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 a weld that as been made 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 resisitive 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 in?

a) Pounds per square inch
b) Joules
c) Newtons 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) Clinometer

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 CO-2 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 is 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 ferritic weld metal?

a) Cellulosic electrodes
b) Submerged arc with acid flux
c) Spray transfer Co-2-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 crack 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 improving
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 midthickess lamination in steel plate normaly 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) Plater 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 form 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 CO-2 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 along 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 have under cut

37 A welder qualification test is o 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 rood 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 o 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 I 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; thses 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?

a) Shows reduction in size
b) Is flat and featureless
c) Breaks in the weld metal
d) Breaks in the parent material

68 What destructive test would be required to ascertain the likelihood of cracking in the HAZ of a weld?

a) Nick break
b) Side bend test
c) Charpy input
d) Macro test

69 In submerged arc welding, excessive arc voltage may cause?

a) Excessive penetration
b) Change in weld metal composition
c) Narrow weld width
d) Excessive bead profile

70 The British code for visual inspection requirements is:

a) BS4872
b) BS499
c) BS4870
d) None of the above

71 A code of practice for visual inspection should cover the following:

a) Before, during and after welding activities
b) Before welding activities only
c) After welding activities only
d) None of the above

72 Incomplete penetration in a butt joint could be caused by:

a) Excessive root face width
b) Excessive root gap size
c) Low current setting
d) Both A & C

73 Incomplete root fusion weld certainly be caused by:

a) Linear misalignment
b) Incorrect tilt angle
c) Differing root face widths
d) All of the above

74 When visually inspecting a completed single vee butt weld cap you would certainly assess:

a) Cap height
b) Toe blend
c) Weld width
d) A, B & C

75 You notice a very "veed" ripple shape. This is most likely caused by:

a) Poor consumable choice
b) Welding position
c) Excessive travel speed
d) All of the above

76 "Toe blending" is important as it may affect:

a) Corrosion
b) Fatigue life
c) Overlap type defects
d) All of the above

77 Slag inclusion would occur with:

a) Manual metal arc
b) Metal inert gas
c) Submerged arc welding
d) Both A & C

78 Undercut principally caused by:

a) Excessive amps
b) Excessive volts
c) Excessive travel speed
d) All of the above

79 Undercut normally assessed by:

a) Its depth
b) Its length
c) Its blending
d) All of the above

80 A welding procedure is useful to:

a) Give information to the welder
b) Give information to the inspector
c) Give "Confidence" to a product
d) 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. Thses 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) "Cheveron" – 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 t he 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 (interun)
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 contaminates
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) Intergranular 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 t he 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 if 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% CO_2
d) None of the above

135 Submerged arc utilities:

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

136 Ultrasonic would be prefer 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 weldability 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 required1
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-surface defects?

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) Weldability
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 least 1.5mm
b) Must be grounded
c) Must never be grounded
d) None of the above

149 Which of the following butt-weld preparations is generally most susceptible 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?

a) The distance from the toe to the face
b) The distance from the root and to the face center
c) The distance from the root to the toe
d) The distance from toe to toe

151 What is 'throat' thickness of the fillet weld?

a) The distance from toe to the face
b) The distance from the root to face center
c) The distance from the root to the toe
d) The distance from toe to toe

152 Quality assurance is:

a) The inspection of a product or service
b) A management system designed only to ensure material compatibility
c) Not solely related to planning and inspection
d) The implementation of quality control

153 Which welding process is considered the most versatile?

a) SAW
b) TIG
c) MIG/MAG
d) MMA

154 Quality assurance:

a) Is an other term for inspection
b) Related to all activities and functions concerned with the attainment of quality
c) Is the activity of ensuring documents relating to specific contracts are in order
d) Is the activity of carrying out quality control

155 Which NDT method would never be use on a 6" aluminum pipe weld?

a) Radiography
b) Magnetic particle inspection
c) Ultrasonic testing
d) Dye penetrant testing

156 Why is hot – pass so-called?

a) Because it is applied at a high amperage
b) Because it is applied when the root is still hot
c) Because it could cause 'hot – shortness'
d) Because it heat treats the root

157 Generally speaking a welding inspector, as a minimum requirement:

a) Must have at a thorough knowledge of NDT
b) Must know how to interpret radiographs
c) Must have a thorough knowledge of welding metallurgy
d) None of the above
e) All of the above

158 Which of the following is not an inert gas?

a) Argon
b) Xenon
c) Carbon dioxide
d) Helium

159 Why is welding is shielded?

a) To eliminate hydrogen
b) To retard the cooling rate of the weld
c) To eliminate the atmosphere
d) To ensure maximum heat input

160 The primary duty of welding inspector:

a) Is ensure welds are defect free
b) Is to ensure the weld is free from residual stresses
c) Is to write job specifications
d) 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?

a) Submerged arc
b) CO_2 (metal active gas)
c) Manual metal arc
d) Tungsten inert gas

162 Fillet welds are

a) Preferable to butt welds due to high strength
b) Difficult to assess with Non Destructive Testing in comparison with butt (grove) welds
c) Used only for 'appearance' purposes
d) Only feasible on steels
e) All of the above

163 API stands for

a) Associated Pipeline Industries
b) American Pipe Institute
c) American Pipeline Institute
d) 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) SAW
e) 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 deposited welds if long arc employed?

a) Basic
b) Cellulosic
c) Rutile
d) 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 been removed, 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 component may 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 Izod specimen?

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 specification requirements.

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

185 Stress 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