SSC JE General Engineering Civil Question Paper with Answer Key

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Hope following Model Question Paper, Sample paper may be helpful in the preparation of Civil and Structural engineering examination of junior engineer posts.
Written examination for Junior engineer posts will be held on : 6 December 2015

TEST (iii)

PART A : GENERAL ENGINEERING

(CIVIL AND STRUCTURAL)

101. A linear force-deformation relation is obtained in materials

(A) having elastic stress-strain property

(B) having plastic stress-strain property

(C) following Hooke's law

(D) which are rigid elastic materials

102. The property of a material by which it can be beaten or rolled into plates, is called

(A) malleability

(B) ductility

(C) plasticity

(D) elasticity

103. In a cantilever beam subjected to general loading, the maximum bending moment is at

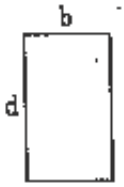
(A) fixed end

(B) free end

(C) mid-span

(D) quarter-span

104.



Moment of inertia of rectangular section shown in Fig. about its horizontal centroidal axis is

(A) $db^3/12$ (B) $db^3/3$

(C) $bd^3/12$ (D) $bd^3/3$

105. Ratio of length of column to the minimum radius of gyration of the cross-sectional area of the column is known as

(A) Slenderness ratio

(B) Buckling ratio

(C) Crippling ratio

(D) Compressive ratio

106. The top diameter, bottom diameter and the height of the steel mould used for slump test are

(A) 10 cm, 20 cm, 30 cm

(B) 10 cm, 30 cm, 20 cm

(C) 20 cm, 10 cm, 30 cm

(D) 20 cm, 30 cm, 10 cm

107. The early high strength of rapid hardening cement is due to its

(A) increased content of gypsum

(B) burning at high temperature

(C) increased content of cement

(D) higher content of tricalcium

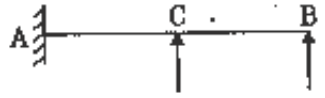
108. Which of the beams given in the following Figs. is a determinate beam ?

(A)

(B)

(C)

(D)



109. The effective slenderness ratio of a cantilever column is

(A) $0.5\,L/r$ (B) L/r

(C) $\sqrt{2}\,L/r$ (D) $2\,L/r$

110. If the area of tension reinforcement provided is less than that required for a balanced section, then the RCC beam is called

(A) over reinforced

(B) neutral reinforced

(C) under reinforced

(D) bottom reinforced

111. Workability of concrete for a given water content is good if the aggregates are

(A) angular aggregates

(B) flaky aggregates

(C) rounded aggregates

(D) irregular aggregates

112. Generally, strength of concrete is considered negligible/very low in

(A) Compression (B) Tension

(C) Fatigue (D) None of the above

113. As the cement sets and hardens, it generates heat. This is called

(A) Heat of hydration

(B) Latent heat

(C) Heat of vaporisation

(D) Sensible heat

114. In concrete, while hand mixing is adopted, excess cement to be added is

(A) 4% (B) 10%

(C) 14% (D) 20%

115. For constructing road pavements, the type of cement generally used is

(A) ordinary Portland cement

(B) rapid hardening cement

(C) low heat cement

(D) blast furnace slag cement

116. A very comfortable type of stair for usage is

(A) straight (B) dog legged

(C) open newel (D) circular

117. A T-beam behaves as a rectangular beam of a width equal to its flange if its neutral axis

(A) falls within the flange

(B) falls below the flange

(C) coincides with the geometrical centre of the beam

(D) falls below the centroidal axis of the beam

118. If τ_v is the nominal shear stress, τ_c is design shear strength of concrete and $\tau_{c,\,max}$ is the maximum design shear strength of concrete, which of the following statements is correct ?

(A) If $\tau_v > \tau_{c,\,max}$, section is to be designed for shear.

(B) If $\tau_v > \tau_{c,\,max}$, minimum shear reinforcement is to be provided.

(C) If $\tau_v < \tau_c$, minimum shear reinforcement is to be provided.

(D) If $\tau_v > \tau_c$, minimum shear reinforcement is to be provided.

119. In limit state of collapse for direct compression, the maximum axial compressive strain in concrete is

(A) 0·002 (B) 0·003

(C) 0·0035 (D) 0·004

120. A reduction factor C_r to load carrying capacity for a long column of effective length L_e and width b is applied as obtained from following expression :

(A) $1 - \frac{L_e}{24\,b}$ (B) $1{\cdot}25 - \frac{L_e}{86\,b}$

(C) $1{\cdot}25 - \frac{L_e}{48\,b}$ (D) $1{\cdot}5 - \\frac{L_e}{60\,b}$

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121. The standard 5-day BOD at 20°C, when compared to ultimate BOD is about

(A) 60% (B) 68%

(C) 80% (D) 90%

122. The global warming is caused mainly by

(A) NO_X (B) SO_X

(C) CO_2 (D) O_2

123. The ratio of the quantity of water stored in the root zone of the crops to the quantity of water actually delivered in the field is known as

(A) water use efficiency

(B) water conveyance efficiency

(C) water application efficiency

(D) water storage efficiency

124. For unlined canals, the freeboard is measured from the

(A) full supply level to top of the bank

(B) top of the bank to bed of the canal

(C) full supply level to top of the dowel

(D) None of the above

125. The ruling minimum radius of the curve for ruling design speed V m/sec, coefficient of friction f, acceleration due to gravity g m/sec^2 and superelevation e is given by

(A) $V^2/(e-f)g$ (B) $V^2/(f-e)g$

(C) $V^2/(e+f)g$ (D) $V^2/(e+f)2g$

126. Camber in the road is provided for

(A) counteracting the centrifugal force

(B) effective drainage

(C) having proper sight distance

(D) avoiding overturning

127. "Poisson's ratio" is defined as the ratio of

(A) lateral strain to linear strain

(B) linear strain to lateral strain

(C) lateral stress to linear stress

(D) linear stress to lateral stress

128. If 'A' is the area of cross-section and T is the moment of inertia of a given plane section, then radius of gyration (r) is given by the formula

(A) $r = I/A$ (B) $r = \sqrt{I/A}$

(C) $r = A/I$ (D) $r = \sqrt{A/I}$

129. Strain energy due to axial deformation is given by

(σ : resultant stress

P : axial load

Δ : deformation

ε : strain

E : modulus of elasticity)

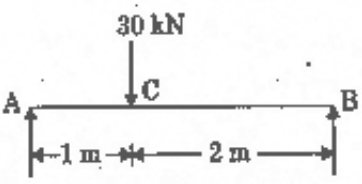
(A) $\sigma\varepsilon$ (B) $P\Delta$

(C) $\sigma^2/2E$ (D) $\frac{1}{2}P\Delta$

130. The maximum shear force in a simply supported beam of span L, subjected to a central point load, W is given by the following expression :

(A) $\frac{W}{2}$ (B) WL

(C) $WL^2/2$ (D) $WL^2/4$

131. 

For simply supported beam shown in Fig., the magnitude of vertical reaction at 'B' is

(A) 20 kN (B) 18 kN

(C) 15 kN (D) 10 kN

132. A tie is a

(A) tension member

(B) compression member

(C) flexural member

(D) torsion member

133. The slenderness ratio of lacing bars should *not* exceed

(A) 120 (B) 145

(C) 180 (D) 100

134. The minimum clear cover (in mm) for the main reinforcement in column, according to IS : 456-2000 is

(A) 20 (B) 25

(C) 40 (D) 50

135. The diameter of longitudinal bars of a RCC column should never be less than

(A) 6 mm (B) 8 mm

(C) 10 mm (D) 12 mm

136. In an RCC section of effective depth 'd', if vertical stirrups are provided to resist shear, their maximum spacing measured along the axis of the member as per IS : 456-2000 should *not* exceed

(A) 0·25 d (B) 0·50 d

(C) 0·75 d (D) 1·00 d

137. For a continuous slab of 3 m × 3·5 m size, the minimum overall depth of slab to satisfy vertical deflection limit is

(A) 5 cm (B) 7·5 cm

(C) 10 cm (D) 15 cm

138. As per IS : 800, the factor of safety adopted with respect to the yield stress of steels is

(A) 1·45 (B) 1·5

(C) 1·67 (D) 2·0

139. The size of a rivet is identified by

(A) diameter of shank

(B) diameter of head

(C) length of shank

(D) shape of head

140. Horizontal stiffeners are needed in plate girders if the thickness of web is less than

(A) 6 mm (B) Depth/200

(C) Span/500 (D) Flange thickness

141. Permissible stress may also be known as

(A) ultimate stress

(B) working stress

(C) limit stress

(D) yield stress

142. The maximum permissible stress for power driven field rivet in bearing on rivet is

(A) 100 N/mm^2 (B) 250 N/mm^2

(C) 270 N/mm^2 (D) 300 N/mm^2

143. Bearing stiffeners are designed as

(A) beams (B) beam-ties

(C) ties (D) column

144. The maximum allowable slenderness ratio for members carrying compressive load due to wind and seismic force only is

(A) 180 (B) 250

(C) 350 (D) 400

145. The throat in a fillet weld is

(A) large side of the triangle of the fillet

(B) hypotenuse of the triangle of the fillet

(C) smaller side of the triangle of the fillet

(D) perpendicular distance from the root to the hypotenuse

146. The correction to be applied to each 30 m chain for a line measurement along a slope of θ is -

(A) $30(1 - \cos\theta)$ (B) $30(1 - \sin\theta)$

(C) $30(1 - \tan\theta)$ (D) $30(1 - \cot\theta)$

147. Narrowly spaced contour lines on a map shows that the area is

(A) Flat

(B) Steeply sloped

(C) Vertical cliff

(D) Overhang cliff

148. The length of the tangent of a curve whose radius is R and the angle of deflection Δ is

(A) $R \tan \frac{\Delta}{2}$ (B) $2R \sin \frac{\Delta}{2}$

(C) $2R \tan \frac{\Delta}{2}$ (D) $R \sin \frac{\Delta}{2}$

149. Radiation, Intersection and Resection are

(A) Compass Surveying Techniques

(B) Chain Surveying Techniques

(C) Levelling Techniques

(D) Plane Table Surveying Techniques

150. Which of the following statements in respect of a map A having scale 1 : 1000 and another map B having scale 1 : 5000 is true ?

(A) Map A is a large scale map compared to map B.

(B) Map B is a large scale map compared to map A.

(C) Map B is a more detailed map compared to map A.

(D) None of the above

151. A staff reading taken on a point whose elevation is to be determined as a change point is called

(A) foresight reading

(B) backsight reading

(C) intermediate sight

(D) long sight

152. Clay is generally

(A) cohesive

(B) permeable

(C) having large particle size

(D) None of the above

153. The ratio $\frac{\text{Liquid limit} - \text{Water content}}{\text{Plasticity index}}$ for a soil mass is called

(A) Liquidity index

(B) Shrinkage ratio

(C) Consistency index

(D) Toughness index

154. If whole circle bearing of a line is 210° 0′ 0″, its value in quadrantal bearing system is

(A) S 30° 0′ 0″ W (B) N 30° 0′ 0″ E

(C) S 30° 0′ 0″ E (D) N 30° 0′ 0″ W

155. The magnetic declination is the difference between

(A) True Meridian and False Meridian

(B) False Meridian and True Meridian

(C) True Meridian and Magnetic Meridian

(D) Magnetic Meridian and False Meridian

156. To prevent segregation, the maximum height for placing concrete, is

(A) 100 cm (B) 125 cm

(C) 150 cm (D) 200 cm

157. Di-calcium silicate (C_2S)

(A) hydrates rapidly

(B) generates less heat of hydration

(C) hardens rapidly

(D) has less resistance to sulphate attack

158. Separation of coarse aggregates from concrete during transportation, is known as

(A) bleeding (B) creeping

(C) segregation (D) evaporation

159. The resistance of an aggregate to wear is known as

(A) impact value

(B) abrasion resistance

(C) shear resistance

(D) crushing resistance

160. If fineness modulus of a sand is 2·5, it is graded as.

(A) very fine sand

(B) fine sand

(C) medium sand

(D) coarse sand

161. Water-cement ratio is measured _____ of water and cement used per cubic metre of concrete.

(A) volume by volume

(B) weight by weight

(C) weight by volume

(D) volume by weight

162. For batching 1 : 2 : 4 concrete mix by volume the ingredients required per bag (50 kg) of cement are

(A) 100 litres of fine aggregate : 140 litres of coarse aggregate

(B) 100 kg of fine aggregate : 200 kg of coarse aggregate

(C) 70 kg of fine aggregate : 140 kg of coarse aggregate

(D) 70 litres of fine aggregate : 140 litres of coarse aggregate

163. Bulking is

(A) increase in volume of sand due to moisture which keeps sand particles apart

(B) increase in density of sand due to impurities like clay, organic matter

(C) ramming of sand so that it occupies minimum volume

(D) compacting of sand

164. The concrete cubes are prepared, cured and tested according to Indian Standards code number

(A) IS : 515 (B) IS : 516

(C) IS : 517 (D) IS : 518

165. An aggregate is said to be flaky, if its least dimension is less than

(A) $\frac{2}{3}$ mean dimension

(B) $\frac{1}{2}$ mean dimension

(C) $\frac{3}{5}$ mean dimension

(D) $\frac{3}{4}$ mean diameter

166. The fineness of cement can be found out by sieve analysis using IS sieve number

(A) 20 (B) 10

(C) 9 (D) 6

167. The discharge through a V-notch varies
(A) proportional to head (H)
(B) inversely proportional to angle θ
(C) proportional to $H^{5/2}$
(D) inversely proportional to tan θ/2

168. The volume of voids to the total volume of soil is known as
(A) porosity
(B) void ratio
(C) air ratio
(D) air content

169. A fundamental equation of void ratio (e), specific gravity (G), water content (W) and the degree of saturation (S_p) is
(A) $e = \frac{WG}{S_p}$ (B) $W = \frac{eG}{S_p}$
(C) $G = \frac{eW}{S_p}$ (D) $S_p = \frac{eW}{G}$

170. Manometer is a device used for measuring
(A) Velocity (B) Pressure
(C) Density (D) Discharge

171. Capillarity is due to
I. surface tension
II. cohesion
III. viscosity
IV. vapour pressure
V. weight density of liquid
(A) II, III (B) III
(C) I (D) II, III, V

172. Flow of water through a passage under atmospheric pressure is called
(A) Pipe flow
(B) Uniform flow
(C) Open channel flow
(D) Non-uniform flow

173. Each term of the Bernoulli equation represents
(A) energy per unit weight
(B) energy per unit mass
(C) energy per unit volume
(D) specific energy

174. Pressure in terms of metres of oil (specific gravity = 0·9) equivalent to 4·5 m of water is
(A) 4·05 (B) 5·0
(C) 3·6 (D) 0·298

175. Typically, a hydroelectric plant will have following hydraulic machine :
(A) Hydraulic Turbine
(B) Hydraulic Pump
(C) Electric Motor
(D) None of the above

176. Darcy – Weisbach equation to calculate the head loss due to friction for flow through pipes is applicable when the flow through the pipe can be
(A) laminar only
(B) turbulent only
(C) both laminar and turbulent
(D) suberitical flow

177. The dimension for Angular velocity is
(A) T^2 (B) T^{-1}
(C) T^1 (D) T^{-2}

178. Which of the following flow constants does *not* have any unit ?
(A) Chezy's C
(B) Manning's N
(C) Both Chezy's C and Manning's N
(D) None of the above

179. The damp proof course (D.P.C.) of uniform thickness in a building having walls of different widths is measured in

(A) m^4 (B) m^3

(C) m^2 (D) m

180. The plan of a building is in the form of a rectangle with centre line dimensions of the outer walls as 10·3 m × 15·3 m. The thickness of the walls in superstructure is 0·3 m. Then its carpet area is

(A) 150 m^2 (B) 157·59 m^2

(C) 165·36 m^2 (D) 170 m^2

181. Pick up the item of work *not* included in the plinth area estimate.

(A) Wall thickness

(B) Room area

(C) Verandah area

(D) Courtyard area

182. One brick thickness of wall is roughly equal to

(A) 10 cm (B) 15 cm

(C) 20 cm (D) 30 cm

183. A work costing ₹ 20,000 is termed as

(A) Petty work (B) Minor work

(C) Major work (D) Minor project

184. The density of cement is taken to be

(A) 1000 kg/m^3 (B) 1250 kg/m^3

(C) 1440 kg/m^3 (D) 1800 kg/m^3

185. The value of the property at the end of its useful life (without being dismantled) is known as

(A) Salvage value

(B) Scrap value

(C) Book value

(D) Junk value

186. The multiplying constant for the tacheometer is, generally, kept as

(A) 100 (B) 20

(C) 40 (D) 60

187. The fundamental principle of surveying is to work from the

(A) whole to part

(B) part to whole

(C) lower level to higher level

(D) higher level to lower level

188. Volume by Trapezoidal Formula Method is determined by the formula

(A) $D\left\{\frac{A_0 + A_n}{2} + A_2 + A_4 + A_6 + \ldots A_{n-1}\right\}$

(B) $D\left\{\frac{A_1 + A_n}{2} + A_0 + A_1 + A_3 + \ldots A_{n-1}\right\}$

(C) $D\left\{\frac{A_0 + A_1}{2} + A_1 + A_3 + A_5 + \ldots A_{n-1}\right\}$

(D) $D\left\{\frac{A_0 + A_n}{2} + A_1 + A_2 + A_3 + A_4 + \ldots A_{n-1}\right\}$

189. The annual instalment (I) of the sinking fund (S) over n years, at i rate of interest may be calculated from the formula

(A) $I = Si / (1 + i)^{n-1}$

(B) $I = S(1 + i)^{n-1} / i$

(C) $I = S(1 + i)^{n+1} / (1 + i)$

(D) $I = Si / (1 + i)^{n+1}$

190. Mild steel used in RCC structures conforms to

(A) IS : 432 (B) IS : 1566

(C) IS : 1786 (D) IS : 2062

191. Which of the following types of lime is used for plastering and white washing ?

(A) Quick lime

(B) Slaked lime

(C) Hydraulic lime

(D) Fat lime

192. Which of the following acts as retarder for the concrete ?

(A) Calcium chloride

(B) Calcium lignosulphonate

(C) Calcium stearate

(D) Aluminium powder

193. Identify the *wrong* statement.

(A) Bulking of sand can go up to 40%.

(B) Bulking of sand is maximum at 4·6% moisture content.

(C) Bulking of sand is considered in weigh batching of concrete mix.

(D) Bulking of sand occurs due to free moisture film formation over sand grain.

194. Strength based classification of bricks is made on the basis of

(A) IS : 3101 (B) IS : 3102

(C) IS : 3495 (D) IS : 3496

195. In paints, methylated spirit, naphtha and turpentine are used as

(A) Base (B) Binder

(C) Solvent (D) Extender

196. Coarse sand has a fineness modulus in the range of

(A) 2·2 – 2·4 (B) 2·4 – 2·6

(C) 2·6 – 2·9 (D) 2·9 – 3·2

197. Under heat and pressure, granite can transform into

(A) quartzite (B) marble

(C) slate (D) gneiss

198. Aluminium is anodized to protect it from weathering effect by forming a surface coat of

(A) Aluminium carbide

(B) Aluminium borate

(C) Aluminium oxide

(D) Red lead

199. Quartzite and marble are by nature

(A) volcanic (B) plutonic

(C) sedimentary (D) metamorphic

200. Most accurate method of estimation is based on

(A) Building cost index estimate

(B) Plinth area estimate

(C) Detailed estimate

(D) Cube rate estimate

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101.C	102.A	103.A	104.C	105.A	106.A	107.D	108.A	109.D	110.C
111.C	112.C	113.A	114.B	115.B	116.C	117.A	118.C	119.A	120.C
121.B	122.C	123.C	124.A	125.C	126.B	127.A	128.B	129.D	130.A

131.D 132.A 133.B 134.C 135.D 136.C 137.B 138.C 139.A 140.B
141.B 142.C 143.D 144.B 145.D 146.A 147.B 148.A 149.D 150.A
151.A 152.A 153.C 154.A 155.C 156.A 157.B 158.C 159.B 160.B
161.B 162.B 163.A 164.B 165.C 166.C 167.C 168.A 169.A 170.B
171.C 172.C 173.A 174.B 175.A 176.C 177.B 178.B 179.C 180.A
181.D 182.C 183.A 184.C 185.A 186.A 187.A 188.D 189.A 190.A
191.D 192.B 193.C 194.B 195.C 196.D 197.D 198.C 199.D 200.C