
 - b)It depends on the requirement of the procedure and specifications
 - c)It is solely the decision of the welding inspector
 - d)No, all welds should be completed before dropping the temperature to ambient
- 171-What is the problem with ‘restraint’ during welding?
- a)It does not cause a problem
 - b)It may lead to cracking, especially with small welds between large components
 - c)It causes distortion
 - d)Restraint is term not used in relation to welding
- 172-Which mechanical test (s) can b e used to make an assessment of surfacing breaking defects?
- a)Bend test
 - b)Nick – break test
 - c)Macro test
 - d)None of the above
 - e)All of the above
- 173-What is the purpose of a tensile test?
- a)To assess tensile strength
 - b)To assess ductility
 - c)To assess yield strength
 - d)All of the above could be assessed
- 174-When a metal returns to its original shape after an applied load has beenremoved, the metal is said to have:
- a)Plasticity
 - b)Ductility
 - c)Elasticity
 - d)Malleability
- 175-Fluctuating load is: cyclic stresses, below the UTS on a weld componentmay lead to:
- a)Tensile failure
 - b)Yield failure
 - c)Fatigue failure
 - d)Shear failure
- 176-Stress is equal to:
- a)Stress
 - b)Load divided by cross – sectional area
 - c)Extension of gauge length divided by original gauge length
 - d)Toughness
- 177-Strain is equal to:
- a)Stress
 - b)Load divide by cross – sectional are
 - c)Extension of gauge length divided by the original gauge length
 - d)Toughness
- 178-Stress can be measured in:

- a)N/mm²
 - b)PSI
 - c)mm
 - d)Both a and b
- 179-What is a crater pipe?
- a)An oval tube
 - b)Another term for burn through
 - c)A type of porosity
 - d)A shrinkage defect
- 180-Which British standard relates to welding term and symbols
- a)BS 639
 - b)BS 638
 - c)BS 18
 - d)BS 499
- 181-How could you accurately measure the root radius of a charpy or Izodspecimen?
- a)With a machine called shadowgraph
 - b)With a rule
 - c)With a vernier caliper
 - d)With a densitometry
- 182-Herringbone porosity is:
- a)A particular pattern of porosity
 - b)Made up of wormholes
 - c)Made up of piping
 - d)All the above are correct
 - e) None of the above
- 183-A crack is a weld zone:
- a)Is repairable
 - b)Always results in s cut – out and complete reweld
 - c)Is acceptable up to 2mm in length
 - d)May be repaired or cut – out depending on specificationrequirements.
- 184-If the amperage were too low during the welding of a root bead the possible result would be:
- a)Lack of penetration
 - b)Lack of fusion
 - c)The freezing of the electrode
 - d)All of the above
- 185Stress acting in the opposite direction of compressive stress is known as:
- a)Residual stress
 - b)Shear stress
 - c)Hoop stress
 - d)Tensile stress
- 186-Distortion may be affected by:
- a)Restraint
 - b)Heat – input
 - c)Material properties
 - d)Material thickness
 - e)All of the above
- 187-Distortion:
- a)Is plastic deformation
 - b)Is elastic deformation
 - c)Is another term for stress
 - d)May be elastic or plastic deformation
 - e)All of the above

Answers

1. B, 2.D, 3.B, 4. D, 5. D, 6. B, 7. C 8. A, 9. C, 10.B, 11. B, 12. D, 13.C, 14. B, 15. A, 16. D, 17. D, 18. B, 19. A, 20. B, 21 B, 22. A, 23. D, 24. D, 25. B, 26. C, 27.c, 28. B, 29. C, 30. A, 31. C, 32. A, 33. D, 34. A, 35. B, 36. B, 36. A, 37. A, 38. B, 39. A, 40. D, 41. C, 42. A, 43. D, 44. C, 45. C, 46. D, 47. D, 48. D, 49.d, 50. B, 51. B, 52. C, 53. B, 54. C, 55. B, 56. B, 57. C, 58. B, 59. B, 60. B, 61. D, 62. C, 63. B, 64. C, 65. C, 66. B, 67. B, 68. B, 69. B, 70. D, 71. A, 72. D, 73. D, 74. D, 75. C, 76. D, 77. D, 78. A, 79. D, 80. D, 81. D, 82. B, 82. A, 83. A, 84. A, 85. C, 86. D, 87. A, 88. D, 89. D, 90. D, 91. D, 92. C, 93. D, 94.d, 95.d, 96. B, 97. C, 98. B, 99. C, 100. B, 101. C, 102. B, 103. A, 104. A, 105. B, 106. B, 107. A, 108. A, 109. B, 110. A, 111. D, 112. C, 113. C, 114. B, 115. C, 116. A, 117. C, 118. A, 119. A, 120. B, 121. D, 122. D, 123. B, 124. D, 125. D, 126. B, 127. A, 128. D, 129. C, 130. D, 131. D, 132. D, 133. B, 134. A, 135. C, 136. C, 137. D, 138. D, 139. C, 140. E, 141. B, 142. B, 143. A, 144. C, 145. A, 146. D, 147. D, 148. A, 149. A, 150. C, 151. B, 152. C, 153. D, 154. B, 155. B, 156. D, 157. D, 158. C, 159. C, 160. D, 161. B, 162. B, 163. D, 164. A, 165. A, 166. B, 167. B, 168. A, 169. D, 170. B, 171. B, 172. E, 173. D, 174. C, 175. C, 176. B, 177. C, 178. C, 179. D, 180. D, 181. A, 182. E, 183. D, 184. D, 185. D, 186. E, 187. D,