OBJECTIVE TYPE QUESTIONS

1. In the following type of layout, product remains fixed and the operations facilities move around the product:
   (a) Functional type (b)Fixed Position (c) Line type (d) Group layout
2. Continuous production can be carried out in:
   (a) Functional type (b)Fixed Position (c) Line type (d) Group layout
3. Productivity is the ratio of:
   (a) Input divided by output (b) Output divided by input
   (c) Output divided by sum of input and output (d) None of the above
4. Factories Act is linked with the year:
   (a)1950 (b)1948 (c) 1956 (d) 1947
5. Body centered cubic lattice contains:
   (a) 14 atoms (b) 9 atoms (c) 12 atoms (d) 8 atoms
6. Which of the following properties pertain to cast iron?
   (a)Resistance (b)Ductility
   (c) Wear resistance (d)Toughness
7. In steel, pearlite phase is made up of alternate layers of:
   (a) Ferrite and martensite (b) Ferrite and cementite
   (c) Martensite and cementite (d) Cementite and bainite
8. In which of the following types of steel, carbon content is highest?
   (a) Hypo-eutectic steel (b)Eutectic steel
   (c) Hyper-eutectic steel (d)Mild steel
9. Which type of iron is the magnetic allotrope of iron?
   (a) α (b) β (c) γ (d) δ
10. Brinell hardness tester uses a hardened steel ball of size.
    (a)5 mm (b) 10 mm (c) 15 mm (d) 20 mm
11. Which type of steel is widely used fro rails of a railway track?
    (a)Mild (b)High Carbon (c)Silicon (d)Nickel
12. Hooke's law is obeyed by every material
    (a) Within plastic limit (b) Within yield point
    (c) Up to limit of proportionality (d) None of the above
13. Which type of alloy does not contain copper?
    (a)German silver (b)Muntz metal
    (c)Gun metal (d)White metal
14. What does good impact strength indicate?
    (a) Good ductility (b) Good wear resistance
    (c) Good wear resistance (d) Good fatigue behaviour

15. Brinell hardness number (BHN) is expressed by the equation

(a) $BHN=\frac{2P}{\pi D(D-\sqrt{D^2-d^2}}$

(b) $BHN=\frac{2P}{\pi D-D\sqrt{D^2-d^2}}$

(c) $BHN=\frac{2P}{\pi D(1-\sqrt{D^2-d^2}}$

(d) $BHN=\frac{2P}{\pi(D-\sqrt{D^2-d^2}}$

16. Austenite is solid solution of carbon in iron type:
(a) α (b) β (c) γ (d) δ
17. Which type of the following alloy has excellent resistance to acids?
(a)Permalloy (b)Constantan (c)Hastelloy (d)Monel metal
18. Which type of the following characteristic can be attributed for gold?
(a) Ferro-electric (b)Ferro-magnetic
(c) Dia-magnetic (d)Para-magnetic
19. Annealing of white cast iron is done to obtain
(a) Wrought iron (b) Spheroidal iron
(c) Nodular iron (d) Malleable iron
20. Depth of hardness of steel increases by addition of
(a) Silicon (b) Chromium (c) Vanadium (d) Nickel
21. Hardness of martensite on Rockwell C scale is
(a) 45 Rc (b) 50Rc (c) 58 Rc (d) 65 Rc
22. The hardest known material is:
(a) Cemented carbide (b) Ceramic (c) Diamond (d) Alloy
23. High speed steel contains:
(a) 18% tungsten, 4% chromium, 1% vanadium
(b) 18% tungsten, 4% vanadium, 1% chromium
(c) 18% tungsten, 8% nickel, 1% manganese
(d) 18% tungsten, 4% manganese, 1% nickel
24. Cupola is used for production of the following material
(a) Mild steel (b) Pig iron (c) Cast iron (d) Wrought iron
25. Ball bearings are generally made of
(a) Grey cast iron (b) Carbon chrome steel
(c) Stainless steel (d) Carbon steel
26. The corrosion resistance property of stainless steel is due to the presence of:
(a) Manganese (b) Chromium (c) Cobalt (d) Silicon
27. Heat treatment is necessary on the following steel components
(a) Castings (b) Forgings (c) Rolled parts (d) All the above

28. Which type of surface hardening process gives maximum hardness for steel?
    (a) Pack hardening (b) Nitriding
    (c) Cyaniding (d) Induction hardening
29. Selection of heat treatment process depends on
    (a) Chemical composition of metal
    (b) Recrystallization temperature of metal
    (c) Critical temperature of metal
    (d) Structural changes required
30. Which one of the following is not a heat treatment process
    (a) Annealing (b) Tempering (c) Sintering (d) Cyaniding
31. At room temperature, ferrite has a
    (a) Cubic structure (b) BCC structure
    (c) FCC structure (d) CPH structure
32. The main constituent of 0.8% annealed steel is
    (a) Ferrite (b) Cementite (c) Martensite (d) Pearlite
33. The main constituent of 0.8% hardened steel is
    (a) Cementite (b) Martensite (c) Ledebrite (d) Sorbite
34. The hardness of a component is reduced considerably by
    (a) Annealing (b) Hardening (c) Tempering (d) Stress relieving
35. Mild steel is also know as
    (a) High carbon steel (b) Medium –carbon steel
    (c) Low-carbon steel (d) Alloy steel
36. Delta iron is stable
    (a) At room temperature (b) Above melting point
    (c) Between 910 and 1410^{0}C (d) Between 1410 and 1539^0 C
37. Ferromagnetic alpha iron transforms to paramagnetic alpha iron at the following temperature on heating
    (a) 723^{0}C (b) 777^{0}C (c) 910^0 C (d) 1400^0 C
38. Eutectoid steel contains the following amount of carbon
    (a) Less than 0.3 % (b) 0.3-0.6% (c) 0.8% (d) 1.2-2.0%
39. Corrosion resistance of steel is increased by adding
    (a) Manganese and nickel (b) Chromium and tungsten
    (c) Chromium and nickel (d) Chromium and vanadium
40. Cementite consists of
    (a) 13 percent of carbon and 87 percent ferrite
    (b) 13 percent cementite and 87 percent ferrite
    (c)13 percent ferrite and 87 percent cementite
    (d) 6.67 percent carbon and 93.33 percent iron
41. Steel with 0.8 percent carbon and 100 percent pearlite is called
    (a) Eutectoid steel (b) Hypo-eutectoid steel
    (c) Hyper-eutectoid steel (d) None of these
42. The essential constituent of a hardened steel is
    (a) Pearlite (b) Austenite (c) Martensite (d) Troostite (e) Sorbite

43. The property of a material by virtue of which it can withstand or support an external force or load without rupture, is known as
(a) Malleability (b) Plasticity (c) Toughness (d) Brittleness
44. The creep is that property of material by virtue of which
(a) It fails at a stress below the yield point stress, when the material is subjected to repeated stress.
(b) It undergoes a slow and permanent deformation at constant stress
(c) It will fracture or break without any appreciable deformation
(d) It stores energy and resists shock and impact loads
45. Which of the following is a non-destructive test?
(a) Tensile Test (b)Ultrasonic test
(c) Compression test (d) Creep test
46. In a radiographic test for the detection of internal defects
(a) Ultrasonic vibrations are transmitted to the surface of the component.
(b) Some coloured liquid is sprayed on the surface of the component.
(c) X-rays or gamma rays are passed through the component.
(d) A special equipment known as magnaflux is used
47. The melting point of iron is the lowest for
(a) Low carbon steel (b) high carbon steel
(c) Cast iron (d) Wrought iron
48. Pearlite is a combination of
(a) Ferrite and iron graphite (b) Ferrite and cementite
(c) Ferrite and austenite (d) Cementite and gamma iron
49. The minimum amount of carbon in gray cast iron is
(a) 0.6% (b) 0.8% (c) 2.5% (d) 4.3%
50. In gray cast iron, carbon is present in the following form
(a) Free carbon (b) flakes
(c) Cementite (d) Nodular aggregates of graphite
51. In malleable iron, carbon exists in the following form
(a) Free carbon (b) Flakes
(c) Cementite (d) Nodular aggregates of graphite
52. Balls used in ball bearings are made of
(a) Carbon-nickel steel (b) Carbon-tungsten steel
(c) Carbon-tungsten steel (d) Carbon-vanadium steel
53. Nitriding does not have the objective of:
(a) To increase wear resistance (b) To refine grain size
(c) To increase surface hardness (d) To increase fatigue limit
54. The following metal does not contain tin as an alloying element:
(a) Babbit Metal (b) White metal
(c) Phosphor bronze (d) Solder
55. Steel can be hardened quickly by
(a) Carburising (b) Cyaniding (c) Induction hardening (d) Nitriding

56. Which of the following hardening processes is not generally used for steels?
    (a) Nitriding (b) Cyaniding
    (c) Age hardening (d) Induction hardening
57. Presence of sulphur in cast iron
    (a) Promotes oxidation (b) Retards fluidity
    (c) Promotes brittleness (d) All of the above
58. By adding which of the following, corrosion resistance of steel is increased?
    (a) Tungsten and vanadium (b) Aluminium and zinc
    (c) Chromium and nickel (d) Nickel and molybdenum
59. What is the product of cupola?
    (a) Wrought iron (b) Cast iron (c) Mild steel (d) Pig iron
60. Which of the following metal is having maximum malleability?
    (a) Zinc (b) Copper (c) Lead (d) Wrought iron
61. The most important element which controls the physical properties of steel:
    (a) Chromium (b) Vanadium (c) Carbon (d) Tungsten
62. Which of the following heat treatment processes can harden a small selected portion of the job?
    (a) Nitriding (b) Cyaniding
    (c) Pack hardening (d) Flame and induction hardening
63. Steel is primarily designated
    (a) According to tensile strength (b)According to carbon content
    (c) According to alloying elements (d) According to iron content
64. Which of the following test is non-destructive?
    (a) Impact (b) Charpy (c) Radiography (d) Tensile
65. What is hardenability of steel?
    (a) Ability to withstand shocks
    (b) Property which determines the depth of the hardened zone induced by quenching
    (c) Ability of steel to resist abrasion, wear and penetration.
    (d) All of the above
66. How can be recrytallisation temperature be lowered?
    (a) By working at lower temperature (b) By grain refinement
    (c) By purification of metal (d) All of the above
67. Babbit metal is an alloy of
    (a) Cu and Zn (b)Sn and Cu
    (c) Sn, Cu and Sb (d)Sn, Cu, Sb and Pb
68. Which of the following alloying elements help improve corrosion resistance of steels?
    (a) Nickel and chromium (b)Chromium and vanadium
    (c) Molybdenum and chromium (d)Nickel and molybdenum

69. In blast furnace the following is used as fuel:
(a) Producer gas (b) Coal (c) Coke (d) Diesel
70. The components which are cold worked are generally subjected to
(a) Hardening (b) Tempering (c) Normalising (d) Annealing
71. Which of the following is an object of annealing?
(a)To remove internal stresses and machinability
(b)To refine grain structure
(c)To soften the metal
(d)All of the above
72. By which of the following processes, steel pipes are generally manufactured?
(a) Cold working process (b) Extrusion process
(c) Electroforming process (d) Machining process
73. Annealing of components is done to increase
(a) Hardness (b) Wear resistance
(c)Machinability (d) Fatigue resistance
74. How are cast irons generally specified?
(a) By Hardness (b) By tensile strength
(c) By percentage iron (d) All of the above.
75. Structural sections such as rails, angles, I-beams are made by
(a) Hot rolling (b) Hot drawing (c) Hot piercing (d) Hot extrusion
76. A two-high rolling mill consists of two rolls which rotate
(a) At the same speed and in the same direction
(b) At the same speed but in opposite direction
(c) At different speeds and in the same direction
(d) At different speeds and in the opposite direction
77. Cold working of metal increases
(a) Tensile strength (b) Yield strength (c) Hardness (d) All of these
78. The process of increasing the cross-section of a bar at the expense of its length is called
(a) Drawing (b) Upsetting (c) Spinning (d) Peening
79. The process of decreasing the cross-section of a bar and increasing its length is called
(a) Drawing down (b) Upsetting (c) Spinning (d) Peening
80. Which of the following properties should high speed steel possess?
(a) Wear resistance (b) Hardenability
(c) Toughness (d) Both (a) and (b) above
81. For high energy rate forging the following statement is not correct:
(a) They can be used to form powered metal forms.
(b) The gas drives the ram for the impact.
(c)Up to a high tolerance of $\pm$ 0.25mm can be achieved.
(d)These machines are very expensive to operate.

82. An important product manufactured by rolling is
(a) Rollers (b) Tubes (c) I-section (d) Metal rolls
83. Long wires are made by
(a) Swaging (b) Rolling (c) Drawing (d) Extrusion
84. External screw threads can be produced by:
(a) Casting (b) Shaping (c) Milling (d) Rolling
85. Collapsible toothpaste tubes are made by ..... process
(a) Injection moulding (b) Indirect extrusion
(c) Direct extrusion (d) Impact extrusion
86. Stretch forming is the process of
(a)Forging (b) Cold rolling (c) Extrusion (d) Cold drawing
87. Hammers used in fitting shop are made of
(a) Wrought iron (b) Low-carbon steel
(c) Medium-carbon steel (d) High carbon steel
88. Steel balls are manufactured by:
(a) Machining (b) Spinning (c) Casting (d) Cold heading
89. After cold forming, steel balls are subjected to
(a) Electroplating (b) Normalising
(c) Tempering (d) Stress relieving
90. The most suited press for coining and embossing is:
(a) Hydraulic press (b) Rack and pinion press
(c) Toggle press (d) Knuckle joint press
91. Injection moulding is the ideal method of processing
(a) Non-ferrous alloys (b) Thermosetting plastics
(c) Plastics (d) Thermoplastics
92. Important property for the material to be successfully extruded is
(a) Elasticity (b) Plasticity
(c) Ductility (d) Durability
93. The fullers are used
(a) For finishing flat surfaces
(b) For necking down a piece of work
(c) For punching a hole
(d) To finish the punched hole
94. Which of the following materials can be forged?
(a) High speed steel (b) Wrought iron
(c) Cast iron (d) Mild iron
95. Which of the following processes makes seamless tubes?
(a) Cold rolling (b) Piercing (c) Plug rolling (d) Forging
96. Hardness of carbon tool steels is increased when alloyed with:
(a) Silicon (b) Tungsten (c) Manganese (d) Chromium and vanadium

97. Regarding thermosetting plastics, which of the following statements is correct?
(a) They are produced on synthesis basis
(b) They permanently set with heat and can not be deformed when again subjected to heat
(c) They soften on application of heat and can be moulded again.
(d) None of the above.

98. The following is not classified as a drop hammer during forging:
(a) Board hammer.
(b) Hot hammer.
(c) Air-lift hammer.
(d) Power drop hammer.

99. For Press forging which of the statement is correct:
(a) Press forging is done with the help of hammer.
(b) Small parts like rivets, bolts can not be produced.
(c) Shape of product is accurate.
(d) Cannot be used for mass production.

100. The material of pattern is used in investment casting:
(a) Wooden (b) Wax (c) Metal (d) Any of the listed.

101. High energy rate forming process is:
(a) Upsetting (b) Explosive fabrication (c) Rolling (d) Forging

102. In arc welding, arc is created between the electrode and work by
(a) Contact resistance (b) Flow of voltage
(c) Flow of current (d) Electrical energy

103. In resistance welding, pressure is released
(a) During heating period (b) After the weld cools
(c) No pressure is applied (d) None of the above

104. Which of the following processes uses the non-consumable electrode?
(a) TIG welding (b) Laser welding
(c) MIG welding (d) Plasma arc welding

105. Material used for coating the electrode is called
(a) Flux (b) Slag (c) Protective layer (d) Deoxidiser

106. The welding process in which two pieces to be joined are overlapped and placed between two pointed electrodes is:
(a) Seam welding (b) Resistance welding
(c) Projection welding (d) Spot welding

107. Which of the following gases are used in Tungsten inert gas welding?
(a) Helium and neon (b) Hydrogen and oxygen
(c) Argon and helium (d) Carbon dioxide and hydrogen

108. Preheating is essential in welding
(a) Aluminium (b) Copper (c) Cast iron (d) Stainless steel

109. The temperature, in arc welding, is of the order of
(a) 3000^0 C (b) 4000^0 C (c) 5500^0 C (d) 7000^0 C

110. In electric resistance welding, voltage required for heating is
(a) 1 to 5 volts (b) 6 to 10 volts
(c) 11 to 20 volts (d) 50 to 100 volts

111. Seam welding is a
(a) Arc welding (b) multi-spot welding process (c) continuous spot welding process (d) process used for joining round bars

112. In arc welding, the electric arc is produced between the work and the electrode by
(a) Voltage (b) Flow of current
(c) Contact resistance (d) All of these

113. The Consumable electrode is used in
(a) Carbon arc welding (b) Submerged arc welding
(c) TIG arc welding (d) MIG arc welding

114. In TIG arc welding, the welding zone is shielded by an atmosphere of
(a) Hydrogen gas (b) Oxygen gas (c) Helium gas (d) Argon gas

115. Upon which of the following parameters does the current intensity in arc welding depend?
(a) Stability of arc (b) Electrode diameter (c) Gap between the electrodes and parent metals (d) Thickness of parent metals.

116. In the following type of welding process heat is produced for welding by chemical reaction:
(a) Resistance welding (b) Thermit welding
(c) Forge welding (d) Gas welding.

117. In case of submerged arc welding, the electrodes upto ..... diameter maybe used.
(a) 30 mm (b) 20 mm (c) 15 mm (d) 12

118. In this type of welding two non-consumable electrodes are used.
(a) MIG (b) TIG (c) Atomic hydrogen (d) Submerged arc

119. For gray cast iron, which of the following welding methods is preferable?
(a) MIG (b) Submerged arc (c) Gas flame (d) Electric arc

120. Due to which of the following reasons, no flux is used in atomic hydrogen welding?
(a) The burning hydrogen shields the molten metal
(b) Two electrodes are coated which gradually release the flux
(c) The filler rod is coated with flux
(d) One of two electrodes is coated which releases the flux

121. Thermit, used in thermit welding, is a mixture of
(a) Charcoal and iron oxide
(b) Charcoal and aluminium
(c) Iron oxide and aluminium
(d) Charcoal, iron-oxide and aluminimum

122. The oxy-acetylene gas used in gas welding produces a flame temperature of
(a) 1800^0 C (b) 2100^0 C (c) 2400^0 C (d) 3200^0 C
123. Acetylene gas is stored in cylinder in
(a) Solid form (b) Gaseous form (c)liquid form (d) any one of these
124. Most of the oxy-acetylene welding is done with
(a) Neutral flame (b) Oxidizing flame
(c) Carbursing flame (d) All of these
125. The maximum flame temperature occurs
(a) At the outer cone (b) At the inner cone
(c) Between the outer and inner cone (d) At the torch tip
126. A neutral flame is obtained by supplying
(a) Equal volumes of oxygen and acetylene
(b) More volume of oxygen and less volume of oxygen
(c) More volume of acetylene and less volume of oxygen
(d) None of the above
127. Carburising flame is used to weld
(a) Steel, cast iron, copper, aluminium etc. (b) Brass and bronze
(c) Hard surfacing materials such as satellite (d) All of the above
128. A LASER welding finds widest applications in
(a) Electronic industry (b) Heavy industry
(c) Structural work (d) None of the above
129. Weld spatter is a :
(a) Catalyst (b) Welding defect (c) Flux (d) Welding technique
130. TIG welding is best suited for welding
(a) Silver (b) Mild steel (c) Aluminium (d) Stainless steel
131. Projection welding refers to:
(a) Pressure welding (b) TIG welding
(c) Submerged welding (d) Resistance welding
132. In MIG welding, metal is transformed in the form of
(a) Molecules (b) Molten drops
(c) Weld pool (d) A fine spray of metal
133. Acetylene gas is generated from
(a) Calcium (b) Carbon
(c) Calcium carbonate (d) Calcium carbide
134. In which of the following welding processes, electrode gets consumed?
(a) TIG Welding (b) Resistance welding
(c) Thermit welding (d) Arc welding
135. Which of the following statements about 'submerged arc welding' is correct?
(a) Arc is submerged is molten metal bath
(b) Arc is maintained under a blanket of flux
(c) There is no arc in actual (d) None of the above

136. In case of neutral flame, oxygen to acetylene ratio is
(a) 0.6:1.0 (b) 1:1 (c) 2:1 (d) 3:1
137. Neutral flame has zones of:.
(a) Two (b) Three (c) Four (d) Unpredictable
138. For the following reasons, welding of stainless steel is difficult?
(a) Formation of oxide film
(b) Melting point of stainless steel is very high
(c) Fear of cracking
(d) Formation of rust
139. In arc welding the length of arc should be equal to
(a) Half the electrode diameter (b) Electrode diameter
(c) Twice the electrode diameter (d) None of the above
140. Compared to oxyacetylene flame, temperature of oxy-hydrogen flame is:
(a) Less (b) Same (c) More unpredictable (d) Any of the above.
141. In gas welding, more commonly used flame is
(a) Less luminous (b) Equal luminous
(c) More luminous (d) Any of the above
142. The type of welding best suited for joining two stainless steel foils of thickness 0.1 mm is:
(a) MIG (b) TIG (c) Plasma arc (d) Gas
143. Stellite is the trade name for:
(a) Advanced ceramics (b) Ferrous cast alloys
(c) Non-ferrous cast alloys (d) None of the above
144. Oxidizing flame is used to weld metals/materials like
(a) Copper and brass (b) Aluminium, stainless steel, nickel etc.
(c) Abrasive (d) None of the above.
145. In thermit welding, iron oxide and aluminium oxide are mixed in the proportion of
(a) 1:1(b) 2:1 (c) 3:1 (d) 1:3
146. In arc welding, weaving refers to
(a) Arc blow action due to pressure applied
(b) Side to side motion of electrode at right angle to the direction of welding
(c) Spiral motion of electrode (d) None of the above
147. In lost wax casting, tolerance is of the order of
(a) ± 2 mm (b) ±0.2mm (c) ±0.02 mm (d) ± 0.005 mm
148. In flaskless moulding, the sand is compacted in chamber by
(a) Squeezing (b) Ramming properly
(c) Exposing to sun (d) None of the above
149. Which material of the following is not a ceramic material?
(a)Glass (b)Bakelite (c) Clay (d)Aluminium oxide

150. Rotary swaging is used for:
(a) Flattening the surface
(b) Manufacturing bolts and rivets
(c) Reducing diameter of round bars and tubes by rotating die.....
(d) Manufacturing seamless tubes

151. Chisels for metal cutting are hardened:
(a) At top (b) At tip (c) At cutting edge (d) All over

152. The category of steel used for chisels is:
(a) High carbon (b)Mild
(c) Medium carbon (d)Dead mild

153. Lead is hot worked at:
(a) Room temperature (b) 150°C (c) 250°C (d) 550°C

154. Which of the following is an advantage of centrifugal casting?
(a) Mass production with reduced rejection possible
(b) Dense casting (c) Elimination of core (d) All of the above

155. Which of the following materials is used for preparing master mould for non-ferrous casting?
(a) Gypsum products (b) Plaster of paris
(c) Any of above (d) None of the above

156. What is the function of a swab?
(a) To repair and finish the mould
(b) To apply water to the mould around the edge of the pattern
(c) To shake pattern to facilitate its withdrawal from the mould.
(d) None of the above

157. Allowance that can be ignored in small castings:
(a) Draft (b) Machining (c) Rapping (d) Shrinkage

158. For which of the following purpose, a slick is mainly used?
(a) To remove pattern from the mould
(b) To provide opening in moulds
(c) To repair and finish the moulds
(d) All of the above.

159. Material used for core sand is:
(a) Mineral oil (b) Molasses
(c) Linseed oil (d) Any of the above

160. On which of the following does the location of riser least depend?
(a) Design of casting (b) Metal to be cast
(c) Size of the core (d) Feasibility of directional solidification

161. Hot tears in castings are caused by:
(a) High dry and hot strength of mould
(b) Excessive mould hardness
(c) Either of the above
(d) None of the above.

162. Converting metallic powders into articles of definite form is known as:
(a) Carbiding (b) High pressure pressing
(c) Powder metallurgy (d) None of the above

163. Hot spots are generally found in castings
(a) Symmetrical about two axes
(b) Having abrupt variation is section
(c) Small in weight but large in volume
(d) All of the above.

164. For which of the following metals, die-casting is not generally used?
(a) Cast iron (b) Aluminium based alloys
(c) Zinc based alloys (d) Non-ferrous alloys

165. Investment casting is also known as
(a) Hot investment casting (b) Lost wax casting
(c) Lost pattern casting (d) Any of the above

166. Chaplets are:
(a) Core projections (b) Core binders
(c) Core supports (d) Mould seats

167. Padding in casting is
(a) An extra metal welded to the original uniform section of the casting
(b) A method for production of chilled castings.
(c) An extra support for thin castings
(d) None of the above.

168. Slag and dross can be reduced by
(a) Using pouring basin in place of pouring cup
(b) Skimming form the molten metal
(c) Using bottom pouring ladle
(d) Any of the above

169. Metal moulds are used in
(a) Die casting process (b) Dry sand process
(c) Green sand moulding (d) Loam moulding

170. Cohesiveness of sand depends upon
(a) Moisture content (b) Bonding materials
(c) Grain size and shape (d) All of the above

171. For which of the following castings, skeleton patterns are used?
(a) Large castings (b) Small castings
(c) Hollow castings (d) Non-ferrous castings

172. When a pattern is made in three parts, the top part is known as a
(a) Drag (b) Cheek (c) Cope (d) Any one of the above

173. A taper provide on the pattern for its easy and clean withdrawal from the mould is know as
(a) Machining allowance (b) Draft allowance
(c) Shrinkage allowance (d) Distortion allowance

174. The surface to be left unmachined is marked on the pattern by
(a) Red color (b) Yellow colour (c) Black colour (d) Blue
175. Riddle is used for
(a) Smoothing and cleaning out depressions in the mould
(b) Cleaning the moulding sand
(c) Moistening the sand around the edge before removing pattern
(d) Reinforcement of sand in the top part of moulding box
176. In order to produce uniform packing of sand in the mould.
(a) A sand slinger is used (b) A squeezing machine is used
(c) A jolt machine is used (d) A stripper plate machine is used
177. In order to deliver molten metal from pouring basin to gate
(a) A riser is used (b) A sprue is used
(c) A core is used (d) A gagger is used
178. In a centrifugal casting method
(a) Core is made of sand (b) Core is made of ferrous metal
(c) Core is made of non-ferrous metal (d) No core is used
179. A casting defect which results in general enlargement of a casting is known as
(a) Shift (b) Sand wash (c) Swell (d) Blow hole
180. Addition of saw dust to moulding sand increases its
(a) Cohesiveness (b) Gas permeability
(c) Refractoriness (d) All of the above
181. Blow holes in castings are due to
(a) Low permeability of sand
(b) Excessive fine grains and gas producing ingredients
(c) High moisture content of the sand
(d) Any of the above
182. Shell patterns are often used for
(a) Drainage fitting (b) Pipe works
(c) Bends (d) All of the above
183. Chaplets are made of
(a) Metal (b) Wood (c) Core sand (d) Organic matter
184. Shell moulding is uneconomical for
(a) Small scale production (b) Large scale production
(c) Small castings (d) All of the above
185. Design of gate should be such as to
(a) Minimize turbulence and dross formation
(b) Avoid erosion of cores and mould cavity
(c) Prevent scum, slag or eroded sand particles from entering the mould cavity (d) All of the above
186. Amount of coal dust added to moulding sand depends on
(a) Pouring temperature (b) Thickness of casting
(c) Shape of the casting (d) All of the above

187. Sweep patterns used to prepare mould of any of the following shape:
(a) Unsymmetrical and irregular (b) Symmetrical regular
(c) Unsymmetrical regular (d) None of the mentioned shape.
188. Which of the following is an advantage of cold forming?
(a) Relatively small force is required
(b) Strength and hardness are increased
(c) Refinement of grains takes place
(d) No subsequent heat treatment is required
189. Which of the following is the major problem in hot extrusion?
(a) Wear of punch (b) Design of die
(c) Design of punch (d) Wear and tear of die
190. The mould is housed in which of the following?
(a) Flask (b) Drag (c) Cope (d) Pouring basin
191. In the following type of moulding method green sand is generally used:.
(a) Floor (b) Plate (c) Bench (d) Pit
192. The following type of sand mould has good erosion resistance to metal flow and is also collapsible.
(a) Cement bonded (b) Skin dry (c) Green (d) Dry
193. The following types of casting is used to produce ornamental pieces:.
(a) Gravity and semi-permanent mould (b) Pressed and slush
(c) Semi-permanent mould and pressed (d) Slush and gravity
194. Which of the following is the main constituent of moulding sand?
(a) Silica (b) Alumina (c) Iron oxide (d) Clay
195. Silica is
(a) An organic polymer (b) A ceramic material
(c) A metallic alloy (d) A composite material
196. Metal patterns are employed for castings of type:
(a) Precise and intricate (b) Large
(c) Large scale production of small components
(d) Small number of castings
197. The most appropriate binder used in shield moulding process:
(a) Urea (b) Bitumen (c) Carbon disulphide (d) Molasses
198. Which of the following is not a casting defect?
(a) Shift (b) Scab (b) Blow hole (c) Hot tear (d) Decarburisation
199. Hot tear is a
(a) Heat treatment process (b) Fabrication process
(c) Casting defect (d) None of the above
200. In the case of investment casting the material of pattern is
(a) Wax (b) Thermostatic resin
(c) Mercury (d) Synthetic sand

201. By which of the following casting methods are steel and cast iron pipes cast?
(a) Investment casting (b) Continuous casting
(c) Die casting (d) True centrifugal casting.
202. In foundry practice ' drossing' refers to which of the following?
(a) The formation of oxides on the molten metal surface
(b) Improving finish of castings (c) An inspection method for castings
(d) None of the above.
203. What is the function of core points?
(a) To fabricate core (b) To strengthen core (c) To form seat to support and hold the core in place (d) All of the above
204. Where is the match plate pattern used
(a) In machine moulding (b) In bench moulding
(c) In green sand moulding (d) In pit moulding
205. Which of the following is the best suited press for drawing operation?
(a) Toggle press (b) Knuckle joint press
(c) Rack and pinion press (d) None of the above
206. Foundry sands are graded according to their
(a) Source of availability (b) Moisture content
(c) Strength (d) Clay content and grain size
207. In sand casting, the central part of a three-box mould is called as
(a) Cope (b) Drag (c) Cheek (d) Support
208. A green sand
(a) Is green in color (b) Gets green color after pouring the metal
(c) Contains moisture when molten metal is poured
(d) Is used after drying the box
209. The maximum quantity of water in moulding sand is
(a) 5% (b) 8% (c) 12% (d) 15%
210. In sand moulding, the bottommost part is called as
(a) Cope (b) Drag (c) Check (d) Support box
211. Chaplets are used for
(a) Chilling the casting (b) Supporting the core
(c) Directional solidification (d) Controlling the shrinkage
212. Chills are provided at appropriate locations in the mould walls
(a) To increase the freezing rate (b) To decrease the freezing rate
(c)For progressive solidification (d) For directional solidification
213. Riddle is
(a) A round sieve (b) Used for sand preparation
(c)Used for repairing the corners of the mould
(d)Used for cutting the runners
214. The quantity of gas generated in a mould made from synthetic sand as compared to silica sand is
(a) More (b) Less (c) Same (d) Unpredictable

215. Fluidity of metal is greatly influenced by
(a) Carbon content (b) Silicon content
(c) Pouring temperature of molten metal (d) Addition of inoculants
216. The mould is housed in a
(a) Moulding flask (b) Cope (c) Drag (d) Cheek
217. Gate is provided in moulds to
(a) Compensate for shrinkage (b) Avoid cavities
(c) Feed the casting at a constant rate (d) Give passage to gases
218. Lifter is
(a) A round sieve (b) Used for cutting gates
(c) Used to scoop sand deep in the mould
(d) Used to lift sand from floor and pour in moulding box
219. The following is used to prevent the green sand from sticking to the mould
(a) Parting sand (b) Loam sand
(c) Moulding sand (d) Core sand
220. The following type of sand is better for steel castings
(a) Fine grain sand (b) Coarser grain sand
(c) Facing sand (d) Reclaimed sand
221. Loam sand used for making moulds comprises of
(a) 40% clay, 10% moisture (b) 60% clay, 15% moisture
(c) 50% clay, 18% moisture (d) 80% clay, 20% moisture
222. Diameter is used to find out
(a) Hot strength (b) Cold strength
(c) Clay content (d) Compactness
223. In the case of machine moulding, the patterns are mounted on
(a) Moulding table (b) Match plate
(c) Moulding boards (d) Follow boards
224. Sprue in casting refers to
(a) Pattern projections (b) Gate
(c) Horizontal passage (d) Vertical passage
225. Wax pattern is used for making the following type of mould
(a) Centrifugal casting (b) Semi-centrifugal casting
(c) Investment casting (d) Slush moulding
226. The system of manufacturing, in which the dimensions of parts lie within some specified limits, is known as
(a) Mass production system (b) Batch production system
(c) Interchangeable system (d) Group technology
227. In an interchangeable system of manufacturing
(a) Individual fittings take place (b) The components assemble together at random (c) Components can be produced on traditional machines (d) Highly skilled labor is needed to operate the machine

228. Tolerances are specified on components
(a) Because it is not possible to produce the exact size
(b) To obtain desired fits
(c) To have proper allowances
(d) To facilitate inspection

229. In the system of limits and fits, the term allowance refers to
(a) Minimum clearance between shaft and hole
(b) Maximum clearance between shaft and hole
(c) Difference between maximum and minimum size of hole
(d) Difference between maximum and minimum size of shaft

230. Surface roughness on a drawing is represented by
(a) Squares (b) Circles (c) Triangles (d) Dots

231. The system of expressing the size as $25.4^{-0.05}$ mm is known as
(a) Unilateral tolerance system (b) Bilateral tolerance system
(c) Limiting dimension system (d) Universal tolerance system

232. The system of expressing the size as $25.4^{+0.00}_{-0.20}$ mm is known as
(a) Unilateral dimension system (b)Bilateral dimension system
(c) Limiting dimension system (d)Universal dimension system

233. The procedure of expressing a dimension as $\frac{25.4}{25.2}$ is known as
(a) Unilateral dimension system (b) Bilateral dimension system
(c) Limiting dimension system (d) Indian dimension system

234. A dimension is expressed as $50^{+0.5}_{-0.3}$. The basic size is
(a) 50.05 mm (b) 50 mm (c) 49.97 mm (d) 50.03 mm

235. The quality of surface finish depends on
(a) Machining operation (b) Tool geometry
(c) Interface friction (d) All of the above

236. Hot chisel is made from
(a) 4% nickel (b) 4% chromium
(c) 4% tungsten (d) 4% vanadium

237. The thin radial mark extending from the pith to the cambium layer, is called
(a) Bark (b) Cortex (c) Heart wood (d) Medullary rays

238. The purpose of seasoning of wood is to
(a) Reduce the voids (b) Remove the curves
(c) Reduce the moisture content (d) Change the direction of grains

239. The tensile strength of wood is
(a) Maximum in the direction parallel to the grains
(b) Minimum in the direction parallel to the grains
(c) Maximum in the direction across the grains
(d) Same in all the directions

240. The age of a tree can be estimated by the
(a) Diameter of the bark (b) Height of the tree
(c) Number of annular rings (d) None of these
241. The defect caused by imperfect seasoning is called
(a) Wet rot (b) Dry rot (c) Honeycombing (d) Case hardening
242. The mortise gauge is a
(a) Striking tool (b) Planning tool (c) Boring tool (d) Marking tool
243. The sharpening angle of chisels is
(a) 20^0 to 25^0 (b) 25^0 to 30^0 (c) 30^0 to 35^0 (d) 35^0 to 40^0
244. The drawing down is a process of
(a) Increasing the cross-section of a bar
(b) Reducing the cross-section of bar
(c) Joining the two surfaces of metal under pressure after heating
(d) Bending of a bar
245. Slip gauges are generally made of:
(a) Alloy steel (b)Cast Iron
(c) Bronze (d)Duralumin
246. Clearance fit is the conditions
(a) There is positive allowance between largest possible shaft and smallest possible hole.
(b) There is negative allowance between largest possible shaft and smallest possible hole.
(c) There is no clearance between the two.
(d) None of the above.
247. Linear measurement is considered very precise, if
(a) Steel rule is used (b) Outside caliper is used
(c) Micrometer is used (d) The transfer caliper is used
248. For angular measurement the following gadget can be used
(a) Protractor (b) Dial indicator (c) Vernier Caliper (d) Depth gauge
249. Surface measurement can not be used by using
(a) Straightedge (b) Profilometer (c) Plug gauge (d) Spirit level
250. Control charts for attribute is concerned with
(a) Qualitative checking of defects
(b) Direct measurement of the variable for control
(c) Checking if the variable is out of control
(d) Actual measurement of the parameter, comparing with a standard

Answers to Objective Type Questions

1.a	2.c	3.b	4.b	5.b	6.a	7.c	8.b	9.c	10.a
11.b	12.b	13.c	14.d	15.a	16.a	17.c	18.c	19.d	20.b
21.d	22.c	23.a	24.c	25.b	26.b	27.a	28.b	29.d	30.c
31.b	32.d	33.b	34.a	35.c	36.d	37.b	38.c	39.c	40.d
41.a	42.c	43.a	44.b	45.b	46.c	47.c	48.b	49.c	50.b
51.d	52.b	53.b	54.b	55.c	56.c	57.d	58.c	59.b	60.c
61.c	62.d	63.c	64.c	65.b	66.d	67.d	68.a	69.c	70.d
71.d	72.b	73.c	74.b	75.a	76.b	77.d	78.b	79.a	80.d
81.d	82.c	83.c	84.d	85.d	86.d	87.d	88.d	89.d	90.d
91.b	92.b	93.b	94.c	95.b	96.b	97.b	98.b	99.c	100.b
101.b	102.d	103.b	104.a	105.a	106.d	107.c	108.c	109.c	110.c
111.c	112.c	113.d	114.d	115.b	116.b	117.d	118.c	119.a	120.a
121.a	122.d	123.c	124.a	125.d	126.a	127.b	128.a	129.b	130.c
131.d	132.d	133.d	134.d	135.b	136.b	137.a	138.a	139.b	140.a
141.c	142.b	143.c	144.a	145.c	146.b	147.d	148.a	149.b	150.c
151.d	152.a	153.a	154.d	155.c	156.b	157.c	158.c	159.d	160.c
161.c	162.c	163.b	164.a	165.d	166.c	167.a	168.d	169.a	170.d
171.a	172.c	173.b	174.c	175.b	176.a	177.b	178.d	179.c	180.b
181.d	182.d	183.a	184.a	185.d	186.b	187.b	188.b	189.d	190.a
191.d	192.b	193.b	194.a	195.b	196.c	197.a	198.d	199.c	200.a
201.d	202.a	203.c	204.a	205.a	206.d	207.c	208.c	209.b	210.b
211.b	212.d	213.a	214.b	215.c	216.a	217.c	218.c	219.a	220.b
221.a	222.a	223.b	224.d	225.c	226.c	227.b	228.a	229.a	230.c
231.a	232.a	233.c	234.b	235.d	236.c	237.d	238.c	239.a	240.c
241.c	242.d	243.c	244.b	245.a	246.a	247.c	248.a	249.c	250.a

APPENDIX – I

CONVERSION FACTORS

LENGTH

1 m = 10^3 mm = 10^4 cm = 10^{-3} kilometre = 10^6 microns = 10^9 nanometres = 10^{10} Angstrom (Å) = 10^{16} fermi = 39.37 in = 3.28 ft = 1.094 yd.

1 cm = 10^4 microns = 10^7 nanometers = 10^8 Å

1 inch = 25.4 mm = 2.54 cm = 0.0254 m = 1000 mil (1 mil = 0.001 in)

1 micron (μ) = 1 μm = 10^{-6} metre = 10^{-3} millimeter.

FORCE

1 N (newton) = 10^{-3} sthene = 10^5 dynes = 0.102 kgf = 0.225 lbf.

1 lbf = 0.454 kgf = 454 gf = 4.45 N = 4.45×10^5 dyne.

1 dyne = 10^{-5} N = 0.102×10^{-5} kgf = 0.225×10^{-5} lbf.

1 kgf = 10^3 gf = 221 lbf = 9.81 N = 9.81×10^5 dyne = 10^{-3} tonne force.

STRESS : PRESSURE

1 N/m^2 = 1 pascal (pa) = 1.02 kgf/mm^2 = 1.45×10^{-4} psi = 10 dyne/cm^2

1 kgf/mm^2 = 9.81×10^6 N/m^2 = 1.426×10^3 psi = 9.81×10^7 dyne/cm^2

1 psi = 6.89×10^3 N/m^2 = 7.02×10^{-4} kgf/mm^2 = 6.89×10^4 dyne/cm^2

1 atm = 760 mm of Hg = 1.01×10^5 N/m^2 = 1.03×10^{-2} kgf/mm^2

WORK AND ENERGY

1 Joule (J) = 1 N.m = 1 W.s = 10^7 erg = 0.239 cal = 0.625×10^{12} eV

1 eV/molecule = 1.602×10^{-19} J = 1.602×10^{-12} erg = 23×10^3 cal/mol

1 cal = 4.18 J = 4.18×10^7 erg = 2.62×10^{19} eV

1 erg = 10^{-7} J = 0.239×10^{-7} cal = 0.625×10^{19} eV

1 hph = 27×10^4 kgfm = 632 kcal = 2.65×10^6 J

1 kWh = 3671×10^2 kgfm = 860 kcal = 3.6 MJ

1 kgfm = 9.81 J

SPECIFIC HEAT CAPACITY

1 J/kg K = 10^4 erg/g °C = 0.239×10^{-3} kcal/kg °C

1 kcal/kg °C = 1 cal/g °C = 4.19×10^7 erg/g °C = 4.19×10^3 J/kg K

1 J/m^3 K = 0.239×10^{-3} kcal/m^3 °C

OTHERS

1 gauss = 10^{-4} weber/m^2 = 10^{-4} tesla (T)

1debye = 0.33×10^{-29} coul.m

1 oersted = 76.6 amp-turn/m

1 gauss/oersted = 79.6×10^{-4} henry/m

APPENDIX – II

TOLERANCE GRADE AND SURFACE ROUGHNESS FOR DIFFERENT MANUFACTURING PROCESSES

Sl No	*Manufacturing Processes*	*IT grade*	*Surface roughness in microns*
1.	Lapping	4 and 5	0.012 to 0.016
2.	Honing	4 and 5	0.025 to 0.40
3.	Cylindrical grinding	5 to 7	0.063 to 5
4.	Surface grinding	5 to 8	0.063 to 5
5.	Broaching	5 to 8	0.40 to 3.2
6.	Reaming	6 to 10	0.40 to 3.2
7.	Turning	7 to 13	0.32 to 25
8.	Hot rolling	8 to 10	2.5 to 50
9.	Extrusion	8 to 10	0.16 to 5
10.	Boring	8 to 13	0.40 to 6.3
11.	Milling	10 to 13	0.32 to 25
12.	Planing and shaping	10 to 13	1.6 to 25
13.	Drilling	10 to 13	1.6 to 25
14.	Die casting	12 to 14	5 to 50
15.	Sand casting	14 to 16	0.80 to 3.20
16.	Forging	14 to 16	1.60 to 2.5

APPENDIX – III

EXTRACT FROM THE TABLE OF ELEMENTS

Element	*Symbol*	*Atomic weight*	*Melting point in °C*
Aluminium	Al	26.97	658.7
Antimony	Sb	121.77	630
Argon	Ar	39.94	– 188
Arsenic	As	74.96	850
Beryllium	Be	9.02	1280
Bismuth	Bi	208.98	271
Boron	B	10.82	2200–2500
Cadmium	Cd	112.41	320.9
Calcium	Ca	40.07	810
Carbon	C	12.01	3600
Chlorine	Cl	35.45	– 101.5
Chromium	Cr	52.01	1615
Cobalt	Co	58.94	1480
Copper	Cu	63.57	1083
Fluorine	F	19.0	– 223
Gold	Au	197.2	1063
Helium	He	4.0	– 272
Hydrogen	H	1.0078	– 259
Iron	Fe	55.84	1530
Lead	Pb	207.22	327.4
Magnesium	Mg	24.32	651
Manganese	Mn	54.93	1230
Mercury	Hg	200.61	– 38.87
Molybdenum	Mo	95.97	2620
Neon	Ne	20.18	– 253
Nickel	Ni	8.69	452
Niobium (Columbium)	Nb (Cb)	92.9	1950
Nitrogen	N	14.008	– 210
Oxygen	O	16.00	– 218
Phosphorus	P	30.98	44
Platinum	Pt	195.23	1755
Potassium	K	39.1	62.3
Silicon	Si	28.06	1420
Silver	Ag	107.88	960.5
Sodium	Na	22.99	97.5
Sulphur	S	32.06	112.8
Thorium	Th	232.12	1700
Tin	Sn	118.70	231.9
Titanium	Ti	47.9	1800
Tungsten	W	184.0	3400
Uranium	U	238.14	1850
Vanadium	V	50.96	1720
Xenon	Xe	131.3	– 140
Zinc	Zn	65.38	419.4
Zirconium	Zr	91.22	1700

APPENDIX – IV

THE PATTERN COLOUR SCHEME RECOMMENDED BY IS : 1513–1971

Surface	*Colour/Mark*
Surface to be left as unmachined :	Blue (steel) Red (Grey cast iron) Grey (Malleable cast iron) Orange (Heavy metal castings) Brown (Light metal castings)
Surface to be machined :	Yellow
Coreprints for unmachined opening and end prints :	
Periphery	Black
Ends	Black
Coreprints and machined openings :	
Periphery	Yellow strips or black
Ends	Black
Pattern joints (split pattern) :	
Cored section	Black
Metal section	Clear varnish
Touch core :	
Core shape	Black
Legend	"Touch"
Seats of and for loose coreprints :	Green
Stop–offs :	Diagonal black strips or clear varnish
Chilled surfaces :	
Outlined in legend	Black "chill"
Fillets :	Black broken line

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