

132.From the following which one is not the purpose for providing minimum concrete cover?

- A. Safe transmission of bond forces
- B. Spalling will occur
- C. Protection of steel against corrosion
- D. Adequate fire resistance
- E. None of the above

Answer:B

133.Among the following which one is not considered in serviceability limit states?

- a. Deflections which affect appearance
- b. Vibrations which causes discomfort to people
- c. Fracture or loss of stability of the structure
- d. Cracking of the concrete
- e. A&B

Answer:C

134.Design based on Ultimate limit state, we consider the following assumptions except,

- a. Maximum tensile strain in the reinforcement is taken as 0.01
- b. Plane sections remain plane
- c. Tensile strength of concrete is neglected
- d. Maximum compressive strain of concrete is 0.0035 in axial compression and 0.002 in bending

Answer:D

135.Which one is not true about doubly reinforced sections?

- a. There is both tension and compression reinforcement
- b. Become necessary when architectural requirements restrict the beam depth
- c. Promoted if the required area of the tension steel exceeds the maximum area of steel recommended by the code
- d. Compression steel reduces long term deflection and increase beam ductility
- e. None

Answer:E

136.The critical section for shear design according to EBCS provision.

- a. $d/2$ distance from face of support
- b. d distance from face of support
- c. $d/2$ distance from centre of the support
- d. d distance from the centre of the support

Answer:B

137.The section that every structure should be designed and the most feasible one is,

- a. Over reinforced
- b. Balanced
- c. Under reinforced
- d. B&C

Answer:C

138.Imagine you are designing the pavement layer thickness of certain road section for and you are getting CBR data's shown in the table below. Based on the data what is the appropriate design CBR value for this road section?

Section	1	2	3	4	5	6	7	8	9
CBR value (%)	12	8	14	6	9	9	9	11	12

- a. 10.2%
- b. 6.2%
- c. 8.2%
- d. 9.2%

Answer:C

139.In the analysis of Reinforced concrete elements Lever arm means,

- a. Distance between compression zone and tension zone
- b. Distance between C.G of compression zone and C.G of tension zone
- c. Distance between N.A and top fiber
- d. Distance between N.A and bottom fiber

Answer:B

140.In the case of rectangular footing at what direction you will provide the main reinforcement?

- a. Longer direction
- b. Shorter direction
- c. Diagonal wise
- d. None of the above

Answer:B

141.What is the use of gypsum in the clinker?

- a. To rapid the setting time
- b. To retard the setting time
- c. To increase the strength of the cement
- d. A&C

Answer:

142. When a material is stressed within the elastic limit, which of the following is true about the relationship between lateral strain and longitudinal strain,

- a. Lateral strain = $-e \times$ longitudinal strain
- b. Lateral strain = $-\mu \times$ longitudinal strain
- c. Longitudinal strain = $-\mu \times$ lateral strain
- d. Longitudinal strain = $-E \times$ lateral strain

Answer: B

143. Which of the following statement is true about an I-section of a beam acted by a shear force F on the section?

- a. The shear force at upper edge of the beam section is maximum
- b. The shear force is zero at the neutral axis of the section
- c. The shear force is maximum at the junction of the web and flange of the beam section
- d. The shear force is maximum at the neutral axis of the beam section

Answer: D

144. The coefficient k_a of active earth pressure is given by,

- a. $k_a = 1 - \tan\Phi / 1 + \tan\Phi$
- b. $k_a = 1 + \tan\Phi / 1 - \tan\Phi$
- c. $k_a = 1 - \sin\Phi / 1 + \sin\Phi$
- d. $k_a = 1 + \sin\Phi / 1 - \sin\Phi$

Answer: C

145. Macaulay's method is for,

- a. Fixed beams only
- b. Continuous beams only
- c. Simply supported beams only
- d. Cantilever beams only
- e. A&B

Answer: C

146. In the conjugate beam method the slope at any section of a given beam is equal to,

- a. Bending moment at corresponding section of conjugate beam
- b. Shear force at corresponding section of conjugate beam
- c. Deflection at corresponding section of conjugate beam
- d. None of the above

Answer: B

147. The degree of static indeterminacy of three hinged parabolic arch is,

- a. Three
- b. One
- c. Two
- d. None of the above

Answer: D

148. Segregation in concrete mix due to,

- a. More cement
- b. More aggregates
- c. More water
- d. More sand
- e. None of the above

Answer: C

149. The liquid and plastic limit exists in,

- a. Sandy soil
- b. Silty soil
- c. Gravel soil
- d. Clay soil

Answer: D

150. A simply supported beam of span l and a uniform flexural rigidity, carrying a central point load W which was distributed uniformly throughout the span as w/m , then what will be the maximum deflection?

- a. $13Wl^3/96EI$
- b. $13Wl^3/384EI$
- c. $5Wl^3/384EI$
- d. $5Wl^3/48EI$

Answer: C

151. A beam of length 6m is simply supported at its ends and carries two point loads of 48kN and 40kN at a distance of 1m and 3m respectively from the left support. What will be the magnitude of maximum deflection for this loading condition? Take $E = 2 \times 10^5 \text{ N/mm}^2$, $I = 85 \times 10^6 \text{ mm}^4$.

- a. 9.02 mm
- b. 16.75 mm
- c. 18.5 mm
- d. None of the above

Answer: B

152. What conditions will the bending moment in an arch be zero throughout,

- a. The arch is simply supported
- b. The arch is parabolic
- c. The arch carries UDL throughout the span
- d. A&B
- e. B&C
- f. None of the above

Answer: E

153. Data's like average annual daily traffic (AADT), average daily traffic (ADT) and peak hour factor (PHF) are obtained from,

- a. Conducting a study of spot speed study
- b. Conducting of parking study
- c. Conducting of volume study
- d. Conducting of travel time and delay study

Answer: C

154. Among the following, one is not correct reason for providing extra widening of pavement on curves and embankments.

- a. Rear wheels follow front wheels in shorter radius
- b. Trailer fitted on trucks, do not follow the path of truck wheels
- c. In built up areas in order to have adequate sight distance
- d. All of the above
- e. None of the above

Answer: E

155. In designing of vertical crest curve, one of the following cannot be considered as criteria for determining the length of vertical crest curve.

- a. Class of highway
- b. Stopping sight distance
- c. Head light sight distance
- d. Passing sight distance

Answer: C

156. What will be the super elevation for a certain road having the following data?, Design speed 45.2 km/hr, Radius of curve 70 m, Side friction factor 0.16 and Lateral friction factor 0.12.

- a. 0.08
- b. 0.06
- c. 0.07
- d. 0.065

Answer: C

157.If D is the diameter of upper circular portion, the overall depth of a standard egg shaped section, is

- a. D
- b. $1.25D$
- c. $1.5D$
- d. $1.75D$

Answer:C

158.Pick up the correct statement from the following

- a. Rivers, lakes, oceans and springs get water from the rains
- b. Rain water is obtained by evaporation from rivers, lakes and oceans
- c. Water remains in atmosphere as vapours
- d. Hydrologic cycle is a continuous process of evaporation and precipitation of water in atmosphere
- e. All the above

Answer:E

159.Which one of the following soil tests does not necessarily need an undisturbed sample

- a. Compaction
- b. Permeability
- c. Triaxial
- d. Consolidation
- e. All

Answer:A

160.Which one of the following exploration methods is most commonly practiced in Ethiopia

- a. Penetration tests
- b. Boring
- c. Test pit
- d. Geophysical method

Answer:C

161.With the increase of width, B of a strip footing, the ultimate bearing capacity of cohesive soil

- a. Increases
- b. Decreases
- c. Remains constant
- d. None

Answer:C

162. In design of which structure does uplift have a little significance?

- a. Highway
- b. Villa
- c. Retaining wall
- d. Swimming pool
- e. Multi-story building

Answer: E

163. Lime stabilization is very effective in treating

- a. Sandy soils
- b. Silty soils
- c. Non-plastic soils
- d. Plastic clayey soils

Answer: D

164. Void ratio of a soil mass can

- a. Never be greater than unity
- b. Be zero
- c. Take any value greater than zero
- d. Take values greater than 0 and 1 only

Answer: C

165. Choose the correct statement from the following.

- a. Unit weight of dry soil is greater than unit weight of wet soil.
- b. For dry soils, dry unit weight is less than total unit weight.
- c. Unit weight of soil increases due to submergence in water.
- d. Unit weight of soil decreases due to submergence in water.

Answer: D

166. If the water content of a fully saturated soil mass is 100%, then the voids ratio of the sample is

- a. Less than specific gravity of soil
- b. Equal to specific gravity of soil
- c. Greater than specific gravity of soil
- d. Independent of specific gravity of soil

Answer: B

167. Which of the following statement is correct?

- a. Uniformity coefficient represents the shape of the particle size distribution curve.
- b. For a well graded soil, both uniformity coefficient and coefficient of curvature are nearly unity.
- c. A soil is said to well graded if it has most of the particles of about the same size.
- d. None of the above.

Answer: D

168. Coefficient of compressibility is

- a. Constant for any type of soil
- b. Different for different types of soils and also different for soils under different states of consolidation.
- c. Different for different types of soils but same for soils under different states of consolidation.
- d. Independent of type of soil but depends on stress history of soil.

Answer: B

169. The total and effective stresses at a depth of 5m below the top level of water in swimming pool are respectively

- a. Zero and zero
- b. 0.5 Kg/cm^2 and zero
- c. 0.5 Kg/cm^2 and 0.5 Kg/cm^2
- d. 1 Kg/cm^2 and 0.5 Kg/cm^2

Answer: B

170. The property of stream function ψ is :

- a. ψ is constant everywhere on any stream line
- b. the flow around any path in the fluid is zero for continuous flow
- c. the rate of change of ψ with distance in an arbitrary direction, is proportional to the component of velocity normal to that direction
- d. All the above.

Answer: D

171. The maximum vacuum created at the summit of a syphon is

- a. 2.7 m of water
- b. 7.4 m of water
- c. 5.5 m of water
- d. One.

Answer: B

172.The shear stress distribution in viscous fluid through a circular pipe is

- a. maximum at the centre
- b. maximum at the inside of surface
- c. same throughout the section
- d. None of these.

Answer:C

173.Among the following which one are not true about two way solid slabs.

- a. When longer side greater than two times shorter side
- b. Load distribution is in two orthogonal direction
- c. Main reinforcement is provided for both sides of the slab
- d. When longer side lesser than two times shorter side
- e. None of the above, except D

Answer:A

174.The member of rigid frames due to an external loading can response by (subjected to) all except,

- a. Bending moment
- b. Shear force
- c. Axial compression or tension
- d. None of the above

Answer:D

175.Shrinkage of concrete affected by,

- a. Humidity and temperature
- b. Water cement ratio
- c. Duration of loading
- d. Percentage of steel
- e. All of the above

Answer:C

176.In the case of under reinforced section which will fail first,

- a. Concrete
- b. Aggregates
- c. Steel
- d. None of the above

Answer:C

177.If moment of inertia increases what will be the moment of resistance value,

- a. It will decrease
- b. It will increase
- c. No change
- d. All are correct

Answer:B

178.The minimum water content at which the soil just begin to crumble and rolled in threads of diameter 3mm, is known as,

- a. Liquid limit
- b. Plastic limit
- c. Shrinkage limit
- d. Permeability limit

Answer:B

179.Principal planes are subjected to,

- a. Normal stresses only
- b. Tangential stresses only
- c. Both A&B
- d. None of the above

Answer:A

180.Hydrostatic pressure on a dam depends upon its

- a. Length
- b. Depth
- c. Shape
- d. Material
- e. Both B and C

Answer:E

181.A pipe of 0.1 m^2 cross sectional area suddenly enlarges to 0.3 m^2 cross-sectional area. If the discharge of the pipe is $0.3 \text{ m}^3 / \text{sec}$, the head loss is

- a. $2/g$ m of water
- b. $g/2$ m of water
- c. $1g$ m of water
- d. $(g)^{1/2}$ m of water.

Answer:A

182. An ideal flow of a liquid obeys
- Continuity equation
 - Newton's law of viscosity
 - Newton's second law of motion
 - dynamic viscosity law,

Answer:A

183. Capillary rise of water is
- directly proportional to surface tension
 - inversely proportional to water density
 - inversely proportional to diameter of the tube
 - All of these

Answer:D

184. Which one of the following is not the overturning force of the gravity dam if the point of rotation is at the toe,
- Uplift pressure
 - Weight of the dam
 - Upstream hydro static pressure
 - All

Answer:B

185. In a canal syphon, the flow is
- under atmospheric pressure
 - pipe flow
 - with critical velocity
 - under negative pressure

Answer:B

186. In an inclined pipe, the pressure difference at its two ends is due to
- sudden head drop at inlet
 - exit head drop
 - frictional loss head
 - all the above.

Answer:D

187. Though angle of deviation of liquid is more in internal mouth piece, the contraction of the jet, is
- more in the internal mouth piece
 - less in the internal mouth piece
 - equal to external mouth piece
 - none of these

Answer:A

188. The pressure rise due to water hammer depends upon

- a. the velocity of flow of water in the pipe
- b. the length of pipe
- c. time taken to close the valve
- d. the elasticity of the pipe material
- e. All of above.

Answer: E

189. Pick up the correct statement from the following regarding the pressure conduits

- a. Pressure conduits are permitted to run 3/4 th full
- b. Pressure conduits are always laid along down grades
- c. The hydraulic gradient line always coincides the invert of the conduit
- d. None of these.

Answer: D

190. If D is the diameter of upper circular portion, the overall depth of a standard egg shaped section, is

- a. D
- b. $1.25D$
- c. $1.5D$
- d. $1.75D$

Answer: C

191. If discharge of a pump is 0.16 cumecs, the economic diameter of pipe, is

- a. 0.488m
- b. 4.88cm
- c. 48.8cm
- d. 4.88m

Answer: A

192. Pick up the incorrect statement from the following :

- a. The rate of flow of water through a unit cross-sectional area under a unit hydraulic gradient, is called coefficient of permeability
- b. The rate of flow of water through a vertical strip of the aquifer of unit width and full depth under a unit hydraulic gradient, is called coefficient of transmissibility
- c. The flow of water through aquifers, is governed by the Darcy's law
- d. The term 'transmissibility' was introduced by Meinzer
- e. The ratio of coefficient of transmissibility and coefficient of permeability, is equal to the depth of aquifer through which water flows

Answer: D

193. Yield of a drainage basin is

- a. run off of the area expressed as instantaneous rate
- b. average run off over a short period
- c. total volume of water flowing annually
- d. all the above.

Answer: C

194. An aquiclude is

- a. a non artesian aquifer
- b. an artesian aquifer
- c. a confined bed of impervious material between aquifers
- d. a large water body under ground.

Answer: C

195. Pick up the correct statement from the following

- a. Rivers, lakes, oceans and springs get water from the rains
- b. Rain water is obtained by evaporation from rivers, lakes and oceans
- c. Water remains in atmosphere as vapours
- d. Hydrologic cycle is a continuous process of evaporation and precipitation of water in atmosphere
- e. All the above

Answer: E

196. Surge tanks are used

- a. for storage water
- b. to increase the velocity in a pipeline
- c. to guard against water hammer.
- d. as overflow valves

Answer: C

197. The yield of a rapid gravity filter as compared to that of slow sand filter, is

- a. 10 times
- b. 15 times
- c. 20 times
- d. 30 times

Answer: D

198. Pick up the correct statement from the following regarding the pressure conduits

- a. Pressure conduits are permitted to run 3/4 th full
- b. Pressure conduits are always laid along down grades
- c. The hydraulic gradient line always coincides the invert of the conduit
- d. None of these.

Answer: D

199.If 2% solution of a sewage sample is incubated for 5 days at 20°C and depletion of oxygen was found to be 5 ppm, B.O.D. of the sewage is

- a. 200 ppm
- b. 225 ppm
- c. 250 ppm
- d. None of these

Answer: C

200.If D is the diameter of upper circular portion, the overall depth of a standard egg shaped section, is

- a. D
- b. $1.25D$
- c. $1.5D$
- d. $1.75D$

Answer: C