SANKALP EDUCATION

Marks: 200 **Full Length Paper - 2** **Time: 120 minutes**

Q1. The type of surveying used to determine the details of boundaries, fields etc, is known as

(a) City Surveying
(b) Geographical Surveying
(c) Cadastral Surveying
(d) Topographical Surveying

Q2. Using RF of 1/5000, the distance between two points A and B on the map was found to be 500m. The distance between the same points when measured with a scale of RF 1/1000 will be?

(a) 1000 m
(b) 100 m
(c) 10 m
(d) 10000 m

Q3. When the length of chain used in measuring distance is longer than the standard length, the error in measured distance will be

(a) Positive Error
(b) Negative Error
(c) Compensating Error
(d) None of these

Q4. Reciprocal ranging is applied when

(a) Both ends of survey line are not inter-visible
(b) A high intervening ground is found in between two end stations
(c) Long distance between two end stations
(d) All of the above

Q5. Which of the following is obstacle to chaining but not to ranging?

(a) River
(b) Lake
(c) Pond
(d) Hill

Q6. When the image formed by the objective is not situated in the plane of cross-hairs

(a) The cross-hair should be adjusted
(b) The eye-piece should be focused
(c) The objective should be focused
(d) The parallax should be removed

Q7. An angle measured clockwise from the preceding survey line to the following survey line is called

(a) Direct angle
(b) Vertical angle
(c) Deflection angle
(d) Horizontal angle

Q8. Which of the following statement is incorrect?

(a) The distance measured parallel to the north-south line is called latitude of the line
(b) The distance measured parallel to the east-west line is called departure of the line
(c) The latitude is positive when measured downward or southward
(d) The departure is negative when measured to the left or westward

Q9. The method of intersection in plane tabling is commonly used for

(a) Locating the distance and inaccessible points
(b) Locating the broken boundaries
(c) Locating the points which may be used subsequently as the instrument station
(d) All of these

Q10. The method of plane tabling used commonly for establishing the instrument stations only is a

(a) Method of Radiation
(b) Method of Intersection
(c) Method of traversing
(d) Method of Resection

Q11. The point where plumb line dropped from the front nodal point pierces the photograph is known as

(a) Principal point
(b) Focal point
(c) Nodal point
(d) Nadir point

Q12. A camera having focal length of 20 cm is used to take a vertical photograph to a terrain having an average elevation of 1500m. What is the height above sea at which an air-craft must fly in order to get the photograph at a scale of 1:8000?

(a) 1500 m
(b) 3100 m
(c) 1600 m
(d) 4600 m

Q13. Two theodolite method of setting out a curve involves

(a) Linear measurements only
(b) Angular measurements only
(c) Both A & B
(d) None of these

Q14. If D is the degree of curve, R is the radius of curve, what will be the relation between R and D for given length of chord equal to 30m?

(a) R= 1520/D
(b) R= 1720/D
(c) R= 4500/D
(d) R= 1320/D

Q15. The error which follows the mathematical law of probability is

(a) Mistakes
(b) Compensating Error
(c) Systematic Error
(d) Accidental Error

Q16 Minimum cement content for mild environment using 10mm size aggregate, shall be ..... kg per cubic meter of concrete

(a) 300
(b) 320
(c) 340
(d) 360

Q17. Maximum W/C ratio for RCC work

(a) 0.30
(b) 0.50
(c) 0.45
(d) 0.60

Q18. Effective span of end span of a continuous beam supported on walls is

(a) Clear span + effective depth
(b) Clear span + 1/2 effective depth
(c) Clear span + support width
(d) Center to center distance

Q19. Torsion reinforcement is provided in form of

(a) Development length
(b) Stirrups
(c) Minimum Longitudinal reinforcements
(d) Side face reinforcement

Q20. Diameter of lateral ties should not be less than

(a) 1/4 times dia. of largest longitudinal bar
(b) 1/2 times dia. of largest longitudinal bar
(c) 1/4 times dia. of smallest longitudinal bar
(d) 1/2 times dia. of smallest longitudinal bar

Q21. In case of core test, the average strength of core should be ..... of cube strength

(a) At least 50%
(b) At least 85%
(c) At least 100%
(d) At least 1.5 times

Q22. In case of ultrasonic pulse velocity test, we get

(a) Equivalent Compressive Strength
(b) Qualitative results
(c) Both A & B
(d) Neither A nor B

Q23. In a T – beam side face reinforcement shall be

(a) 1% Cross sectional area
(b) 0.1% Cross sectional area
(c) 0.15% Cross sectional area
(d) 0.1% of web area

Q24. Pitch of ties in a column of size 230mmx 450mm for seismic zone II shall be equal to

(a) 230mm
(b) 16 times dia. of smallest longitudinal bars
(c) Least of (a) & (b)
(d) None of these

Q25. A beam is called a deep beam if it L/D ratio is ..... in simply supported condition and ..... in continuous beam structure

(a) 2,2.5
(b) 2,2
(c) 2.5,2
(d) 1.5,2.5

Q26. Punching shear strength of concrete in Limit state method is taken as

(a) $0.7\sqrt{f_{ck}}$
(b) $0.25\sqrt{f_{ck}}$
(c) $0.16\sqrt{f_{ck}}$
(d) $5000\sqrt{f_{ck}}$

Q27. The surface crack width in case of structures in contact with groundwater should not exceed,

(a) 1 mm (b) 0.3 mm
(c) 0.1 mm (d) 0.2 mm

Q28. Which grade of concrete is also represented as mix with volume proportion 1:2:4

(a) M15
(b) M10
(c) M25
(d) M30

Q29. In self compacted concrete, slump will be

(a) 150 – 200 mm slump
(b) Collapse slump
(c) Flowing slump

(d) Shear slump

Q30. Moist curing of concrete in case of concrete made by OPC and PPC shall be ..... days and ..... days respectively

(a) 7,14 (b) 10,14

(c) 7,10 (d) 14,28

Q31. The maximum compressive strain in concret subjected to combined axial compression and bending case is given as

(a) 0.0035

(b) 0.002

(c) $0.002 + 0.87f_y/E_s$

(d) 0.002+ 0.75x Strain of most compressed fibre

Q32. Equivalent shear force in case of combined shear and torsion, depends on?

(a) Depth of section

(b) Width of section

(c) Length of element

(d) All of the Above

Q33. Workability of concrete is inversely proportional to

(a) w/c ratio

(b) Size of aggregate

(c) Time of Transit

(d) Amount of superplasticizer

Q34. Which admixture is added to concrete to improve its ability to resist freezing and thawing of concrete?

(a) Retarding admixtures

(b) Accelerating admixtures

(c) Super plasticizers

(d) Air-entraining admixtures

Q35. Increase in quantity of C_3S will convert the ordinary cement to which of the below

(a) High Strength cement

(b) Rapid Hardening Cement

(c) Slow setting cement

(d) Low Heat Cement

Q36. Kelly Ball Penetration Test is carried out for

(a) Consistency & Workability of fresh concrete

(b) Hardness of set concrete

(c) Brittleness of set concrete

(d) Durability of set concrete

Q37. What would be the impact on rate of creep in Concrete under the effect of constant stress

(a) Remains constant with time

(b) Increases with time

(c) Reduces with time

(d) Independent of time

Q38. Which method of determination of water content can be used only when specific gravity of soil solids is known in advance.

(a) Pycnometer method

(b) Calcium carbide method

(c) Sand bath method

(d) Oven drying method

Q39. The shape of the particle size curve can be represented by

(a) C_u

(b) C_c

(c) I_p

(d) I_f

Q40. For determination of liquid limit in laboratory the soil sample passing through_____ IS sieve Is used

(a) 75µ

(b) 425µ

(c) 100µ

(d) 200µ

Q41. From the plot of water content vs. no of blows on semi log graph the liquid limit is obtained as water content corresponding to ____ blows.

(a) 15

(b) 10

(c) 20

(d) 25

Q42. Porosity for soil lies in the range of

(a) 0 to 1

(b) 0 to ∞

(c) 1 to 2

(d) 0 to 0.1

Q43. When soil is at liquid limit, ($W = W_L$) , I_c= ____

(a) 0

(b) 1

(c) ∞

(d) None of the above

Q44. Density index is the ratio of _____

(a) $e_{max} - e/e_{max} - e_{min}$

(b) $e - e_{max}/e_{max} - e$

(c) $e_{max} - e_{min}/e_{max} - e$

(d) $e_{min} - e/e_{max}$

Q45. A soil having liquid limit= 60% and Plasicity Index (Ip)=40 the given soil can be classified as _____as per Casagrande plasticity chart

(a) CL (b) CH
(c) SM (d) CL-ML

Q46. Casagrande equation for IS plasticity chart to determine I_P is _____

(a) 0.63(W_L-20)
(b) 0.9(W_L-40)
(c) 0.73(W_L-20)
(d) 0.73(W_L-W_P)

Q47. Generally, honeycomb structure is observed in case of _____ deposits

(a) Silt
(b) Clay
(c) Boulders
(d) Gravels

Q48. The _____ clay minerals has high swelling and shrinkage characteristics

(a) Kaolinite
(b) Montmorillonite
(c) Illite
(d) Non of the above

Q49. The liquid limit of soil mass is 20% and it's plastic limit is 25% then plasticity index of soil is

(a) 5
(b) -5
(c) 0
(d) None of the above

Q50. A flownet is drawn for a weir ,the total head lose is 6m, number of potential drop is 10 and length of flow path for the last square is 1 m. The exit gradient is_____

(a) 0.7
(b) 1.6
(c) 1
(d) 0.6

Q51. With an increase in the liquid limit, compression index

(a) Decreases
(b) Increases
(c) Remains Constant
(d) May increase or decrease

Q52. The exit gradient is equal to ratio of

(a) Slope of flow line
(b) Ratio of head loss at exit to the flow length at exit
(c) Ratio of Total head loss to the flow length at exit
(d) Ratio of Total head loss to total flow length

Q53. A flow net has 6 flow channels and 24 equipotential drops, the shape factor is

(a) 4
(b) 1/4
(c) 144
(d) 10

Q54. Two soils A and B have 85% and 65% respectively as the degree of saturation. The permeability of A _____than that of B.

(a) More
(b) Less
(c) Equal to
(d) None of the above

Q55. For a standard compression test the mass of hammer and the drop of hammer are as follows:

(a) 2.6 Kg and 450 mm
(b) 2.6 Kg and 310 mm
(c) 4.8 Kg and 310 mm
(d) 4.89 Kg and 450 mm

Q56. When drainage is not permitted throughout the triaxial test, the test is known as

(a) Quick Test
(b) Slow Test
(c) Consolidated Undrained Test
(d) None of the above

Q57. The O.C.R. (Over Consolidation Ratio) of an Normally consolidated clay is

(a) Equal to 1
(b) More than 1
(c) Less than 1
(d) Less than Equal to 1

Q58. The permeability of a soil deposit in-situ can be best obtained by

(a) Falling head permeameter
(b) Constant head permeameter
(c) Pumping test
(d) Yield test

Q59. The hydraulic head that would produce a quick condition in a sand stratum of thickness of 2 m, if G = 2.7 and e = 0.7, is

(a) 0.5
(b) 2
(c) 1
(d) 2.5

Q60. Lacustrine soils are soils

(a) transported by rivers and streams
(b) transported by glaciers
(c) deposited in sea beds
(d) deposited in lake beds

Q61. In an undrained compression test, the sample failed at a deviator stress of 200 kN/m^2 when the cell pressure was 100 kN/m^2. The cohesion intercept in this case would be

(a) 200 kN/m^2
(b) 100 kN/m^2
(c) 300 kN/m^2
(d) 50 kN/m^2

Q62. Westergaard's analysis for stress distribution beneath loaded areas is applicable to

(a) Sandy soils
(b) Clayey soils
(c) Stratified soils
(d) Silty Soils

Q63. 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

Q64. The correct sequence of minerals in soil in an increasing order is

(a) Silica, Kaolinite, Illite, Montmorillonite
(b) Kaolinite, Illite, Montmorillonite, Silica
(c) Montmorillonite, Silica, Kaolinite, Illite
(d) Kaolinite, Illite, Silica, Montmorillonite

Q65. Oedometer is used to calculate which of the following soil parameter

(a) Compressibility
(b) Permeability
(c) Specific gravity
(d) Particle size analysis

Q66. The total, neutral and effective vertical stresses (in t/m^2) at a depth of 5m below the surface of a fully saturated soil deposit with a saturated density of 2 t/m^3 would respectively be

(a) 5, 5 and 10
(b) 5, 10 and 5
(c) 10, 5 and 10
(d) 10, 5 and 5

Q67. A shear test was conducted on a soil sample. At failure, the ratio of $(P_1 - P_3)/2$ to $(P_1 + P_3)/2$ was equal to 1. Which one of the following shear test represents this condition?

(a) Drained triaxial compression test
(b) Undrained triaxial compression test
(c) Undrained shear test
(d) Unconfined compression test

Q68. Two footings, one circular and the other square, are founded on the surface of purely cohesionless soil. The diameter of the circular footing is the same as that of the side of the square footing. The ratio of the ultimate bearing capacities of the square footing will be

(a) 1
(b) 1.3
(c) 1.33
(d) 0.75

Q69. The load carrying capacity of an individual friction pile is 200 kN. What is the total load carrying capacity of a group of 9 such piles with a group efficiency factor of 0.8?

(a) 1800 kN
(b) 1640 kN
(c) 1440 kN
(d) 900 kN

Q70. The permissible stress in axial tension in steel member on the net effective area of the section shall not exceed the following value (Note: f_y is the yield stress)

(a) 0.8fy
(b) 0.75fy
(c) 0.6fy
(d) 0.5fy

Q71. Lacing bar shall be inclined at an angle θ which should be between

(a) 20^0-50^0
(b) 30^0-60^0
(c) 40^0-70^0
(d) 50^0-80^0

Q72. The slenderness ratio of lacing bar should not exceed

(a) 135
(b) 145
(c) 155
(d) 165

Q73. The thickness of battens shall be

(a) 1/10th of effective length of batten
(b) 1/15th of effective length of batten

(c) 1/10th of the distance between the innermost connecting lines of rivets, bolt or welds

(d) 1/15th of the distance between the innermost connecting lines of rivets, bolt or welds

Q74. The design compressive stress of an axially loaded compression member in IS-800-2007 is given by

(a) Ranking formula

(b) Secant formula

(c) Merchant Ranking formula

(d) Perry Robertson formula

Q75. An example of light moment connection is

(a) framed connection

(b) unstiffened seat connection

(c) clip angle connection

(d) split beam connection

Q76. A circle is marked on a mild steel plate and then it is subjected to two normal stresses is a mutually perpendicular direction along with simple shear. After the loading, the circle

(a) assumes the shape of a ellipse

(b) assumes the shape of a cycloid

(c) remains as a circle

(d) assumes the shape of a square

Q77. 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

Q78. Percentage of imposed load to be considered is_____ in seismic weight consideration for Imposed uniformly distributed floor load above 3 kN/m^2

(a) 25

(b) 30

(c) 50

(d) 75

Q79. Gantry girders are designed to resist

(a) lateral loads

(b) longitudinal loads and vertical loads

(c) lateral, longtidinal and vertical loads

(d) lateral and longitudinal loads

Q80. Minimum pitch of the riverts shall not be less than

(a) 1.5d

(b) 2.0d

(c) 2.5d

(d) 3.0d

Q81. Flexibility method is also called as:

1) force method
2) compatibility method
3) consistent deformation method

(a) Only1

(b) 1 and 2

(c) 1 and 3

(d) 1,2 and 3

Q82. Matrix stiffness method

1) forms the basis for computerization
2) yields the displacements and forces in one go
3) can be used to analyse both determinate and indeterminate structure

(a) 1 and 2

(b) 1 and 3

(c) 2 and 3

(d) 1,2 and 3

Q83. Deflection of simply supported beam at mid-span under a concentrated load is

(a) $\frac{WL^3}{48EI}$

(b) $\frac{WL^2}{8EI}$

(c) $\frac{WL^3}{3EI}$

(d) $\frac{WL^3}{96EI}$

Q84. Wiliot-Mohr diagram is used to find

(a) displacement in a structure

(b) settlement of a structure

(c) strain energy in a structure

(d) principal stresses in a structure

Q85. Unit load method is based on

(a) Internal Strain energy

(b) Theorem of Minimum Potential Energy

(c) Theorem of Minimum Deflection

(d) Castigliano's theorem

Q86. Maximum deflection at mid-span of a simply supported beam with UDL is

(a) $\frac{WL^3}{48EI}$

(b) $\frac{4WL^3}{48EI}$

(c) $\frac{5WL^4}{38EI}$

(d) $\frac{5WL^4}{48EI}$

Q87. Structures having more reactions than that required for necessary and sufficient conditions are

1. **Hyperstatic**
2. **Determinate**
3. **Indeterminate**
4. **Hypostatic**

(a) Only 1
(b) 1 and 3
(c) Only 2
(d) 2 and 4

Q88. Statistically indeterminate beam can be solved by:

1) **Displacement Method**
2) **Energy Method**
3) **Matrix Method**
4) **Four moment equation Method**

(a) 1 and 2
(b) 2 and 3
(c) 1,2 and 3
(d) All of the above

Q89. Which of the following yield criteria are suitable for ductile and isotropic material?

1) **Maximum normal stress theory**
2) **Maximum shear stress theory**
3) **Maximum energy distortion theory**
4) **Maximum compressive theory**

(a) 1 and2
(b) 2 and 3
(c) 1,2 and 3
(d) All of the above

Q90. Which one of the following is conservative failure theory for brittle material?

(a) Maximum normal stress theory
(b) Maximum shear theory
(c) Coulomb-Mohr theory
(d) St. Venant theory

Q91. State true or false

1) **Any two orthogonal surfaces are sufficient to completely specify the principal stresses for a biaxial state of stress.**
2) **Only one surface is required to specify the maximum shear stress completely.**

(a) 1 is true but 2 is false
(b) 1 is false, but 2 is true
(c) both 1 and 2 are true
(d) both 1 and 2 are false

Q92. Torsional failure surface of ductile material occurs at

(a) Transverse Plane
(b) 60^0 to transverse plane
(c) 45^0 to transverse plane
(d) Any random plane

Q93. 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

Q94. The point of contraflexure primarily occurs in

(a) Cantilever beams
(b) Simply supported beams
(c) Overhanging beams
(d) Fixed beams

Q95. 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) $\pi(D - d)^4/36$

Q96. 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) $[d_2/d_1]^4$

Q97. Two people weighing W each 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

Q98. 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) $K_1 \leq K_2$

Q99. The centre of gravity of a semi-circle lies at a distance of from its base measured along the vertical radius

(a) $4r/3\pi$
(b) $8r/3$
(c) $3r/4\pi$
(d) $3r/8$

Q100. If the resultant of two forces has the same magnitude as either of the forces, then the angle between the two forces is

(a) 90^0
(b) 60^0
(c) 120^0
(d) 30^0

Q101. If a number of forces are acting at a point, their resultant will be inclined at an angle ϕ with the horizontal, such that

(a) $\tan \phi = \Sigma V \times \Sigma H$
(b) $\tan \phi = \Sigma H / \Sigma V$
(c) $\tan \phi = \sqrt{\Sigma V + \Sigma H}$
(d) $\tan \phi = \Sigma V / \Sigma H$

Q102. When a bar is subjected to a uniform change of temperature and its deformation is prevented, the stress induced in the bar is

(a) shear stress
(b) compressive stress
(c) tensile stress
(d) bending stress

Q103. Section shear centre is point through which ,if the resultant load passes the section will not be subjected to any

(a) Bending
(b) Tension
(c) Compression
(d) Torsion

Q104. The Young's modulus of a material is 125 GPa and Poission's ratio is 0.25. The modulus of rigidity of the material is

(a) 100 GPa
(b) 80 GPa
(c) 50 GPa
(d) 30 GPa

Q105. The number of simultaneous equations to be solved in the slope deflection method is equal to

(a) The degree of static indeterminacy
(b) The degree of kinematic indeterminacy
(c) the difference of the degree of statically indeterminacy and kinematic indeterminacy
(d) the number of joints in the structure

Q106. A single bay portal frame of height 'h' fixed at the base is subjected to a horizontal displacement Δ at the top. The base moment developed is proportional to

(a) $1/h$
(b) $1/h^2$
(c) $1/h^3$
(d) $1/h^4$

Q107. Influence line Diagram for redundant structures can be obtained by

(a) Castigliano's Theorem
(b) Muller-Breslau Principle
(c) Unit Load Theorem
(d) All of the above

Q108. Free floats is mainly used to

(a) Identify the activities which can be delayed without affecting the total float of the preceding activities
(b) Identify the activities which can be delayed without affecting the total float of the succeeding activities
(c) Identify the activities which can be delayed without affecting the total float of the preceding activities or succeeding activities
(d) Establish priorities

Q109. Critical Path is always

(a) The longest path
(b) The shortest path
(c) The most profitable path
(d) The fastest path

Q110. Economic saving of time results by crashing

(a) Cheapest critical activity
(b) Costliest critical activity
(c) Cheapest non-critical activity
(d) Costliest non-critical activity

Q111. Interfering float is the difference between

(a) Total float and Free float
(b) Total float and Independent float
(c) Independent float and Free float
(d) None of the above

Q112. Grader is used mainly for

(a) Trimming and finishing
(b) Shaping and trimming
(c) Finishing and shaping

(d) finishing, shaping and trimming

Q113. The process of incorporating changes and rescheduling or replanning is called

(a) resource leveling
(b) resource smoothening
(c) updating
(d) critical path scheduling

Q114. A typical sequence of following development phases in a construction project is

(P) Plan development
(Q) Commissioning
(R) Concept analysis
(S) Execution

(a) P-Q-R-S
(b) P-R-S-Q
(c) P-S-R-Q
(d) R-P-S-Q

Q115. The full form of PERT method of project network analysis is:

(a) Project Estimation and Review Technique
(b) Program Evaluation and Review Technique
(c) Project Estimation and Report Technique
(d) Partial Evaluation and Review Techniqe

Q116. Given that the base period is 100 days and the duty of the cannel is 1000 hectares per cumees, the depth of water will be

(a) 0.864 cm
(b) 8.64cm
(c) 86.4 cm
(d) 864 cm

Q117. Acidic soils are reclaimed by

(a) Leaching of the soil
(b) Using limestone as a soil amendment
(c) Using gypsum as a soil amendment
(d) Provision of drainage

Q118. The delta for a crop having base period 120 days is 70 cm. What is the duty?

(a) 2480 hectare/cumec
(b) 1481 hectare/cumec
(c) 14.81 hectare/cumec
(d) 1.481 hectare/cumec

Q119. What is the moisture depth available for evapotranspiration in root of 1 m depth soil, if dry weight of soil is 1.5 gm/cc, field capacity is 30% and permenant wilting point is 10%?

(a) 450 mm
(b) 350 mm
(c) 200 mm
(d) 150 mm

Q120. Which of these does not the zone of aeration in the soil profile?

(a) Saturation zone
(b) Capillary zone
(c) Intermediate zone
(d) Soil water zone

Q121. According to Kennedy, non-silting and non-scouring velocity is called

(a) Area of flow section and top water surface width
(b) Area of flow section and the wetted perimeter
(c) Total cross sectional area and top water surface width
(d) Total cross sectional area and the wetted perimeter

Q122. Lacey's theory is applicable to flow

(a) through pipes
(b) over spillways
(c) in alluvial rivers and canal
(d) in concrete lined canals

Q123. Isohyetal method is used for determination of

(a) evapotranspiration
(b) seepage loss
(c) precipitation
(d) intensity of flood

Q124. Hyetograph is a plot of

(a) Cumulative rainfall v/s time
(b) Rainfall intensity v/s time
(c) Rainfall depth v/s time
(d) Discharge v/s time

Q125. The error which follows the mathematical law of probability is

(a) Mistakes
(b) Compensating Error
(c) Systematic Error
(d) Accidental Error

Q126. Probable maximum flood is

(a) an impossibly large flood discharge
(b) largest flood that could conceivably occur at a particular location
(c) a flood with maximum probability of occurrence.
(d) the maximum possible flood which is probable for that year

Q127. The distance between centre to centre of two adjacent rivet holes should not be less than

(a) 1.5 times the diameter of rivet hole
(b) 1.5 times diameter of rivet
(c) 1.5 times diameter of rivet head
(d) 2.5 times diameter of rivet

Q128. Base flow separation is used in connection with

(a) Seepage flow
(b) Infiltration
(c) Evaporation
(d) Stream flow

Q129. Kor water is the

(a) first watering before a crop is sown
(b) first watering after a crop s sown
(c) first water after a crop is grown
(d) water of least depth

Q130. Permanent wilting point is

(a) a characteristics of a plant
(b) a soil characteristic
(c) a soil characteristics modified by a plant
(d) dependent on soil water plant fertilizer interaction

Q131. The theory of Unit Hydrograph was propounded by

(a) L.K. Sherman
(b) A.N. Khosla
(c) L. Prandtl
(d) C. Inglis

Q132. If Reynold's number is less than 1, then

(a) Viscous forces are very strong as compared to inertial forces
(b) Viscous forces are very weak as compared to inertial forces
(c) Viscous forces are equal to inertial forces
(d) Flow is turbulent is saturated soils

Q133. The cavitation and pitting can be prevented by creating which one of the following conditions?

(a) Reducing the pressure head
(b) Reducing the velocity head
(c) Increasing the elevation head
(d) Reducing the piezometric head

Q134. Maximum pressure rise due to water hammer in a pipeline is (Note: a = area of the pipe, V = Velocity, g = acceleration due to gravity, t = time period, length of the pipe line)

(a) $aV/2g$
(b) $aV^2/2g$
(c) LV/gt
(d) LV^2/gt

Q135.Choose the best option for the Newtonian fluid

(a) Frictionless and incompressible
(b) Viscosity in invariant with shear stress
(c) Viscosity decreases at higher shear stress
(d) Viscosity increases at higher shear stress

Q136. Which one of the following pressure units represent the least pressure

(a) Millibar
(b) Mm of Hg
(c) N/mm^2
(d) Kgf/m^2

Q137. Consider the following parameters related to fluid flow:

(i) Vorticity
(ii) Velocity potential
(iii) Stream Function

Which of these parameters exit both in rotational irrotational flows

(a) i and ii
(b) ii and iii
(c) i and iii
(d) i,ii and iii

Q138. Which of the following pair is incorrectly matched

(a) Piezometric Head: Sum of datum head and pressure head
(b) Dynamic Head: Sum of datum head and velocity head
(c) Stagnation Head: Sum of pressure head and velocity head
(d) Total Head: Sum of piezometric head and dynamic head

Q139. The terminal velocity of a sphere settling in a viscous fluid varies as

(a) the Reynolds number
(b) the square of its diameter
(c) Its diameter
(d) viscosity of the fluid

Q140. Two identical pumps, each capable of delivering 0.2 cumec, against a head of 30m, are connected in parallel. The resulting discharge will be

(a) 0.4 cumec against a head of 30m
(b) 0.4 cumec against a head of 60m
(c) 0.2 cumec against a head of 30m

(d) 0.2 cumec against a head of 60m

Q141.If the velocity of flow as well as the diameter of the flowing pipe are respectively doubled, the head loss thereafter be

(a) Halved
(b) Doubled
(c) Increased 4 times
(d) No change

Q142. Weber number can be best connected to which of the following

(a) Formation of liquid droplet
(b) High speed flow of a gas
(c) Flow in closed conduits
(d) Sloping interface between fluids of different densities

Q143. Euler number is related to

(a) Inertia force and pressure force
(b) Inertia force and elastic force
(c) Inertia force and viscous force
(d) Inertia force and gravity force

Q144. The gases are considered incompressible when Mach number is

(a) equal to 1.0
(b) equal to 0.5
(c) more than 0.3
(d) less than 0.2

Q145. Bernoulli's theorem deals with the law of conservation of

(a) Mass
(b) Momentum
(c) Energy
(d) None of the above

Q146. The flow in open channel is laminar if the Reynold number is

(a) Equal to 2000
(b) Between 500-2000
(c) Less than 500
(d) More than 4000

Q147. The relation between probability (P) and recurrence interval (T) is given by

(a) $PT = 1$
(b) $PT^2 = 1$
(c) $P/T = 1$
(d) $P/T^2 = 1$

Q148. If sufficient moisture is always available to completely meet the needs of vegetation fully covering the area, the resulting evapotranspiration is called

(a) Potential evapotranspiration
(b) Actual evapotranspiration
(c) Consumptive evapotranspiration
(d) Direct evapotranspiration

Q149. Lawn sprinkler can be best explained by which of the following equation of property?

(a) Energy equation
(b) Continuity equation
(c) Moment of momentum principle
(d) Impulse-momentum principle

Q150. Sulphate attack over a building material is caused by salts of

(a) Calcium
(b) Magnesium
(c) Sodium
(d) Potassium

Q151. Porcelain is made by heating materials having

(a) Kaolinite
(b) Montmorillonite
(c) Bentonite
(d) Phyllite

Q152. 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

Q153. 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

Q154. The stone cover laid to protect the face of the guide bank at river bed is called

(a) Launching apron
(b) Blanket
(c) Cut off
(d) Curtain

Q155. If super elevation is not provided on a horizontal curve of a highway, then on which portion of the road are the pot holes likely to develop

(a) Outer edge of the road

(b) Inner edge of the road
(c) Centre of the road
(d) Shoulder of the road

Q156. Nagpur road plan formulae were prepared by assuming

a. Radial or star and block road pattern
b. Radial or star and circular road pattern
c. Radial or star and grid road pattern
d. Rectangular and block road pattern

Q157. Full amount of super elevation on a horizontal curve is provided at the

(a) beginning of the transition curve
(b) centre of the circular curve
(c) end of the transition curve
(d) centre of the transition curve

Q158. With all other relevant conditions remaining the same, the speed of a vehicle negotiating a curve is proportional to

(Note: W = Weight of the vehicle)

(a) $W^{1/2}$
(b) W
(c) 1/W
(d) $1/W^{1/2}$

Q159. An ideal horizontal transition curve is a Labours

(a) Parabola
(b) Circle
(c) Clothoid
(d) Hyperbola

Q160. If R is the radius of the curve and L is the length of the long chord, the shift of the curve is (all in meter units)

(a) L^2/R
(b) $L^2/2R$
(c) $L^2/24R$
(d) $L^2/6R$

Q161. It is a common practice t design a highway to accommodate the traffic volume corresponding to the

(a) 30^{th} hour
(b) Peak hour
(c) Average daily traffic
(d) 15 minute peak period

Q162. Which set of traffic is needed for furnished design as well as for highway capacity design

(a) Origin and Destination studies
(b) Parking and Accident studies
(c) Speed and volume studies
(d) Axle and studies

Q163. Speed and Delay study is conducted by which of the following method instrument.

(a) Floating car method
(b) Workspot interview method
(c) Doppler Radar
(d) Electronic Detector

Q164. Space mean speed is used for which of the following studies

(a) Road conditions studies
(b) Accident studies
(c) Traffic flow studies
(d) Delay studies

Q165. Traffic volume can be defined as

(a) Number of vehicles occupying a unit length of road at a given instant of time
(b) Number of vehicles at the cross roads.
(c) Number of vehicles passing a given point on road in a given unit of time in a given direction
(d) Number of vehicles passing a given point on road in a given unit of time in all the possible directions.

Q166. Consider the following factors:

(i) Reaction time
(ii) Speed
(iii) Coefficient of longitudinal friction
(iv) Gradient

Which of these factors are taken into account for computing braking distance

(a) (i) and (iv)
(b) (i), (ii) and (iv)
(c) (ii), (iii) and (iv)
(d) (ii) and (iii)

Q167. Total reaction time of a driver depend upon:

(i) Perception time
(ii) Brake reaction time
(iii) Speed of vehicle

(a) (i) and (ii)
(b) (i) and (iii)
(c) (ii) and (iii)
(d) (i), (ii) and (iii)

Q168. California bearing ratio is a

(a) Measure of soil strength
(b) Method of soil identification

(c) Measure to indicate the relative strengths of paving materials
(d) Measure of shear strength under lateral confinement

Q169. The essential difference between rigid and flexible pavements is

(a) Distribution of load over sub-grade
(b) Distribution of load over sub-base
(c) Materials used
(d) Thickness of layers

Q170. Rigid pavement are commonly made of

(a) Bitumen
(b) Portland cement concrete
(c) Dry lean concrete
(d) High performance concrete

Q171. Which of the following pavement can be used, for construction on black cotton soils?

(a) Flexible pavement
(b) Semi-flexible pavement
(c) Rigid pavement
(d) Semi-Rigid pavement

Q172. Which of the following layer of pavement should withstand high level of deformation?25

(a) Base course
(b) Sub-base
(c) Sub-grade
(d) Surfacing course

Q173. IRC 37-2001 revised version for flexible pavement design has been designed as

1.0

(a) 4-layer
(b) 3-layer
(c) 2-layer
(d) 5-layer

Q174. Which one of the following expressions gives the Intermediate Sight Distance as per IRC standards

(a) 2 SSD
(b) (SSD + OSD)/2
(c) (OSD - SSD)/2
(d) 2 OSD

Q175. Which of the following pairs is NOT correctly matched

(a) Horizontal curves – Super elevation
(b) Origin and Destination studies – Desire Lines
(c) Los Angeles Test – Hardness of aggregates
(d) Soundness test – Purity of bitumen

Q176. To prevent local crushing of the web due to concentrated loading, which type of stiffeners are provided?

(a) Torsion stiffeners
(b) Diagonal stiffeners
(c) Load carrying stiffeners
(d) Bearing Stiffeners

Q177. The main undesirable properties of concrete are:

(i) Undergoes shrinkage
(ii) Requires careful attention during manufacturing, placing and curing
(iii) Has lower tensile strength
(iv) For equal load, cement members are heavier than steel members

(a) i and iv only
(b) i, ii and iv only
(c) i, ii, iii and iv
(d) ii, iii and iv

Q178. Test carried out to determine tensile strength of concrete is called

(a) split test or Brazillian test
(b) Vee-Bee test
(c) triaxial loading test
(d) compression test

Q179. In plastic analysis of structures, the segment between any two successive plastic hinges is assumed to deform as _____

(a) A plastic material
(b) A rigid material
(c) An elastic material
(d) An inelastic material

Q180. The ratio of axial deformation to the original length of the body is known as

(a) Lateral Strain
(b) Linear stress
(c) Linear Strain
(d) Poisson's ratio

Q181. The main advantage of adding pozzolanas in cement is

(a) longer life
(b) reduced cost and permeability of concrete
(c) slower setting time
(d) faster setting time

Q182. The most undesirable properties of water used for making concrete or mortar are:

(a) high concentration of carbonates
(b) high concentration of bicarbonates

(c) high concentration of sulfate and chloride
(d) high concentration of silicates

Q183. A tube well having a capacity of 4 m^3 per hour operates for 20 hours each day during the irrigation season. How much area can be commanded if the irrigation interval is 20 days and depth of irrigation is 7 cm.

(a) 1.71×10^4 m^2
(b) 1.14×10^4 m^2
(c) 22.9×10^4 m^2
(d) 2.29×10^4 m^2

Q184. IRC standard loading for bridge designs are

(a) Class A, Class B, Class AB and Class 70-R
(b) Class A, Class B, Class AB and Class 90-R
(c) Class A, Class B, Class BB and Class 70-R
(d) Class A, Class B, Class AA and Class 70-R

Q185. Floats are used to be measure

(a) Discharge of stream
(b) Velocity of stream
(c) Flood discharge
(d) Afflux

Q186. Bessemer process is used for

(a) Steel
(b) cast iron
(c) Wrought iron
(d) Pig iron

Q187. Keeping the instrument height as 1.5m, height of staff 4 m, the slope of ground as 1 in 10, the sight distance on the down-slope must be less than

(a) 25m
(b) 30m
(c) 15m
(d) 20m

Q188. A catchment consists of 35% area with runoff coefficient 0.45 with the remaining 65% area with runoff coefficient 0.55. The equivalent runoff coefficient will be

(a) 0.505
(b) 0.515
(c) 0.500
(d) 0.450

Q189. A linear reservoir is one in which

(a) Storage varies linearly with time
(b) Storage varies linearly with outflow rate
(c) Storage varies linearly with inflow rate
(d) Storage varies linearly with elevation

Q190. In the fourth amendment May 2013 of IS 456-2000, M60 grade has been shifted to

(a) standard concrete from high strength concrete
(b) high strength concrete from high strength standard concrete
(c) standard concrete from an ordinary concrete
(d) ordinary concrete from a standard concrete

Q191. Arrange the following sections in increasing torsional stiffness:

1) Open ring section
2) Close ring section
3) L-section
4) Circular disk section

(a) 1, 2, 3, 4
(b) 3, 1, 2, 4
(c) 3, 2, 1, 4
(d) 4, 3, 1, 2

Q192. The split tensile strength of M15 grade concrete when expressed as a percentage of its compressive strength is

(a) 10 to 15%
(b) 15 to 20%
(c) 20 to 25%
(d) 25 to 30%

Q193. Shrinkage of concrete depends upon the

1) relative humidity of the atmosphere
2) passage of time
3) applied stress

Which of these statements is/are correct?

(a) 1 and 2
(b) 2 and 3
(c) 1 alone
(d) 1, 2 and 3

Q194. The ratio of the rate of change of discharge of an outlet and parent channel is known as

(a) Flexibility
(b) Rigidity
(c) Efficiency
(d) Modular limit

Q195. Live load as forces in dwelling home hospital bedrooms dormitories is

(a) 2 kN/m^2
(b) 3 kN/m^2
(c) 4 kN/m^2
(d) 5 kN/m^2

Q196. The unit of coefficient of consolidation is

(a) cm/sec
(b) cm^2/sec
(c) cm/sec^2
(d) No unit

Q197. The apparatus used for measuring soundness of cement is

(a) Vicat's apparatus
(b) Le Chatelier's apparatus
(c) Briquette apparatus
(d) Lechate apparatus

Q198. The ratio of ultimate stress to the permissible stress is called…..

(a) Factor of safety
(b) Design factor
(c) Stress factor
(d) Load factor

Q199. In simply supported beam of rectangular cross section, the bending stress is _____ and shear stress is _____ at neutral axis.

(a) Zero, Maximum
(b) Maximum, Zero
(c) Zero, Zero
(d) Maximum, Maximum

Q200. In case of industrial steel structure, sag roads are designed as _____

(a) Torsional member
(b) Compression member
(c) Bending member
(d) Tension member

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