

2012

PART 03 – CIVIL ENGINEERING AND GEOINFORMATICS

(Answer ALL questions)

76. Point of contra-flexure is a point in which

- 1) Bending moment changes its sign
- 2) Shear force changes its sign
- 3) Deflection is zero
- 4) All of the above

77. The deflection at the free end of the cantilever of span L and carrying a point load W at the free end is

- 1) $WL^3/3EI$
- 2) $WL^3/48EI$
- 3) $WL^2/3EI$
- 4) $WL^4/3EI$

78. Euler's formula is applicable to

- 1) Short column
- 2) Medium column
- 3) Long column
- 4) Both 1 and 2

79. The strain energy stored by the body within elastic limit when loaded externally is called

- 1) Resilience
- 2) Proof resilience
- 3) Modulus of resilience
- 4) None of the above

80. A three hinged arch is

- 1) Statically determinate
- 2) Statically in-determinate
- 3) Both 1 and 2
- 4) None of the above

81. The volume (cu.m) of a bag of cement is about

- 1) 0.035
- 2) 0.053
- 3) 0.35
- 4) 0.53

82. The minimum grade of structural concrete as per IS 456-2000 is

- 1) M15
- 2) M20
- 3) M25
- 4) M40

83. Allowable average shear stress in an unstiffened web for beams made of mild steel is

- 1) 250 MPa
- 2) 165 MPa
- 3) 150 MPa
- 4) 100 MPa

84. For a dense sand, the relative density is

- 1) between 35 and 65
- 2) between 65 and 85
- 3) between 85 and 100
- 4) greater than 100

85. The seepage pressure is proportional to

- 1) hydraulic gradient
- 2) unit weight of water
- 3) length of the specimen
- 4) all of the above

86. An isobar is a curve which joins point of

- 1) equal horizontal stress
- 2) equal vertical stress
- 3) zero vertical stress
- 4) maximum vertical stress

87. With an increase in the liquid limit, compression index

- 1) decreases
- 2) increases
- 3) remain constant
- 4) may increase or decrease

88. In-situ vane shear test is used to measure the shear strength of

- 1) very soft and sensitive clays
- 2) stiff and fissured clays
- 3) sandy soils
- 4) all of the above

89. The allowable soil pressure for foundations in cohesive soils is generally controlled by

- 1) settlements
- 2) bearing capacity
- 3) both 1 and 2
- 4) neither 1 nor 2

90. The negative skin friction on a pile develops when the

- 1) soil in which it is driven is sandy soil
- 2) soil surrounding it settles more than the pile
- 3) ground water table rises
- 4) soil near the tip is clay

91. As per IRC, the maximum width of the vehicle should be

- 1) 2 m 2) 2.44 m
- 3) 3.8 m 4) 1.58 m

92. Extra widening of a road is not required when the radius is

- 1) less than 300 m 2) more than 300 m
- 3) less than 460 m 4) more than 460 m

93. Abrasion test is conducted to find the

- 1) hardness of aggregate
- 2) toughness of aggregate
- 3) durability of aggregate
- 4) strength of aggregate

94. Camber in the road is provided for

- 1) Effective drainage
- 2) Counteracting the centrifugal force
- 3) Having proper sight distance
- 4) All of the above

95. Primary function of the ballast is to

- 1) Maintain the gauge
- 2) Provide elasticity
- 3) Conceal and makeup irregularities of sleepers
- 4) Prevent growth on vegetation or formation

96. When subjected to a shear stress, a fluid

- 1) deforms continuously no matter how small the shear stress is
- 2) deforms continuously only for large shear forces
- 3) undergoes static deformation
- 4) deforms continuously only for small shear stresses

97. In an isothermal atmosphere the pressure

- 1) decreases linearly with elevation
- 2) decreases exponentially with elevation
- 3) increases logarithmically with elevation
- 4) varies inversely as the density

98. A hot-wire anemometer is a device to measure the

- 1) boundary pressure
- 2) mean velocity of flow
- 3) boundary shear stress
- 4) turbulent velocity fluctuation

99. Kharif crops are sown and harvested during

- 1) October to March

- 2) February and June
- 3) April and September
- 4) January and May

100. The specific capacity of a well is defined as

- 1) drawdown per unit discharge
- 2) discharge per unit drawdown
- 3) drawdown per certain given discharge
- 4) discharge per certain given drawdown

101. A pumped storage plant is the one which is

- 1) used as the base load plant
- 2) the same as the run of river plant
- 3) used as a peak load plant
- 4) a high head plant

102. Water which may be utilised by the plants is available in the soil mainly in the form of

- 1) gravitational water 2) capillary water
- 3) hygroscopic water 4) chemical water

103. The amount of irrigation water required to meet the evapotranspiration needs of the crop during its full growth is

- 1) effective rainfall
- 2) consumptive use
- 3) consumptive irrigation requirement
- 4) net irrigation requirement

104. An aeration tank with a volume of 1590m³ receives a primary effluent flow rate of 8900 m³/d. The mixed liquor suspended solids concentration is 2480 mg/L. If the primary effluent BOD concentration is 184 mg/L, the current F/M ratio is

- 1) 0.285 2) 0.415
- 3) 0.515 4) 0.845

105. The acceptable limit for nitrates in drinking water is

- 1) 45 mg/L 2) 1.0 mg/L
- 3) 75 mg/L 4) 600 mg/L

106. The greenhouse gases causing global warming are

- 1) CO₂, CH₄, NO, CFC's
- 2) CO₂, CH₄, NO₂, CFC's
- 3) CO, CH₄, N₂O, CFC's
- 4) CO₂, CH₄, N₂O, CFC's

107. Cyclone is an air pollution control device meant for removal of

- 1) Sulphur dioxide
- 2) Oxides of nitrogen
- 3) Particulate matter
- 4) VOC's

108. As per the Indian standards in respect of noise, the limit (night time) for silence zone is

- 1) 30 dBA
- 2) 40 dBA
- 3) 50 dBA
- 4) 60 dBA

109. The first derivative of a Gridded DEM is

- 1) drainage network
- 2) slope
- 3) aspect
- 4) viewshed

110. A total station is an instrument to measure the

- 1) Distance between two stations
- 2) Angle between two lines
- 3) Azimuth of line
- 4) Distance and angles between stations

111. An EDM will not use the following EMR for measurement

- 1) optical waves
- 2) sound waves
- 3) microwaves
- 4) infra red waves

112. The acronym for GPRS is

- 1) Geodetic Positioning Radar System
- 2) Global Positioning Resultant System
- 3) Ground Penetrating Radar System
- 4) Global Place Radiation System

113. Representing ridge lines is easier in

- 1) Gridded DEM data structure
- 2) TIN data structure
- 3) Raster data structure
- 4) None of the above

114. MrSID format is primarily used for

- 1) Vector Data Storage
- 2) Raster Data Storage
- 3) Network Analysis
- 4) Proximity Analysis

115. For penetrating the cloud cover the preferred satellite sensor is

- 1) Optical sensor
- 2) Thermal infrared
- 3) Microwave
- 4) NIR

116. Two perpendicular axes x and y of a section are called principal axes when

- 1) Moment of inertia about these axes are equal ($I_x = I_y$)
- 2) Product moment of inertia (I_{xy}) is zero
- 3) Product of moments of inertia is ($I_x \times I_y$) is zero
- 4) None of the above

117. The settling velocity of the particle in the settling tank increases if

- 1) Particle size is decreased
- 2) Surface area is increased
- 3) Depth of tank is increased
- 4) Particle size is increased

118. The allowable soil pressure for foundations in cohesive soils is generally controlled by

- 1) Settlements
- 2) Bearing capacity
- 3) Both 1 and 2
- 4) Neither 1 nor 2

119. Interchange file formats in GIS are used for

- 1) Raster to vector conversion
- 2) Interchange data between TIN and networks
- 3) To store graphics
- 4) Export/import utility

120. Buffering operation is categorised under

- 1) Proximity functions
- 2) Interpolation functions
- 3) Perspective view functions
- 4) Topographic functions

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