1. The law of water cement ratio was first proposed by
   (1) Duff Abraham
   (2) Brown
   (3) Ferret
   (4) Vicat

2. The compound that helps in obtaining early strength of cement concrete is
   (1) C_3S
   (2) C_2S
   (3) C_3A
   (4) C_4AF

3. Slump test is a measure of
   (1) Tensile Strength
   (2) Compressive Strength
   (3) Flexural Strength
   (4) Workability

4. Hydration of cement is relation between
   (1) Sand and water
   (2) Steel and water
   (3) Clay and water
   (4) Cement and water

5. Bleeding of concrete is
   (1) Separation of coarse aggregates from the mix
   (2) Separation of fine aggregates from the mix
   (3) Separation of cement and water from the mix
   (4) All the above

6. Maturity is
   (1) Σ (time $\times$ temperature)
   (2) Σ (time $\times$ curing age)
   (3) Σ (time $\times$ strength)
   (4) Σ (time $\times$ gel space ratio)

7. Purpose of accelerated curing is
   (1) To know the strength at the earlier
   (2) To get the higher strength at earlier
   (3) To know the strength
   (4) None of the above

8. H/D ratio for compressive strength test specimen is
   (1) 1.5
   (2) 2.0
   (3) 2.5
   (4) 3.0

9. Compressive strength of OPC 43 Grade Cement at the end of 28 days curing is
   (1) 4.3 N/mm^2
   (2) 43 N/mm^2
   (3) 53 N/mm^2
   (4) 5.3 N/mm^2

10. Creep in concrete increases with
   (1) Increase in cement content
   (2) Decrease in curing time
   (3) Decrease in age of concrete at the time of loading
   (4) All the above

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11. pH value of water for quality concrete shall not be less than

(1) 2

(2) 4

(3) 6

(4) 12

12. A combined sewerage system, collectively carries

(1) Domestic sewage and industrial sewage

(2) Storm sewage and domestic sewage

(3) Storm sewage and industrial sewage

(4) Storm drainage and sewage

13. The value of the coefficient (K) of run-off for watertight roof surface, tend to

(1) 0.01 – 0.20

(2) 0.15 – 0.30

(3) 0.70 – 0.95

(4) Infinity

14. The most widely adopted sewer pipes is

(1) Rectangular

(2) Circular

(3) Egg-shape

(4) Parabolic

15. The best pipe material to resist erosion, abrasion, is

(1) R.C.C.

(2) Brick masonry

(3) Glazed stoneware

(4) Asbestos cement

16. Minimum Dissolved Oxygen prescribed for a river stream, to avoid fish kills, is

(1) 2 ppm

(2) 4 ppm

(3) 8 ppm

(4) 10 ppm

17. While testing for Chemical Oxygen Demand (COD) of sewage, organic matter is oxidized by $K_2 Cr_2 O_7$ in the presence of

(1) HCl

(2) H_2SO_4

(3) HNO_3

(4) None of these

18. Which industry causes thermal pollution ?

(1) Cement

(2) Food Preservation

(3) Nuclear Power Plant

(4) None of these

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19. The detention period adopted for oxidation ponds is of the order of

(1) 2-6 weeks

(2) 2-4 days

(3) 1-2 weeks

(4) 4-8 days

20. The sewage treatment units, which work on anaerobic decomposition of organic matter, are

(1) Oxidation ponds

(2) Septic tanks

(3) Activated sludge plants

(4) Both (2) and (3)

21. The anaerobic method of mechanical compositing, as practiced in India, is called

(1) Indore method

(2) Mangalore method

(3) Bangalore method

(4) None of these

22. Leachate is a liquid, that flows out from the bottom of

(1) Septic tanks

(2) Landfills

(3) Compost plants

(4) Aerated lagoons

23. The drinking water source should not contain coliform MPN more than

(1) 10/100

(2) 20/100

(3) 30/100

(4) 50/100

24. Pollution control equipment electrostatic precipitators reduces

(1) Sulphur dioxide

(2) Particulate emission

(3) Both (1) and (2)

(4) None of these

25. The device, which can be used to control gaseous as well as particulate pollutants, in the industrial emissions, is known as

(1) Cyclone

(2) Spray tower

(3) Chimney

(4) Bag filter

26. Minamata disease caused in Japan due to poisoning of

(1) Lead

(2) Methyl mercury

(3) Cadmium

(4) Nickel

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27. Width of carriageway recommended by the IRC for two lanes, with rained Kerbs

(1) 7.0 mtr

(2) 7.5 mtr

(3) 5.5 mtr

(4) 6.5 mtr

28. What is the safe stopping sight distance for a design speed of 50 kmph for two way traffic on a two lane road ? Assuming Co-efficient of friction as 0.37 and Reaction time as 2.5 secs.

(1) 50.12 m

(2) 65.16 m

(3) 61.40 m

(4) 68.35 m

29. Find out the expression for sleeper density for a B.G. track if 19 sleepers are used under a rail length x = ?

(1) 5

(2) 7

(3) 8

(4) 6

30. Find out the airport reference temperature if mean of the maximum daily temperature = 43.72 °C and mean of the average daily temperature = 26.32 °C.

(1) 32.12 °C

(2) 31.25 °C

(3) 30.16 °C

(4) 32.86 °C

31. If the direction of wind is at an angle to the runway centre line, its component along the direction of runway will be

(1) V sec θ

(2) V sin θ

(3) V tan θ

(4) V cos θ

32. An estimate of theoretical maximum **or** basic capacity of a single lane may be made from the relation

(1) 1000 V/S

(2) 1500 V/S

(3) 1200 V/S

(4) 1400 V/S

33. High mart lighting height varies from

(1) 15 m to 40 m

(2) 20 m to 35 m

(3) 20 m to 45 m

(4) 15 m to 45 m

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34. The important component of a sea port is

(1) Terminal Buildings

(2) The Docks

(3) The Harbour

(4) All of these

35. A road-stead

(1) is a protected area of water where boats can move safely.

(2) is the end of the road at the harbour.

(3) may be protected by breakwater walls.

(4) None of these

36. High amount of energy consuming building material is

(1) Aluminium

(2) Steel

(3) Cement

(4) Burnt brick

37. Requirement of roof and wall in composite climate is

(1) Walls and roofs must be constructed of heavy material with large thermal capacity.

(2) It is advisable to construct buildings of low thermal capacity materials using light weight construction.

(3) It is advisable to construct high thermal capacity structures to have 8 hours time lag.

(4) Roofs and walls should therefore be constructed of solid masonry or concrete to have 9 to 12 hours time lag.

38. For planning a new town, noise level range to classify zones of concentrated average noise source is

(1) less than 60 dBS

(2) 60-70 dBS

(3) 80 to 90 dBS

(4) 70-80 dBS

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39. Recommended play field required for secondary/higher secondary school is

(1) 10,000 m^2

(2) 15,000 m^2

(3) 20,000 m^2

(4) 25,000 m^2

40. To obtain average indoor wind velocity around 30% of outdoor velocity, desirable total area of opening (inlet and outlet) required is

(1) 30 to 40% of floor area

(2) 20 to 30% of floor area

(3) 40 to 50% of floor area

(4) Greater than 50% of floor area

41. The following compound is added at the time of grinding of cement clinkers for the purpose of delaying the setting time :

(1) Calcium chloride

(2) Gypsum

(3) Lime

(4) Silica

42. This is not the grade of ordinary Portland cement as per Indian standards

(1) 23 grade

(2) 33 grade

(3) 43 grade

(4) 53 grade

43. The aggregates passing 4.75 mm sieve and retaining on 75 micron sieve are called

(1) Coarse aggregates

(2) Fine aggregates

(3) Well graded aggregates

(4) Uniformly graded aggregates

44. The preventive ASCU treatment for timber is given so as to prevent

(1) Catching of fire

(2) Water percolation

(3) Attack of white ants

(4) Sound penetration

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45. The ratio of lateral strain to longitudinal strain is

(1) Void ratio

(2) Poisson's ratio

(3) Slenderness ratio

(4) Modular ratio

46. The relationship between shear force and bending moment is given by

(1) M/I= f/y

(2) M/2

(3) $\int M\,dx$

(4) $F = dM/dx$

47. The relationship between elastic modulus (E) and bulk modulus (K) is given by

(1) $E = 3K(1 - 2\mu)$

(2) $E = 2K(1 + \mu)$

(3) $E = 2K(1 - \mu)$

(4) $E = 3K(1 + 2\mu)$

48. The point where the bending moment changes its sign is called, the point of

(1) Superposition

(2) Contraflexure

(3) Symmetry

(4) Neutral Axis

49. The ratio of polar moment of inertia of the shaft section and its maximum radius is called

(1) Section Modulus

(2) Polar Modulus

(3) Young Modulus

(4) Bulk Modulus

50. The most commonly used damp proofing material is

(1) Bitumen

(2) Cement concrete

(3) Paraffin wax

(4) Cement solution

51. A closing error in a traverse is adjusted by

(1) Elimination of error

(2) Modifying the shape

(3) By distributing the error to all stations proportionally

(4) None of the above

52. A well conditioned triangle has angles not less than and more than respectively

(1) 10° and 90°

(2) 20° and 120°

(3) 90° and 120°

(4) None of the above

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53. The whole circle bearing 338°42' converted to quadrantal bearing will be

(1) S 21° 18' E

(2) S 21° 18' W

(3) N 21° 18' E

(4) N 21° 18' W

54. Isobar is a line which joins the points of equal

(1) Rainfall depth

(2) Humidity

(3) Temperature

(4) Atmospheric pressure

55. A geological formation which may contain water but is essentially impermeable to the flow of water through it is known as

(1) Aquifer

(2) Aquifuge

(3) Aquitard

(4) Aquiclude

56. A laboratory test on a sample from an aquifer revealed a porosity of 35%. The specific yield of the aquifer will be

(1) Equal to 0.35

(2) Less than 0.35

(3) More than 0.35

(4) Difficult to predict

57. The observed annual run-off from a basin of area 500 km^2 is 150 mm^3 and the corresponding annual rainfall over the basin during the same year is 750 mm. What is the run-off coefficient ?

(1) 0.2

(2) 0.67

(3) 0.4

(4) 0.5

58. The Δ (in m) for a crop, having quantity duty D (in ha / cum.) and base period B (in days) is given by

(1) $\Delta = \frac{8.64\ B}{D}$

(2) $\Delta = \frac{864\ B}{D}$

(3) $\Delta = \frac{100}{D}$

(4) $\Delta = \frac{10{,}000}{D}$

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59. Match the following :

A.	Side slope canal	1.	Saves the cost of construction of cross drainage work.
B.	Contour canal	2.	Where canal is taken over drain.
C.	Ridge canal	3.	Aligned at right angles to the contour.
D.	Alluvial canal	4.	Irrigates only on one side.
		5.	Canal excavated in alluvial soil.

	A	B	C	D
(1)	3	4	1	5
(2)	3	1	2	5
(3)	2	4	5	3
(4)	5	1	2	4

60. Trap efficiency of a storage reservoir is defined as

(1) $\frac{\text{Total annual sediment inflow}}{\text{Reservoir capacity}}$

(2) $\frac{\text{Total sediment deposited in a given period}}{\text{Total sediment inflow in that period}}$

(3) $\frac{\text{Total annual sediment deposited in the reservoir}}{\text{Dead storage capacity of the reservoir}}$

(4) None of the above

61. Match the following :

A.	Bhakra Dam	1.	is a type of arch dam.
B.	Idduki Dam	2.	is a small dam to raise water level.
C.	Diversion Dam	3.	is a dam where side flanks are of earthen.
D.	Nagarjunsagar Dam	4.	is a timber dam.
		5.	is a gravity dam.

	A	B	C	D
(1)	2	1	5	3
(2)	5	1	2	3
(3)	3	4	5	2
(4)	4	5	2	3

62. In a pipeline the hydraulic grade-line is above the pipe centre line in the longitudinal section at point A. and below the pipe centre line at another point B. From this it can be inferred that

(1) Vacuum pressure prevails at B.

(2) Vacuum pressure prevails at A.

(3) The flow is from A to B.

(4) The flow is from B to A.

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63. A hydraulically most efficient Trapezoidal channel section carries water at the optimum depth of 0.72 m. Chezy's coefficient is 75 and the longitudinal slope is 1 in 2500. What is the discharge through the channel ?

(1) 0.808 m^3/sec.

(2) 1.14 m^3/sec.

(3) 0.900 m^3/sec.

(4) 0.090 m^3/sec.

64. In a 90° triangular notch, for a given head, the error in the estimated discharge due to a 2% error in the measurement of the vertex angle is

(1) π%

(2) 5.0%

(3) 3.0%

(4) $\frac{\pi}{2}$%

65. A turbine develops 2515 kw at 240 rpm. The torque in the shaft is

(1) 400 kN-m

(2) 3335 kN-m

(3) 1000 kN-m

(4) 100 kN-m

66. If the dynamic viscosity of a fluid is 0.5 poise and specific gravity is 0.5, then the kinematic viscosity of that fluid in stokes is

(1) 0.25

(2) 0.50

(3) 1.0

(4) None of the above

67. Choose the correct relationship.

(1) Specific Gravity = Gravity × Density

(2) Gravity = Specific Gravity × Density

(3) Dynamic Viscosity = Kinematic Viscosity × Density

(4) Kinematic Viscosity = Dynamic Viscosity × Density

68. Flow at constant rate through a tapering pipe is

(a) steady flow

(b) uniform flow

(c) unsteady flow

(d) non-uniform flow

The correct answer is :

(1) (a) & (b)

(2) (a) & (d)

(3) (b) & (c)

(4) (b) & (d)

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

(1) Effective rainfall

(2) Consumptive use

(3) Consumptive irrigation requirement

(4) Net irrigation requirement

70. A river turning work is generally required when the river is

(1) all when river was full

(2) meandering

(3) aggrading

(4) degrading

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71. In a reaction turbine, draft tube is used

(1) To transport water downstream without eddies

(2) To convert kinetic energy to flow energy by a gradual expansion

(3) For safety of turbine

(4) To increase flow rate

72. The Gauge width of Narrow Gauge railway track is

(1) 0.610 m

(2) 0.762 m

(3) 1.676 m

(4) 1.762 m

73. The height of a polycentric tunnel for a double railway track ranges from

(1) 8.8 m to 9.1 m

(2) 8.8 m to 9.2 m

(3) 8.8 m to 9.3 m

(4) 8.8 m to 9.4 m

74. The clear spacing between the roof of tunnel and top of locomotive in a single track tunnel is atleast

(1) 50 cm

(2) 75 cm

(3) 90 cm

(4) 100 cm

75. The annual periodic payments made for the repayment of the capital invested is known as

(1) annuity

(2) depreciation

(3) sinking fund

(4) solatium

76. In the centre line method of working out volumes, for cross walls, what deductions must be made from the centre line length at each junction ?

(1) Twice the breadth

(2) Breadth

(3) 1.5 breadth

(4) Half the breadth

77. The loss of value of property by its becoming out of date in style, in design, in structure etc., is called

(1) obsolescence

(2) distress value

(3) salvage value

(4) scrap value

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78. Which of the following does not represent an activity ?

(1) Site located

(2) Foundation is being dug

(3) The office area is being cleaned

(4) The invitations are being sent

79. Critical path

(1) is always longest

(2) always shortest

(3) may be longest

(4) may be shortest

80. Slack is

(1) difference of latest allowable time and earliest expected time

(2) least allowable time-earliest expected time

(3) earliest expected time-latest allowable time

(4) time gained by an activity

81. PERT is

(1) activity oriented → CPM

(2) event oriented

(3) time oriented

(4) resources oriented

82. The loss of strength upon disturbance in clayey soils & subsequent regaining of portion of strength due to remolding with respect to time are respectively known as

(1) Activity & Sensitivity

(2) Sensitivity & Thixotropy

(3) Thixotropy & Sensitivity

(4) Activity & Resistivity

83. The base units of tetrahedral silica & octahedral unit of alumina is known as

(1) Gibbsite

(2) Bauxite

(3) Zeolite

(4) None of the above

84. Which of the following expression represents Quick sand condition in soil ?

(1) G–1/1+e

(2) G+1/1+e

(3) 1+e/G+1

(4) G–1/1–e

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85. In falling head permeameter test on a soil sample for equal time intervals are noted for drop of head from h_1 to h_2 and again from h_2 to h_3. Which of the following relationship is shall hold good ?

(1) $h_2^2 = h_1 h_3$

(2) $h_1^2 = h_2 h_3$

(3) $h_3^2 = h_1 h_2$

(4) $(h_1 - h_2) = (h_2 - h_3)$

86. A partially saturated soil sample has a natural water content of 14% & a bulk unit weight of 19 kN/m^3 with specific gravity of solids as 2.70 & r_w = 9.8 kN/m^3, the degree of saturation is

(1) 75%

(2) 64%

(3) 55%

(4) 100%

87. What is the intensity of vertical pressure at a point 3 metre directly below a 25 kN point load acting on a horizontal ground surface ?

(1) 1.326 kN/m^2

(2) 2.05 kN/m^2

(3) 0.528 kN/m^2

(4) 0.663 kN/m^2

88. The soil structures that are arranged in face-to-face orientation are called

(1) Dispersed

(2) Flocculent

(3) Honeycomb

(4) Cohesive Matrix

89. Plate load test is useful in estimating

(1) Bearing capacity of soil

(2) Settlement of the foundation

(3) Depth of foundation

(4) Both (1) and (2)

90. The correct increasing order of soil particles size is

(1) Clay, silt, sand, gravel

(2) Silt, clay, sand, gravel

(3) Gravel, silt, sand, clay

(4) Clay, sand, silt, gravel

91. Capillary water in soils

(1) Causes negative water pressure

(2) Reduces effective pressure

(3) Reduces bearing capacity

(4) None of the above

92. Which of the following statement is correct ?

(1) Active earth pressure is greater than passive earth pressure.

(2) Passive earth pressure is greater than active earth pressure.

(3) Active and passive earth pressures are equal.

(4) Earth pressure at rest is greater than passive earth pressure.

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93. The relationship between shear strength and corresponding normal stress for C-ϕ soils is given by

(1) $\tau = \sigma \tan \phi$

(2) $\tau = C + \sigma \tan \phi$

(3) $\tau = C$

(4) $\tau = q_u / 2$

94. Specific surface expressed as surface area of the particle per unit volume of the soil particle is

(1) $6/D$

(2) $6/D^2$

(3) $1/6\ \pi D^2$

(4) $D/6$

95. The zone in a loaded soil mass bounded by an isobar of given vertical pressure intensity is called

(1) Newmark's Chart

(2) Pressure Bulb

(3) Slip Circle

(4) Influence Line

96. Relative density of sand sample having maximum dry density r_{dmax} = 20 kN/m^3, r_{dmin} = 12 kN/m^3, in-situ dry density r_d = 16 kN/m^3 will be

(1) 75%

(2) 62.5%

(3) 67.5%

(4) 50%

97. Which of the following statement is correct ?

(1) A recovery ratio of less than 1 implies, the soil is compressed.

(2) A recovery ratio less than 1 implies, that the soil has swelled.

(3) A recovery ratio of greater than 1 implies, the soil is compressed.

(4) All of the above

98. The plane of shear failure is predetermined in the case of following shear test :

(1) Direct shear test

(2) Vane shear test

(3) Tri-axial shear test

(4) Unconfined compression test

99. Vane shear test is normally used for the determination in-situ shear strength of

(1) soft clays

(2) sand

(3) stiff clays

(4) gravel

100. Segregation is responsible for

(1) Honeycombing in concrete

(2) Porous concrete

(3) Sand deficient concrete

(4) All the above

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