

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

SPACE FOR ROUGH WORK

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

*τ = c + σ tan φ*  
*τ = 6 tan φ*

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 — *white washing*
- (C) Hydraulic lime — *mortar*
- (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

*Ip > Iu =*

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

$$\frac{W_L - W_p}{I_p}$$

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

*Primary sedimentation*  
*Coagulation*

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

1/2 cc L 3

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

- (A) naphtha
- (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)  $\frac{1-\mu^2}{\mu^2}$

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TEST (iii) PART - (A) GENERAL ENGINEERING  
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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)  $d \cdot t^2$
- Handwritten notes on the right side of the page:  
 $1.5 \leq 25 \text{ mm}$   
 $27 - 25 \text{ mm}$

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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)  $0.5 \times \sigma \times \epsilon \times \text{volume}$

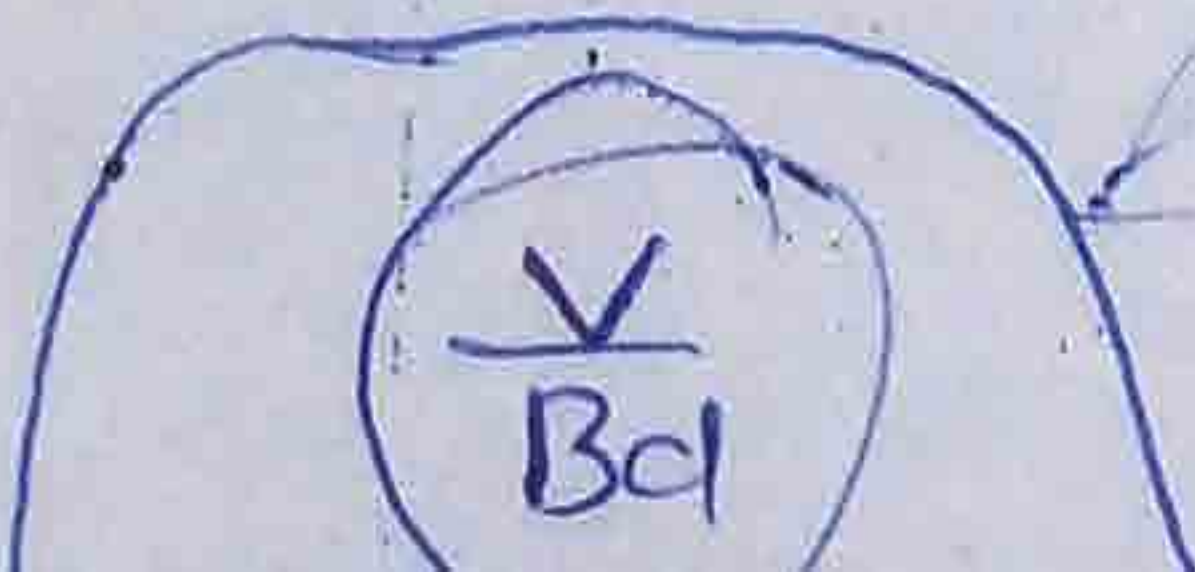
165. Shrinkage in concrete can be reduced by using :

- (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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$l = 5m$   $d = 0.5$

$w = 100KN/m$





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)  $q_{max} = 1.25 q_{mean}$

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

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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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 :

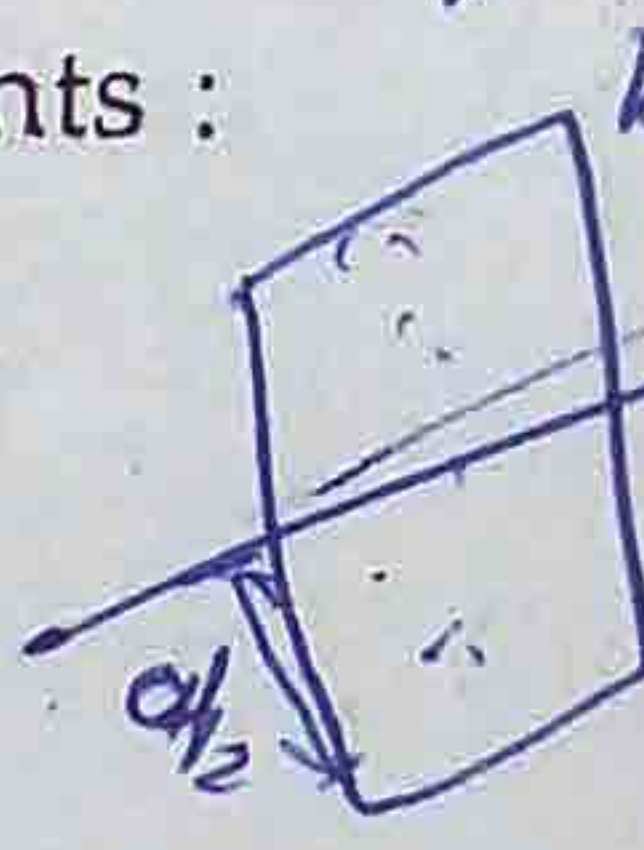
- (A) M 15
- (B) M 20
- (C) M 30
- (D) M 40

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)  $t = k \sqrt{s}$

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 ✓
- इसके कारण यह नकारात्मक है ✓
194. The limit to Poisson's ratio is :
- (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 — Rectangular ✓  
 (B) 1.50 — Trapezoidal ✓  
 (C) 2.34 — Trapezoidal ✓  
 (D) 1.70 — Circular ✓
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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