PROVISIONAL ANSWER KEY
Assistant Engineer (Civil), Class II, Advt No. 101/2016-17(AWA)
Preliminary Test on 26-03-2017
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Note: Candidate must ensure the compliance to send all suggestion in the given format with reference to this paper with provisional answer key only.

101. The line passing through points of zero declination is known as

(A) isogonic line
(B) agonic line
(C) magnetic line
(D) Azimuth

102. When differential leveling is done in order to connect a bench mark to the starting point of the alignment of any road, railway, canal project, it is called

(A) Profile leveling
(B) Cross-section leveling
(C) Reciprocal leveling
(D) Fly leveling

103. Contour lines meeting at a point indicate

(A) Vertical cliff
(B) Uniform space
(C) Hillock
(D) Steep slope

104. In the equation of a planimeter, 'N' is _____, when zero of the dial passes the index mark in a clockwise direction

(A) + ve
(B) - ve
(C) 0
(D) None of the above

105. R.L. of point 'A' is 50 m and R.L. of point 'B' is 46.655 m. The distance between AB is 150 m. The gradient of line AB is

(A) 1 in 6726 (Rising)
(B) 1 in 6726 (Falling)
(C) 1 in 3000 (Rising)
(D) 1 in 3000 (Falling)

106. The timber piece whose breadth and thickness exceed 50 mm, but are less than 200 mm in length is called

(A) Pole
(B) Baulk
(C) Scantling
(D) Batten

107. The glass articles, after manufactured, are to be cooled down slowly and gradually. The process of slow and homogeneous cooling of glass articles is known as

(A) Annealing
(B) Blowing
(C) Rolling
(D) Spinning

108. When the final coat of paint has not sufficient opacity, the background is clearly seen. This is known as

(A) Grinning
(B) Bloom
(C) Wrinkling
(D) Flaking

109. Following is not the process involved in the fabrication of articles of plastic

(A) Laminating
(B) Blowing
(C) Calendering
(D) Tempering

110. _____ porcelain contains 70% to 90% silicate of magnesia

(A) Cordierite
(B) Zircon
(C) Carbon and graphite
(D) Steatic

111. The _____ in excess makes the cement unsound and causes the cement to expand and disintegrate

(A) Silica (B) Alumina

(C) Magnesia (D) Lime

112. _____ are used to finish concrete surfaces such as bridge floors, road slabs, station platforms etc.

(A) Immersion vibrators (B) Surface vibrators

(C) Form vibrators (D) Internal vibrators

113. In case of big projects, a certain amount to the extent of about 1.5% to 2% of the estimated cost is provided in the estimate as

(A) Work charged establishment (B) Revised estimates

(C) Supplementary estimate (D) Annual estimate

114. In rate analysis, the unit of measurement Indian W.C. size 580 mm size is

(A) Kg (B) Number

(C) Pair (D) Sq.meter

115. Certain amounts such as water supply fittings, sanitary fittings, door and window fittings, etc. are to be decided by the architect in consultation with his client at some future date. The details of such items are not worked out at the time of inviting tenders, but for execution of such items, a lump sum amount is put up in the bill of quantities. This amount is known as

(A) Prime cost (B) Provisional sum

(C) Spot amount (D) Deviated cost

116. Surface tension is expressed in

(A) N/m (B) N/m^2

(C) N^2/m (D) N/m^3

117. The scale effects in models can be

(A) Positive only (B) Negative only

(C) Both positive and negative (D) None of the above

118. _____ is the square root of the ratio of the inertia force to the pressure force

(A) Reynolds number (B) Mach's number

(C) Euler's number (D) Froude's number

119. The momentum correction factor 'β' is used in account for

(A) Change in direction of flow

(B) Change in total energy

(C) Non-uniform distribution of velocities at inlet and outlet section

(D) Change in mass rate of flow

120. A flow net is a graphical representation of stream lines and equipotential lines such that these lines

(A) Intersect each other orthogonally curvilinear squares

(B) Intersect each other at various different angles forming irregular-shaped nets

(C) Indicate the direction and magnitude of vector

(D) None of above

121. In open channel, the specific energy is

(A) The total energy per unit discharge

(B) The total energy measured above a horizontal datum

(C) The total energy measured with respect to the channel bottom which is taken as datum

(D) The kinetic energy plotted above the free surface

122. The boundary layer exists in which of the following?

(A) Flow of real fluids (B) Flow of ideal fluids

(C) Flow over flat surfaces only (D) Pipe flow only

123. The drag and lift forces experienced by an object placed in a fluid stream are due to

(A) Pressure and turbulence (B) Viscosity and turbulence

(C) Pressure and viscosity (D) Pressure and gravity

124. In case of turbulent flow, the loss of head is approximately proportional to

(A) Velocity
(B) $(\text{velocity})^{1/2}$
(C) $(\text{velocity})^{3/4}$
(D) $(\text{velocity})^{2}$

125. _____ are those which are capable of working under heads less than 30 m.

(A) Low head turbine
(B) Medium head turbine
(C) High head turbine
(D) None of above

126. The method used for estimating missing rainfall is

(A) Normal ratio method
(B) Station year method
(C) Plotting position method
(D) Rational method

127. The discharge per unit drawdown at a well is known as

(A) Specific yield
(B) Specific discharge
(C) Specific capacity
(D) Specific transmissibility

128. _____ is defined as the amount of irrigation water that is required to meet the evapo-transpiration needs of the crop during its full growth.

(A) Gross Irrigation Requirement
(B) Net Irrigation Requirement
(C) Consumptive Irrigation Requirement
(D) Field Irrigation Requirement

129. In Gravity dam, the _____ acts in a direction opposite to the acceleration imparted by earthquake forces and is equal to the product of the mass and the acceleration

(A) Inertia force
(B) Hydrodynamic force
(C) Uplift force
(D) Wave pressure

130. A _____ is an irrigation structure constructed across a canal to lower down its water level and destroy the surplus energy liberated from the falling water which may otherwise scour the bed and banks of the canal

(A) Canal falls
(B) Head regulator
(C) Canal escape
(D) Canal outlets

131. In Gravity dam, the factor of safety against overturning should not be less than

(A) 1.15 (B) 1.5

(C) 1.8 (D) 2

132. In reservoir, the volume of water below the minimum pool level is known as

(A) Dead storage (B) Surcharge storage

(C) Valley storage (D) Useful storage

133. Evaporation is determined experimentally using

(A) An open pan (B) A neutron probe

(C) A lysimeter (D) An infiltrometer

134. Total angle of deflection of a transition curve is

(A) Spiral angle (B) Spiral angle / 2

(C) Spiral angle / 3 (D) Spiral angle / 4

135. Perpendicular offset from the junction of a transition curve and circular curve to the tangent is equal to

(A) Shift (B) 0.5 × Shift

(C) 2 × Shift (D) 4 × Shift

136. In photographic surveying, the bisectors of an angle between the lines joining the plumb points and principal points intersect the ground and picture planes at 'I' and 'i' respectively called

(A) Angle of tilts (B) Principal points

(C) Isocentres (D) Plumb points

137. IRC has introduced new Special Vehicle (SV) class loading for select corridor where passage of trailor vehicle carrying stator units, turbine, heavy equipment & machinery etc. may occur. What is the amount of vehicle load for IRC class SV loading?

(A) 100 T (B) 385 T

(C) 400 T (D) 215 T

138. Which of the following is Ryve's formula, to be used for flood estimation

(A) $Q = C \times M^{2/3}$ (B) $Q = C \times M^{3/4}$

(C) $Q = C \times M^{n}$ (D) $Q = C \times M^{1/2}$

139. The formula _____ is applicable only for 6 – 15 m span T – bridge bridges, where, W = Total weight in kg/m^2, L = clear span in meter

(A) $W = 415 + 80L$ (B) $W = 198.5\ L$

(C) $W = 166\ L$ (D) $W = 144\ L$

140. When a spur of short length is taken perpendicular to the bank, it only deflects the flow locally. Hence, it is called

(A) Repelling spur (B) Attracting spur

(C) Deflecting spur (D) Special spur

141. Critical path

(A) is always longest (B) is always shortest

(C) may be longest (D) may be shortest

142. Grader is used mainly for

(A) trimming and finishing (B) shaping and trimming

(C) finishing and shaping (D) finishing, shaping and trimming

143. The process of incorporating changes and rescheduling or replanning is called

(A) resource leveling (B) resource smoothening

(C) updating (D) critical path scheduling

144. Which of the following excavator is most suitable for digging under water?

(A) Drag line (B) Hoe

(C) Calm shell (D) Dipper shovel

145. The square root of the ratio of moment of inertia of the cross section to its cross-sectional area is called

(A) Second moment of area (B) Slenderness ratio

(C) Section modulus (D) Radius of gyration

146. Special investigation should be carried out for bridges having following features: As per IRC recommendations minimum length of approaches at ends of the bridge is

(A) 30 m (B) 20 m

(C) 15 m (D) 35 m

147. The point of contraflexure occurs in

(A) Cantilever beams (B) Simply supported beams

(C) Overhanging beams (D) Fixed beams

148. Bridge whose flooring is supported or suspended at the bottom of the superstructure is called

(A) Deck bridge (B) Through bridge

(C) Semi-through bridge (D) None of the above

149. Section modulus of Hollow Circular Section having external Dia. (D) and internal Dia. (d) is

(A) $\pi (D-d)^4/32$ (B) $\pi (D^4-d^4)/36D$

(C) $\pi (D^4-d^4)/32D$ (D) $\pi (D-d)^4/36$

150. The maximum bending moment due to a train of wheel loads on a simply supported girder

(A) always occurs at centre of span (B) always occurs under a wheel load

(C) never occurs under a wheel load (D) None of the above

151. Which of the following is not the displacement method?

(A) Equilibrium method (B) Column analogy method

(C) Moment distribution method (D) Kani's method

152. If the loading on a simply supported pre-stressed concrete beam is uniformly distributed, the centroid of tendons should be preferably

(A) a straight profile along the centroidal axis

(B) a straight profile along with the lower kern

(C) a parabolic profile with convexity downward

(D) a circular profile with convexity upward

153. The loss of stress with the time at constant strain is called

(A) relaxation (B) creep

(C) shrinkage (D) ductility

154. As per IS 456:2000, Minimum grade of concrete for plain concrete exposed to sea coast is

(A) M20 (B) M30

(C) M40 (D) M25

155. As per IS 456:2000, minimum period before striking form work for vertical surface of the columns

(A) 1 days (B) 7days

(C) 14 days (D) 28 days

156. Flexural strength (fcr in N/mm^2)of concrete is computed by

(A) $5000\sqrt{fck}$ (B) $7000\sqrt{fck}$

(C) $0.7\sqrt{fck}$ (D) $0.5\sqrt{fck}$

157. Maximum area of compression reinforcement for beams is

(A) 0.04bD (B) 0.85bd/fy

(C) 0.1 percent of web area (D) 0.5 percent of web area

158. In case of columns area of longitudinal reinforcement shall be not less than

(A) 0.60% (B) 0.70%

(C) 0.80% (D) 1.00%

159. Minimum pitch of the rivets shall not be less than

(A) 1.5d (B) 2.0d

(C) 2.5d (D) 3.0d

160. A butt weld is specified by

(A) effective throat thickness (B) plate thickness

(C) size of weld (D) penetration thickness

161. The slenderness ratio of lacing bars should not exceed

(A) 100 (B) 120

(C) 145 (D) 180

162. Economical depth of plate girder corresponds to

(A) minimum weight (B) minimum depth

(C) maximum weight (D) minimum thickness of web

163. Gantry girders are designed to resist

(A) lateral loads

(B) longitudinal loads and vertical loads

(C) lateral, longitudinal and vertical loads

(D) lateral and longitudinal loads

164. The ratio of volume of voids to the total volume of soil mass is called

(A) Air content (B) Porosity

(C) Percentage air voids (D) Voids ratio

165. If the plasticity index of a soil mass is zero, the soil is

(A) sand (B) silt

(C) clay (D) clayey Silt

166. Rankine's theory of earth pressure assumes that back of the wall is

(A) plane and smooth (B) plane and rough

(C) vertical and smooth (D) vertical and rough

167. In a steel plate with bolted connections, the rupture of the net section is a mode of failure under

(A) Tension (B) Compression

(C) Flexure (D) Shear

168. Westergaard's analysis for stress distribution beneath loaded areas is applicable to

(A) Sandy soils (B) Clayey soils

(C) Stratified soils (D) Silty soils

169. The fundamental natural period for vibration of steel frame building is

(A) $0.075h^{0.75}$ (B) $0.085h^{0.75}$

(C) $0.075h^{0.85}$ (D) $0.085h^{0.85}$

170. As per IS 1893:2002, dynamic analysis shall ber performed for regular buildings of height greater than _____ m in zones IV

(A) 50 (B) 40

(C) 45 (D) 60

171. Percentage of imposed load to be considered _____ in seismic weight consideration for Imposed uniformly distributed floor load above 3 kN/m^2

(A) 25 (B) 30

(C) 50 (D) 75

172. The safe bearing capacity of the soil is equal to

(A) Normal strength × Factor of safety

(B) Ultimate bearing power/Factor of safety

(C) Ultimate tensile strength/ Factor of safety

(D) Ultimate compressive strength/Factor of safety

173. Minimum thickness of a layer of fine sand required to cutoff capillary rise of water completely should be

(A) 40 cm (B) 52 Cm

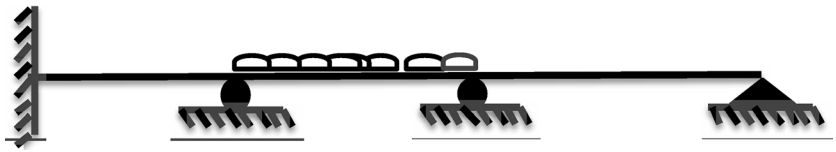
(C) 64 cm (D) 76 cm

174. The consistency and flow resistance of bitumen can be determined from which of the following?

(A) Ductility test (B) Penetration test

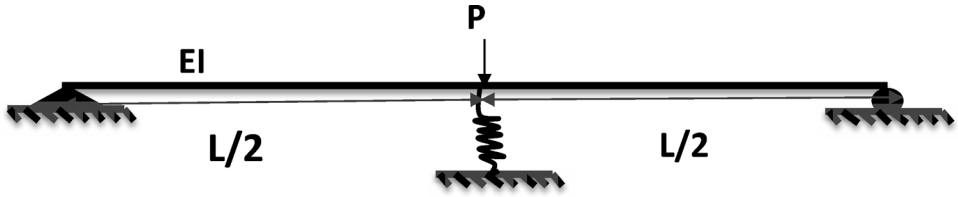
(C) Softening point (D) Viscosity test

175. How many number of point of contraflexture will form in continuous beam shown in figure below?



(A) 2 (B) 3
(C) 4 (D) 5

176. A simply supported beam of span length L and flexure stiffness EI has another spring support at the centre span of stiffness K as shown in figure. The central deflection of the beam due to a central concentrated load of P would be



(A) $[PL^3/48EI]+[P/K]$ (B) $PL^3/[48EI+KL^3]$
(C) $[PL^3/48EI][P/K]$ (D) $[PL^3/48EI]+K$

177. For a linear elastic frame, if stiffness matrix is doubled with respect to the existing stiffness matrix, the deflection of the resulting frame will be

(A) twice the existing value (B) half the existing value
(C) the same as existing value (D) indeterminate value

178. Two shaft of different diameter d_1 and d_2 are made from same material and are of same length under the action of same torque T the ratio of strain energy V_1/V_2

(A) $[d_2/d_1]^3$ (B) $[d_1/d_2]^2$
(C) $[d_2/d_1]^2$ (D) $[d_2/d_1]^4$

179. Two people weighing W each are sitting on a plank of length L floating on water at L/4 from either end. Neglecting the weight of the plank, the bending moment at the centre of the Plank is

(A) WL/8 (B) WL/16
(C) WL/32 (D) zero

180. The Indian navigation system similar of GPS of USA is called as

(A) BHAVUN (B) NAVIC

(C) GLONASS (D) Galileo

181. Ultimate strength to cement is provided by

(A) Tri-calcium silicate (B) Di-calcium silicate

(C) Tri-calcium aluminate (D) Tetra calcium alumino ferrite

182. A RCC slab under mild exposure condition having main longitudinal tensile reinforcement of diameter 12 mm, then minimum allowable nominal cover to satisfy durability requirement is

(A) 10mm (B) 15mm

(C) 20mm (D) 25mm

183. For an I-beam shape factor is 1.12, The factor of safety in bending is 1.5. If the allowable stress is increased by 20% for wind and earthquake loads, then the load factor is

(A) 1.1 (B) 1.25

(C) 1.35 (D) 1.4

184. If creep coefficient for concrete at 7 days is K_1 and 28 days is K_2 then

(A) $K_1 > K_2$ (B) $K_1 < K_2$

(C) $K_1 = K_2$ (D) $K_1 \leq K_2$

185. Efflorescence is due to the presence of

(A) excessive soluble salts in the mortar

(B) rust in the reinforcing steel

(C) cracks in the masonry

(D) stagnating water

186. The relation between intensity of wind pressure P and Velocity V is taken as

(A) $P \alpha V$ (B) $P \alpha V^{1/2}$

(C) $P \alpha 1/V$ (D) $P \alpha V^2$

187. A mild steel bar is in two parts having equal length. The area of cross-section of part-1 is double that of part-2. If the bar carries an axial load P, then the ratio of elongation in part-1 to that in part-2 will be

(A) 2 (B) 4

(C) 1/2 (D) 1/4

188. In the compaction test, MDD stands for maximum dry density and OMC for optimum moisture content. As compaction energy increases

(A) Both MDD and OMC increases

(B) MDD decreases and OMC increases

(C) MDD increases and OMC decreases

(D) No change in MDD and OMC

189. To get the precise location of a point using GPS , the signals are required from minimum how many satellite

(A) 3 (B) 4

(C) 5 (D) 2

190. 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

191. A longest extradosed bridge in India is

(A) Naramada Bridge (B) Barapulla Bridge

(C) Indraprastha Bridge (D) Vivekanand Bridge

192. When the water content in a soil at which just shear strength develops is called

(A) liquid Limit (B) plastic Limit

(C) elastic Limit (D) shrinkage Limit

193. Volume of 1 bag of cement is

(A) 0.025 cubic meter (B) 0.035 cubic meter

(C) 0.045 cubic meter (D) 0.055 cubic meter

194. The horizontal angle between true meridian and magnetic meridian is known as

(A) bearing
(B) dip
(C) magnetic declination
(D) None of the above

195. Two circular curves with opposite deflection angles is known as

(A) reverse curve
(B) compound curve
(C) transition curve
(D) vertical curve

196. The line normal to the plumb line is known as

(A) horizontal line
(B) vertical line
(C) datum line
(D) level line

197. The most desirable alignment of an irrigation canal is along

(A) the ridge line
(B) the contour line
(C) the valley line
(D) None of the above

198. Which test measures the stability of Self-Compacting concrete (SCC)

(A) J-Ring
(B) L-Box
(C) V-funnel
(D) Column / Probe segregation

199. In the soil sample of a consolidometer test, pore water pressure is

(A) minimum at the centre
(B) maximum at the top
(C) maximum at the bottom
(D) maximum at the centre

200. In a Mohr's diagram, a point above Mohr's envelope indicates

(A) imaginary condition
(B) safe condition
(C) imminent failure condition
(D) condition of maximum obliquity

201. The depth of the centre of pressure on a vertical rectangular gate (4 m wide and 3 m high) with water up to top surface is

(A) 1.0 m
(B) 1.5 m
(C) 2.0 m
(D) 2.5 m

202. The first reading of level station is

(A) foresight
(B) intermediate sight
(C) back-sight
(D) any sight

203. If the whole circle bearing of line is 270° its reduce bearing

(A) N 90° W
(B) S 90° W
(C) W 90°
(D) 90° W

204. Magnetic bearing of a line AB was N 59° 30' W in the year 1967, when the declination was 4° 10' E. If the present declination is 3° W. the whole circle bearing of the line is

(A) 299° 20'
(B) 307° 40'
(C) 293° 20'
(D) 301° 40'

205. Which of the following is not a mode of securing the risk, generally adopted by the bank before giving loans to a construction firm

(A) Hypothecation
(B) Pledge
(C) Lease
(D) Mortgage

206. The type of surveying in which the curvature of the earth is taken into account is called

(A) Geodetic surveying
(B) Plane surveying
(C) Preliminary surveying
(D) Topographical surveying

207. Dynamic viscosity has the dimensions as

(A) MLT^{-1}
(B) $ML^{-1}T^{-1}$
(C) $ML^{-1}T^{-2}$
(D) $M^{-1}L^{-1}T^{-1}$

208. The gases are considered incompressible when Mach number is

(A) equal to 1.0
(B) equal to 0.5
(C) equal to 0.3
(D) equal to 0.2

209. The act which defines the amount of compensation to be given to a construction workers in case of permanent total disablement is called

(A) Minimum wage act

(B) Workmen's compensation act

(C) Contract labour(regulation and Abolition) act

(D) The industrial dispute act

210. The condition of stable equilibrium for a floating body is

(A) The metacentre M coincides with the centre of gravity G

(B) The metacentre M is below centre of gravity G

(C) The metacentre M is above centre of gravity G

(D) The centre of buoyancy B is above centre of gravity G

211. Hydraulic gradient line (H.G.L.) represents the sum of

(A) Pressure head and kinetic head

(B) kinetic head and datum head

(C) Pressure head, kinetic head and datum head

(D) Pressure head and datum head

212. Kinematic similarity between model and prototype means

(A) The similarity of forces

(B) The similarity of shape

(C) The similarity of motion

(D) The similarity of discharge

213. If the velocity, pressure, density, etc., change at a point with respect to time, the flow is called

(A) uniform

(B) compressible

(C) unsteady

(D) incompressible

214. Venturi-meter is used to measure

(A) discharge

(B) average velocity

(C) velocity at a point

(D) pressure at a point

215. The earthen embankments constructed parallel to the river at some suitable distance for protection from flooding, are called

(A) Groynes

(B) Guide banks

(C) Levees

(D) Terraces

216. The salinity in water

(A) does not affect evaporation
(B) reduces the evaporation
(C) increases the evaporation
(D) none of the above

217. Atmometer is used to measure

(A) evaporation
(B) transpiration
(C) evapotranspiration
(D) all of the above

218. Loss of strength of cement stored in bags in godowns for 3 months is about

(A) 30%
(B) 50%
(C) 15%
(D) 0%

219. Which of the following formations has poor permeability, but seepage is possible?

(A) Aquifer
(B) Aquiclude
(C) Aquifuge
(D) Aquitard

220. Beaver dam is type of

(A) Earth dam
(B) Buttress dam
(C) Timber dam
(D) Steel dam

221. A forebay is an enlarged body of water provided just in

(A) Power house
(B) Draft tube
(C) Penstocks
(D) Turbines

222. Aluminum is obtained from the ore called as

(A) Bauxite
(B) Ferrite
(C) Magnetite
(D) Calcite

223. Deflection in a truss depends upon

(A) axial rigidity
(B) flexural rigidity
(C) torsional rigidity
(D) axial and flexural rigidity

224. An orifice is called a large orifice if water head, is

(A) twice the diameter of the orifice

(B) thrice the diameter of the orifice

(C) four times the diameter of the orifice

(D) five times the diameter of the orifice

225. A stagnation point is a point

(A) Where the pressure is zero

(B) Where the total energy is zero

(C) Where the velocity of flow reduces to zero

(D) Where the total energy is maximum

226. According to the direction of flow through runner, Pelton turbine is

(A) Tangential flow impulse turbine (B) Radial flow impulse turbine

(C) Axial flow impulse turbine (D) Mixed flow impulse turbine

227. Type of Jump occurs for froude number F_1 = 4.5 to 9.0

(A) Steady (B) Strong

(C) Undular (D) Oscillating

228. For cereal crops the most commonly adopted method of irrigation, is

(A) free flooding (B) check method

(C) furrow method (D) sprinkler method

229. For standing crops in undulating sandy fields, the best method of irrigation, is

(A) sprinkler method (B) free flooding

(C) check method (D) furrow method

230. In a canal syphon, flow is

(A) under atmospheric pressure (B) pipe flow only

(C) with critical velocity (D) under negative pressure

231. The friction drag is primarily due to

(A) Pressure distribution over the body surface

(B) Separation of boundary layer

(C) Shear stresses generated due to viscous action

(D) Weight component in the direction of the flow

232. Infiltration capacity

(A) is constant factor

(B) changes with time

(C) changes with location

(D) changes with time and location

233. The main function of surge tanks that are connected to the penstocks in the power house is to

(A) provide a free water surface near the turbines

(B) protect penstocks from bursting

(C) acts as a reservoir

(D) provide protection against water hammer.

234. According to khosla theory, the exit gradient in the absence of down stream cut-off is

(A) zero

(B) unity

(C) infinity

(D) very large

235. The length of the hydraulic jump is found to be

(A) 10 to 15 times depth of jump

(B) 1 to 2 times depth of jump

(C) 5 to 7 times depth of jump

(D) Has no relation to the depth of jump

236. Kaplan turbine is

(A) an impulse turbine

(B) a radial flow impulse turbine

(C) an axial flow reaction turbine

(D) a radial flow reaction turbine

237. How many additional rain gauges are required in a catchment, if the error allowed in estimation of mean rainfall is to be reduced by half than the present one?

(A) Equal to the present number
(B) Twice the present number
(C) Thrice the present number
(D) Four times the present number

238. The rate of rainfall above which the rainfall volume equals the runoff volume is called

(A) W index
(B) ϕ Index
(C) Runoff coefficient
(D) Basin recharge

239. The base period of particular crop is 120 days. If the duty is 1500 ha per cumecs, the delta is about

(A) 69cm
(B) 138cm
(C) 35cm
(D) 54cm

240. Which of the following is not the mode of failure of a gravity dam

(A) Overturning failure
(B) Sliding failure
(C) Tension failure
(D) Seepage failure

241. The double mass curve is used to

(A) check the consistency of rain gauge records
(B) determine the reservoir capacity
(C) determine the number of rain gauges required
(D) determine the maximum probable precipitation

242. For the design of lined canal, the formula commonly used is

(A) Kennedy's formula
(B) Lacey's formula
(C) Manning's formula
(D) Lindley's formula

243. A filter is provided at the d/s toe of an earth dam

(A) to prevent the piping action in the dam section
(B) to reduce the seepage through the dam
(C) to reduce the uplift pressure on the dam
(D) to collect and drain out the seepage water

244. The smallest sieve size according to Indian standards is

(A) 0.0045 mm (B) 0.045 mm

(C) 0.45 mm (D) 0.154 mm

245. The critical gradient of the seepage of water in a soil medium is (Where G=Specific gravity of soil, and e=Void ratio.)

(A) $\frac{1-G}{1+e}$ (B) $\frac{G-1}{1+e}$

(C) $\frac{1+e}{1-G}$ (D) $\frac{1+e}{G-1}$

246. When the plastic limit is equal to or greater than the liquid limit, then plasticity index is

(A) negative (B) zero

(C) one (D) more than one

247. The neutral stress is

(A) transmitted through the points of contact of the interconnected particles of soil.

(B) transmitted to the soil base through the pore water.

(C) independent of the depth of water above the soil mass.

(D) due to weight of soil particles.

248. In case of coarse grained sand having high permeability and low plasticity,95% of consolidation occurs within _____ after application of load.

(A) 1 minute (B) 30 minute

(C) 1 hour (D) 2 hour

249. The coefficient of earth pressure at rest is given by

(A) $\frac{\mu}{1+\mu}$ (B) $\frac{1+\mu}{\mu}$

(C) $\frac{\mu}{1-\mu}$ (D) $\frac{1-\mu}{\mu}$

250. In case of footings in sand, if the soil pressure distribution is triangular , the maximum soil pressure is _____ the average soil pressure.

(A) equal to (B) double

(C) three times (D) four times

251. The contact pressure of flexible footing on non-cohesive soils is

(A) more in the centre than at the edges

(B) less in the centre than at the edges

(C) uniform throughout

(D) none of these

252. Negative skin friction in soil is considered when the pile is constructed through a

(A) filled material

(B) dense coarse sand

(C) over consolidated stiff clay

(D) dense fine sand

253. The angle of internal friction of round-grained loose sand is about

(A) 5˚ to 25˚

(B) 25˚ to 30˚

(C) 30˚ to 35˚

(D) 32˚ to 37˚

254. The coefficient of active earth pressure for a loose sand having an angle internal friction of 30˚,is

(A) 0.5

(B) 0.333

(C) 1

(D) 3

255. The property of the soil mass which permits the seepage of water through its interconnecting voids, is called

(A) capillarity

(B) permeability

(C) porosity

(D) none of these

256. The submerged or buoyant unit weight of soil is equal to the _____ of the unit weight of saturated soil and unit weight of water.

(A) sum

(B) difference

(C) product

(D) ratio

257. The bearing capacity factors Nc, Nq and Nr are functions of

(A) Width and depth of footing

(B) Cohesion of soil

(C) Density of soil

(D) Angle of internal friction of soil

258. CBR test on soil is type of

(A) Bearing test
(B) Shear test
(C) Penetration test
(D) None of above

259. What is the angle between two plane mirrors of an optical square?

(A) 30˚
(B) 60˚
(C) 45˚
(D) 90˚

260. The plastic limit exists in

(A) sandy soils
(B) gravel soil
(C) silty soil
(D) clay

261. The time factor corresponding to 25% degree of consolidation is given by

(A) $\pi/8$
(B) $\pi/16$
(C) $\pi/32$
(D) $\pi/64$

262. The strength of a soil is usually identified by

(A) direct tensile stress
(B) direct compressive stress
(C) ultimate shear stress
(D) effective stress

263. Which of the following is practically impermeable ?

(A) Gravel
(B) Sand mixture
(C) Coarse sand
(D) Clay

264. The soil transported by running water is called

(A) aeolian soil
(B) marine soil
(C) alluvial soil
(D) lacustrine soil

265. Which band of the electromagnetic spectrum has ability to penetrate in ground

(A) Visual
(B) Infrared
(C) Reflected infrared
(D) Microwave

266. The ratio of talweg length to the valley length is called

(A) Tortuosity
(B) Meander Ratio
(C) Sinuosity
(D) Khadirs

267. The soil having electrical conductivity less than 4000 micro-ohms/cm at 25˚C and exchangeable sodium percentage greater than 15 and pH between 8.5 -10.0 is called

(A) Saline soil
(B) Alkali soil
(C) Saline-alkali soil
(D) Normal soil

268. Uplift on the base is not an important design factor in case of

(A) Arch dams
(B) Gravity dams
(C) Earthen dams
(D) Buttress dams

269. Type of cross drainage work which is used when F.S.L of the canal is above the drainage bed level

(A) Aqueduct
(B) Syphon aqueduct
(C) Canal syphon
(D) Super passage

270. Sand drains are used to

(A) Reduce settlement
(B) Accelerate consolidation
(C) Increase permeability
(D) Transfer load

271. Spalling hammer is used for

(A) driving wooden headed chiesel
(B) carving of stones
(C) rough dressing of stones
(D) breaking small projection of stones

272. The process of mixing clay, water and other ingredients to make brick is known as

(A) pugging
(B) moulding
(C) drying
(D) kneading

273. Vanadium steel is normally used in the manufacture of

(A) axle and springs
(B) ball bearings
(C) magnets
(D) railway switches and crossings

274. The expansion and shrinkage of plywoods are comparatively very low as

(A) they are held in position by adhesives

(B) they are glued under pressure

(C) plies are placed at right angles to each other

(D) they are prepared from veneers

275. Before testing setting time of cement one should test for

(A) soundness (B) strength

(C) fineness (D) consistency

276. Polyvinyl chloride (PVC) is a

(A) thermosetting material (B) thermoplastic material

(C) elastoplastic material (D) rigid - plastic material

277. The reduction in project time normally results in

(A) decreasing the direct cost and indirect cost

(B) increasing the direct cost and decreasing the indirect cost

(C) increasing the direct cost and indirect cost both

(D) decreasing the direct cost and increasing indirect cost

278. Geotronics union in total station is

(A) visible light device (B) communication device

(C) special reflector (D) battery system

279. The angle of intersection of a curve is the angle between the

(A) back tangent and forward tangent

(B) prolongation of back tangent and forward tangent

(C) forward tangent and long chord

(D) back tangent and long chord

280. The long chord and tangent length of a circular curve of radius R will be equal if the angle of deflection is

(A) 30˚ (B) 60˚

(C) 120˚ (D) 150˚

281. The purpose of an anallactic lens in a tacheometer is to

(A) increase magnification

(B) reduce effective length of the telescope

(C) eliminate multiplying constant

(D) make staff intercept proportional to its distance from the tacheometer

282. The percentage chance of a flood with 100 year frequency of not occurring in coming 100 years is

(A) 36.6%

(B) 63.4%

(C) 100.0%

(D) None of the above

283. An open traverse can be checked by

(A) included angles

(B) deflection angles

(C) astronomical observations

(D) linear measurements

284. In theodolite, the plate bubble in the plate level will move considerably from its central position if the tripod leg is moved

(A) radially inwards

(B) radially outwards

(C) in the same direction of the bubble moved

(D) in the opposite direction of the bubble moved

285. Preliminary project report for a road project must contain

(A) the detailed estimated cost based on detailed design

(B) the several alternatives of the project that have been considered

(C) the soil survey, traffic survey, concept design and approximate cost

(D) the contract documents for inviting tenders

286. The process/phase of project management in which difference between the plan and actual performance are reviewed after the project is started is called

(A) Planning

(B) Scheduling

(C) Controlling

(D) All of the above

287. The out turn of one painter for distempering one coat per day considering 8 hour is

(A) 20 sqm
(B) 35 sqm
(C) 60 sqm
(D) 80 sqm

288. In measurement of Masonry activity, No deduction is made for ends of beams, posts, rafters, purlins etc. upto _____ in section.

(A) 0.0005 sqm
(B) 0.005 sqm
(C) 0.05 sqm
(D) 0.5 sqm

289. In measurement of Plastering activity, No deduction is made for small opening up to _____ and at the same time, no additions are made for jambs, soffits and of the sills of these opening.

(A) 0.0005 sqm
(B) 0.005 sqm
(C) 0.05 sqm
(D) 0.5 sqm

290. The unit of measurement of Railing (Height and type specified) is

(A) Meter
(B) Sq m
(C) cum
(D) Kg

291. The cement consumption per 100 sqm area for 12 mm thick plastering with cement mortar proportion of (1:4) is

(A) 18 bags
(B) 15 bags
(C) 12 bags
(D) 9 bags

292. As per IS 456:2000, the permissible limit for sulphates in water is

(A) 200 mg/l
(B) 3000 mg/l
(C) 400 mg/l
(D) 2000 mg/l

293. The vertical deflection limits may generally be assumed to be satisfied provided that the span to depth ratios are not greater than _____ for simply supported beam for span upto 10 m.

(A) 7
(B) 10
(C) 20
(D) 26

294. The unsupported length between end restraints shall not exceed _____ times the least lateral dimension of a column

(A) 45 (B) 60

(C) 75 (D) 90

295. Spacing of longitudinal bars measured along the periphery of the column shall not exceed

(A) 200 mm (B) 250 mm

(C) 300 mm (D) 350 mm

296. The standard clearance in diameter and width of slots for 20 mm nominal size of fastener is

(A) 1 mm (B) 2 mm

(C) 3 mm (D) 4 mm

297. Bolts are most suitable to carry

(A) shear (B) bending

(C) axial tension (D) shear and bending

298. The type of float which give an idea about the excess time that exists if the preceding activity ends as late as possible and the succeeding activity starts as early as possible

(A) Total float (B) Free float

(C) Independent float (D) Slack

299. A type of estimate required if there is change amounting to more than 5% of the original value due to price hiking or change in specification, but does not include any major change in structural design is called

(A) Detailed estimate (B) Revised estimate

(C) Supplementary estimate (D) Rough cost estimate

300. A soil having particles of nearly the same size is known as

(A) well graded (B) poorly graded

(C) uniformly graded (D) gap graded