

TEST (iii) PART -- (A) GENERAL ENGINEERING  
(CIVIL AND STRUCTURAL)

CIVIL

101. To measure static pressure in a pipe, one uses a pressure guage connected to a :
- (A) Pilot tube
  - (B) Venturimeter
  - ☒ (C) Orificemeter
  - (D) Pictometer Tapping
102. Resins are :
- ☒ (A) not soluble in water
  - (B) soluble in spirit
  - (C) used in varnishes
  - (D) left behind on evaporation of oil
103. The flow in open channel is turbulent if the Reynolds Number is :
- (A) 2000
  - ☒ (B) more than 2000
  - (C) more than 4000
  - (D) 4000
104. A submerged weir is one in which the water level on the down streams side of the weir is :
- (A) just at the crest level
  - (B) below the crest level
  - ☒ (C) above crest level
  - (D) at same elevation as water surface on upstream
105. Uniformity coefficient of a soil is :
- (A) always less than 1
  - (B) always equal to 1
  - ☒ (C) equal to or less than 1
  - (D) equal to or greater than 1
106. Flow of fluid takes place due to its :
- (A) Viscosity
  - (B) Compressibility
  - (C) Surface tension
  - (D) Deformation under shear force
107. The difference between face left and face right observation of a theodolite is 3'. The error is :
- ☒ (A) 45"
  - (B) 1' 30"
  - (C) 3'
  - (D) 0'
108. Dry rot :
- (A) cracks the timber
  - (B) reduces the timber to powder
  - ☒ (C) reduces the strength of timber
  - (D) shrinks the timber
109. The magnitude of the buoyant force can be determined by :
- (A) Newton's law of viscosity.
  - (B) Archimede's principle.
  - (C) Principles of moments
  - (D) none of the above

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G.K. - 50 - 25  
Reason - 50 - 45  
Total - 100 - 60  
130



110. Quick sand is a :
- (A) type of sand
  - (B) flow condition occurring in cohesive soil
  - (C) flow conditions occurring in cohesionless soils
  - (D) all the above
111. The pitot tube is used to measure :
- (A) Velocity at stagnation point.
  - (B) Stagnation pressure.
  - (C) Static pressure.
  - (D) Dynamic pressure.
112. Cross hairs in surveying telescopes, are fitted :
- (A) in the objective lens
  - (B) at the center of the telescope
  - (C) at the optical centre of the eye piece
  - (D) in front of the eyepiece
113. Standard penetration resistance in very stiff clays lies between :
- (A) 2 and 4
  - (B) 4 and 8
  - (C) 8 and 15
  - (D) 15 and 30
114. Rocks having alumina or clay as their major constituent are called :
- (A) Silicious rocks
  - (B) Argillaceous rocks
  - (C) Sedimentary rocks
  - (D) None of the above
115. A manhole is generally provided at each :
- (A) Bend
  - (B) Junction
  - (C) Change of gradient
  - (D) All the above
116. For determining the ultimate bearing capacity of soil the recommended size of square bearing plate used in Plate load test is 30 – 75cm with a minimum thickness of :
- (A) 20 mm
  - (B) 5 mm
  - (C) 50 mm
  - (D) None of the above
117. Plywood is obtained by gluing wooden sheets at a pressure of :
- (A) 100 to 150 N/cm<sup>2</sup>
  - (B) 100 to 130 N/cm<sup>2</sup>
  - (C) Both (A) and (B)
  - (D) Neither (A) nor (B)
118. The moisture content of a soil, below which the soil volume becomes constant, is called the :
- (A) liquid limit
  - (B) plastic limit
  - (C) shrinkage limit
  - (D) none of the above

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0.7 - 1.4 N/mm<sup>2</sup>  
70 - 140



119. The maximum permissible limit for fluoride in drinking water is :

- (A) 0.1 mg/l
- ☒ (B) 1.5 mg/l
- (C) 5 mg/l
- (D) 10 mg/l

120. If the diameter of a capillary tube is doubled, the capillary rise will be :

- ☒ (A) unaffected
- (B) doubled
- (C) halved
- (D) none of the above

121. The relation between coefficient of consolidation  $C_v$ , time factor  $T_v$ , drainage path  $d$  and time  $t$ , is given by :

☒ (A)  $C_v = \frac{d^2 T_v}{t}$

☒ (B)  $C_v = \frac{d^2 t}{T_v}$

(C)  $C_v = \frac{t \cdot T_v}{d^2}$

(D)  $C_v = \frac{T_v}{t \cdot d^2}$

122. The 'fix' of a plane table from three known points, is good, if :

- ☒ (A) middle station is nearest
- (B) middle station is farthest
- (C) either the right or left station is nearest
- (D) none of these

123. Bernoulli's theorem deals with the law of conservation of:

- ☒ (A) mass
- (B) momentum
- (C) energy
- (D) none of the above

124. In levelling operation :

- (A) The first sight on any change point is a back sight
- (B) The second sight on any change point is a fore sight
- (C) The line commences with a fore sight and closes with a back sight
- ☒ (D) The line commences with a back sight and closes with a fore sight.

125. Bitumen emulsion is :

- ☒ (A) a liquid containing bitumen in suspension
- (B) a paint
- (C) used as anti-corrosive paint
- (D) all the above

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$T_v = \frac{C_v t}{d^2}$



126. Undisturbed samples are obtained by :

- (A) direct excavations
- (B) thin walled samplers
- (C) thick walled samplers
- (D) none of the above

127. The shearing strength of a cohesion less soil depends on :

- (A) Dry density
- (B) Rate of loading
- (C) Confining pressure
- (D) All the above

128. Primary treatment of sewage consist of :

- (A) Removal of floating materials
- (B) Removal of sand and grit
- (C) Removal of organic materials
- (D) All the above

129. The commonly used lime in white washing is :

- (A) Quick lime
- (B) Fat lime
- (C) Hydraulic lime
- (D) All the above

130. The distribution system in water supplies is designed on the basis of :

- (A) average daily demand
- (B) peak hourly demand
- (C) coincident of draft
- (D) greater of (B) and (C)

131. The size of modular bricks are :

- (A)  $10 \times 10 \times 9$  cm
- (B)  $19 \times 9 \times 9$  cm
- (C)  $22.5 \times 10 \times 8.5$  cm
- (D)  $22.5 \times 8.0 \times 9$  cm

132. The ratio of liquid limit to plasticity index for a soil mass is called :

- (A) liquidity index
- (B) shrinkage ratio
- (C) consistency index
- (D) none of the above

133. The detention period for oxidation ponds is usually kept as :

- (A) 4 - 8 hours
- (B) 24 hours
- (C) 10 to 15 days
- (D) 3 months

134. The moisture content in a well seasoned timber is :

- (A) 5 to 10 %
- (B) 10 to 12 %
- (C) 12 to 15 %
- (D) 30 to 50 %

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135. Good quality cement contains higher percentage of :

- ☒ (A) Tricalcium Silicate
- (B) Tricalcium Aluminate
- (C) Dicalcium Silicate
- (D) None of the above

136. Cross staff is used for :

- (A) setting out right angles
- ☒ (B) measuring horizontal angles
- (C) both (A) and (B)
- (D) none of the above

137. The accuracy of measurement in chain surveying, does not depend upon :

- (A) length of the offset
- (B) scale of the plotting
- (C) importance of the features
- ☒ (D) general layout of the chain lines

138. Sand stone is :

- ☒ (A) Sedimentary rock
- (B) Metamorphic rock
- (C) Igneous rock
- ☒ (D) Volcanic rock

139. Airvalves in a distribution system are provided at :

- (A) Dead ends in the water distribution system
- (B) Junction of main and branch pipes
- ☒ (C) Summit points on water mains
- (D) Places where the pressure is minimum

140. Age of a tree may be ascertained by :

- (A) radius of its stem
- ☒ (B) circumference of its stem
- (C) number of branches
- ☒ (D) number of annual rings

141. Nitrates more than 45 mg/l in water lead to disease called :

- (A) Gastroenteritis
- (B) Mottled teeth
- (C) Polio
- ☒ (D) None of the above

142. Crushing strength of good building stone should be more than :

- (A) 500 kg/cm<sup>2</sup>
- ☒ (B) 1000 kg/cm<sup>2</sup>
- (C) 1400 kg/cm<sup>2</sup>
- (D) 2000 kg/cm<sup>2</sup>

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143. The coefficient of curvature for a well graded soil must be in the gauge :

- (A) 0.5 - 1.0
- (B) 3.0 - 4.0
- (C) 4.0 - 5.0
- (D) None of the above

144. The commonly used thinner in oil paints, is :

- (A) naptha
- (B) turpentine
- (C) both (A) and (B)
- (D) neither (A) nor (B)

145. The minor loss due to sudden contraction is due to :

- (A) flow contraction
- (B) expansion of flow after sudden contraction
- (C) cavitation
- (D) boundary friction

146. The main ingredients of Portland cement are :

- (A) lime and silica
- (B) lime and alumina
- (C) silica and alumina
- (D) all the above

147. For a tachometer the additive and multiplying constants are :

- (A) 0 and 100
- (B) 100 and 0
- (C) 0 and 0
- (D) 100 and 100

148. The bubble tube parallel to the telescope of a theodolite should be more sensitive, since it controls :

- (A) vertical axis
- (B) horizontal axis
- (C) axis of bubble tube
- (D) none of the above

149. A sewer which receives the discharge of a number of house sewers is called :

- (A) house sewer
- (B) lateral sewer
- (C) intercepting sewer
- (D) sub-main sewer

150. Coefficient of earth pressure at rest is given by :

- (A)  $\frac{\mu^2}{1-\mu^2}$
- (B)  $\frac{\mu}{1-\mu}$
- (C)  $\frac{1-\mu}{\mu}$
- (D)  $\frac{1-\mu^2}{\mu^2}$



TEST (iii) PART - (A) GENERAL ENGINEERING  
(CIVIL AND STRUCTURAL)  
STRUCTURAL

151. Ductility of which of the following is the maximum ?  
 (A) Mild steel  
 (B) Cast iron  
 (C) Wrought iron  
 (D) Pig iron
152. The operation of removing humps and hollows of uniform concrete surface, is known as :  
 (A) floating  
 (B) screeching  
 (C) trowelling  
 (D) finishing
153. The type of weld used to connect two plates at a lap joint is called :  
 (A) Butt weld  
 (B) Slot weld  
 (C) Plug weld  
 (D) Fillet weld
154. Additional cover thickness in reinforced cement concrete members totally immersed in sea water is :  
 (A) 25 mm  
 (B) 30 mm  
 (C) 35 mm  
 (D) 40 mm
155. The minimum thickness of a reinforced concrete wall should be :  
 (A) 7.5 cm  
 (B) 10 cm  
 (C) 15 cm  
 (D) 12.5 cm
156. In a cantilever retaining wall, the stem design moment is :  
 (A)  $K_a \gamma h^2/2$   
 (B)  $K_a \gamma h$   
 (C)  $K_a \gamma h^3/6$   
 (D)  $K_a \gamma h^3/12$
157. For a rivet of 36 mm diameter, the diameter of hole shall be taken as :  
 (A) 37.5 mm  
 (B) 36.0 mm  
 (C) 38.0 mm  
 (D) 38.5 mm
158. What should be multiplied with permissible bearing stress to find out strength of rivet in bearing ?  
 (A)  $(p-d) t$   
 (B)  $\frac{\pi}{4} d^2$   
 (C)  $\frac{\pi}{2} d^2$   
 (D)  $d.t^2$

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159. A simply supported beam is considered as a deep beam if the ratio of effective span to overall depth is less than :

- (A) 1
- (B) 4
- (C) 3
- (D) 2

160. Standard loads are given in :

- (A) IS 885
- (B) IS 1375
- (C) IS 675
- (D) IS 875

161. A reinforced concrete beam, supported on columns at ends, has a clear span 5m, and 0.5m effective depth. It carries a total uniformly distributed load 100 kN/m. The design shear force for the beam is :

- (A) 250 kN
- (B) 200 kN
- (C) 175 kN
- (D) 150 kN

162. Slump test is used for :

- (A) strength
- (B) durability
- (C) workability
- (D) consistency

163. Minimum pitch of rivets should not be less than how many times of gross diameter of rivet ?

- (A) 2 times
- (B) 2.5 times
- (C) 3 times
- (D) 4 times

164. strain energy stored in a solid is given as

- (A)  $\sigma \times \epsilon \times \text{volume}$
- (B)  $\sigma \times \epsilon \times \text{area of cross section}$
- (C)  $0.5 \times \sigma \times \epsilon \times I$
- (D)  $0.5 \times \sigma \times \epsilon \times \text{volume}$

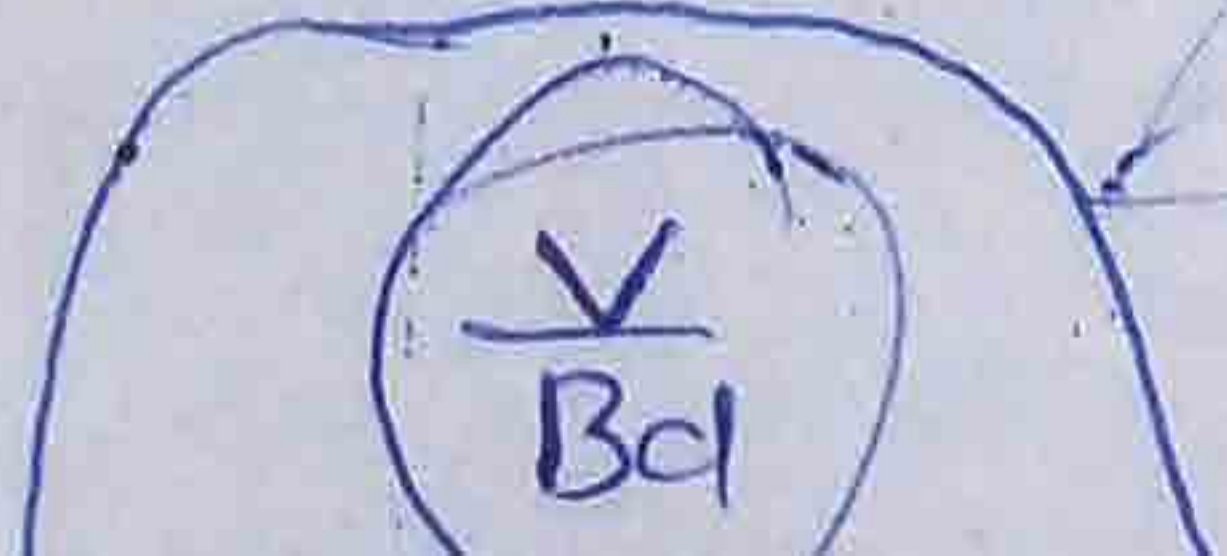
165. Shrinkage in concrete can be reduced by using :

- (A) low water cement ratio
- (B) less cement in the concrete
- (C) proper concrete mix
- (D) all the above

166. Section modulus for a rectangular section is given as :

- (A)  $bd^2/36$
- (B)  $bd^3/6$
- (C)  $bd^2/6$
- (D)  $bd^3/12$

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$l = 5m$   $d = 0.5$

$w = 100kN/m$

$\frac{bd^3}{12} = \frac{bd^2}{2}$



167. For a beam, the term  $M/EI$  is :

- (A) stress
- (B) rigidity
- (C) curvature
- (D) shear force

168. In a cantilever beam, main reinforcement is provided :

- (A) above the neutral axis
- (B) as vertical stirrups
- (C) as helical reinforcement
- (D) below the neutral axis

169. The characteristic strength of concrete in the actual structure is taken as :

- (A)  $f_{ck}$
- (B)  $0.85 f_{ck}$
- (C)  $0.67 f_{ck}$
- (D)  $0.447 f_{ck}$

170. Water required per bag of cement, is

- (A) 7 kg
- (B) 14 kg
- (C) 28 kg
- (D) 35 kg

171. Characteristic strength of concrete is measured at :

- (A) 14 days
- (B) 28 days
- (C) 91 days
- (D) 7 days

172. Pick the wrongly written assumption taken in analysis of rivetted joints.

- (A) Friction in plates is negligible
- (B) Uniform stress distribution in plates is not considered
- (C) Bending moment is not taken into consideration
- (D) Total load on the joint is equally shared by all rivets

173. The shear stress distribution over a beam of solid circular section is such that :

- (A)  $q_{max} = 2q_{mean}$
- (B)  $q_{max} = 1.5 q_{mean}$
- (C)  $q_{max} = 1.33 q_{mean}$
- (D)  $q_{max} = 1.25 q_{mean}$

$q_{max} = 1.5 q_{mean}$   
 $= \frac{4}{3} (C/P)$

174. Euler's formula is valid for :

- (A) short columns only
- (B) long columns only
- (C) both short and long columns
- (D) none of the above



175. The value of ultimate creep coefficient for concrete :

- (A) increases with age of loading
- (B) decreases with age of loading
- (C) remains constant
- (D) is taken as 0.0003

176. If lines of action of forces in a system of forces meet at a point then these forces are called as :

- (A) parallel forces
- (B) non-concurrent forces
- ☒ (C) concurrent forces
- (D) resultant forces

177. Partial safety factors for concrete and steel respectively may be taken as :

- ☒ (A) 1.5 and 1.15
- (B) 1.5 and 1.78
- (C) 3 and 1.78
- (D) 3 and 1.2

178. Bulking of sand is :

- (A) less in fine sand
- (B) more in coarse sand
- (C) more in medium sand
- ☒ (D) more in fine sand

179. Minimum thickness of main steel members, not exposed to weather, is :

- (A) 4.5 mm
- ☒ (B) 6.0 mm
- (C) 8.0 mm
- (D) 8.5 mm

180. A pre-cast pile generally used is :

- ☒ (A) circular
- (B) square
- (C) octagonal
- (D) square with corners chamfered

181. Pozzolana are rich in :

- (A) silica
- ☒ (B) silica and alumina
- (C) silica, alumina and alkali
- (D) silica, alumina, alkali and iron

182. Relation between Young's modulus (E) and modulus of rigidity (N) is given as

- (A)  $E = 3N(1 + \nu)$
- (B)  $E = 2N(1 - \nu)$
- (C)  $E = 2N(1 + \nu)$
- (D)  $E = 3N(1 - 2\nu)$

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$E = \frac{9kG}{3kG + 4G}$



183. Maximum value of slenderness ratio of lacing flats in a steel column is :

- (A) 120
- ☒ (B) 145
- (C) 180
- (D) 320

184. A column is a compression member, the effective length of which exceeds three times of its least lateral dimension. This is applicable to :

- ☒ (A) rectangular and circular sections
- (B) I section and circular section
- (C) rectangular, circular and I sections
- (D) all the shapes of sections.

185. Tension bars in a cantilever beam must be enclosed in the support up to :

- (A)  $L_d$
- (B)  $L_d/3$
- ☒ (C)  $12\phi$
- (D)  $d$

186. For a fixed support in a plane structure, total number of reactions is :

- (A) 1
- (B) 2
- ☒ (C) 3
- (D) 4

187. According to IS : 456 - 2000, the maximum reinforcement in a column is :

- (A) 4%
- (B) 2%
- ☒ (C) 6%
- (D) 8%

188. The minimum grade of reinforced concrete in sea water as per IS 456 : 2000 is :

- (A) M 15
- (B) M 20
- ☒ (C) M 30
- (D) M 40

189. Effective throat thickness ( $t$ ) and size of weld ( $s$ ) are connected as :

- (A)  $t = k s^2$
- (B)  $t = k s^3$
- (C)  $t = k s$
- (D)  $t = k \sqrt{s}$

$$t = 0.4 J_d$$

190. Which of the following method may be used for getting a more workable concrete ?

- (A) by increasing cement content
- (B) by decreasing water cement ratio
- (C) by using angular aggregates in place of rounded ones.
- ☒ (D) by reducing the size of aggregates



191. The characteristic strength of concrete is defined as that strength below which not more than 5% of the test results are expected to fall.
- (A) 10 percent  
(B) 5 percent ✓  
(C) 15 percent  
(D) 20 percent
192. The minimum head room over a stair must be :
- (A) 200 cm ✓  
(B) 205 cm  
(C) 210 cm  
(D) 220 cm ✓
193. A rivetted joint can fail in :
- (A) tearing of plate only  
(B) shearing of rivet only  
(C) bearing of plate or rivet only  
(D) any of the above ✓
194. The limit to Poisson's ratio is : *It can be negative at dt*
- (A) 0.25 ✓  
(B) 0.15  
(C) 0.50 ✓  
(D) 0.65
195. Shear reinforcement is provided in the form of :
- (A) vertical bars ✓  
(B) inclined bars ✓  
(C) combination of vertical and inclined bars ✓  
(D) any one of the above ✓
196. The purpose of lateral ties in short concrete columns is :
- (A) to avoid buckling of longitudinal bars  
(B) to facilitate construction  
(C) to facilitate compaction of concrete  
(D) to increase the load carrying capacity ✓
197. Shape factor for a circular section is equal to :
- (A) 1.00  
(B) 1.50  
(C) 2.34 ✓ *Rectangle*  
(D) 1.70 ✓ *Circle*
198.  $EI (d^3y/dx^3)$  for a beam represents :
- (A) deflection  
(B) slope  
(C) moment  
(D) shear ✓
199. In ordinary portland cement, the first one to react with water is :
- (A)  $C_3A$  ✓  
(B)  $C_2S$   
(C)  $C_3S$   
(D)  $C_4AF$
200. Bolts are most suitable to carry
- (A) shear  
(B) bending  
(C) axial tension  
(D) shear and bending ✓

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