Name of Post : **Assistant Engineer** Question Paper Code : **210/2008**
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1. The discharge through a rectangular notch is given by

A. $Q= 2/3\ Cd\ Ch^{5/2}$ B. $Q= 2/3Cd\ L\ H^{3/2}$
C. $Q=8/15\ Cd\ LH^{5/2}$ D. $Q= 8/15Cd\ LH^{3/2}$

2. Cipolletti weir is a trapezoidal weir having side slope of

A. 4 horizontal to vertical
B. 1 horizontal to 2 vertical
C. 1 horizontal to 4 vertical
D. 1 horizontal to 3 vertical

3. Chezy's formula is given as Where V = Velocity; S =Longitudinal slope; R = Hydraulic mean radius and c = Chezy's coefficient

A. $V = C\sqrt{SR}$ B. $V = C\sqrt{RS}$
C. $V = C\sqrt{RS}$ D. None of these

4. The depth of flow at which specific energy is minimum is called

A. Normal depth B. Critical depth
C. Alternate depth D. None of these

5. The discharge through a trapezoidal channel is maximum when

A. Half of top width = slopping side
B. Top width = half of sloping side
C. Top width = 1.5 x sloping side
D. None of the above

6. A line joining places of equal rainfall is called

A. Hyetograph B. Isobar
C. Isotherm D. Isohyet

7. For the irrigation of crops the base period B, duty d and ? are related to as :

A. $D= 0.8864B/\Delta$ B. $\Delta= 8.64/DB$
C. $\Delta= 8.64/B$ D. $\Delta= 8.64\ B/D$

8. Humidity is measured by

A. Hydrometer B. Hygrometer
C. Hyetometer D. Anemometer

9. The discharge per unit draw down at a well is known as

A. Specific retention B. Specific capacity
C. Specific yield D. Specific storage

10. Which one of the following does not contribute water logging ?

A. Inadequate drainage
B. Seepage from unlined canals
C. Frequent flooding
D. Excessive tapping of ground water

11. A low gravity dam is the one whose height is less than or equal to

A. $F/ W(S+1)$ B. $F/ W(S+C)$
C. $F/ W\sqrt{S+1}$ D. None of these

12. A channel designed by lacey's theory has a mean velocity of 1 m/ s, the silt factor is unity. The hydraulic mean radius will be

A. 2 m B. 1m
C. 2.5 m D. 0.50 m

13. The spacing of tile drains to relive logged land is directly

A. Depth of drains below the ground surface
B. Coefficient of permeability of the soil to be drained
C. Depth of impervious from the drain
D. Depth of drain below the water level

14. A- 4 hour unit hydrograph of a certain basin has peak ordinate of 80 m^3/s the peak ordinate of a 2 hour unit hydrograph for the same basin will be

A. Equal to 80 m^3/s
B. Less than 80 m^3/s
C. Greater than 80 m^3/s
D. Between 40 m^3/s to 80 m^3/s

15. Garret's diagram for the design of irrigation channel is based on

A. Kennedy's theory and kutters formula
B. Kennedy's theory and manning formula
C. Lacey's theory and kutters formula
D. Lacey's theory and manning formula

16. The acceptable range of ph for potable water is

A. 7 - 8.5 B. 8 -10
C. 2 - 5 D. Above 10

17. MPN is

A. Most permissible number

B. Most probable number

C. Most possible number

D. None of the above

18. Uniformity coefficient of filler sand is given by

A. D50 / D5 B. D50/ D10

C. D60 /D10 D. D10 / D60

19. Self-cleaning velocity is

A. The minimum velocity of flow required to maintain a certain amount of solids in flow

B. The maximum velocity of flow required to maintain a certain amount of solids in flow

C. Such a velocity as would be sufficient to flush out any deposited solids in sewer

D. Such a flow velocity as would be sufficient to ensure that sewage does not remain in the sewer

20. Which of the following would help prevent escape of foul sewer gases from water closet ?

A. Air gap B. Vent pipe

C. Gully trap D. P trap

21. The function of algae in oxidation pond is

A. Provide mat or the surface of the oxidation pond so a s to prevent evaporation of water.

B. Provide oxygen for bacteria to garage organic matter

C. Provide greenish appearance to pond

D. Prevent odour nuisance

22. Which of the following pair is not correctly matched

A. COD – Bio degradability of waste water

B. BOD – strength of waste

C. Methane- product of anaerobic decomposition

D. None of these

23. If the total hardness and alkalinity of a sample of water are 300 mg / I and 100 mg /1 (on CaCO3 sclae) respectively, then its carbonate and non caronite ardness is unit of (mg /1) will be respectively

A. 400 and 300 B. 100 and 400

C. 100 and 200 D. 400 and 200

24. Which of the following forms of chorine has no disinfecting property?

A. Hypo chorus acid B. Hypo chlorite ion

C. Trichloramine D. Monochloramine

25. The two main gases liberated from an anaerobic sludge digestion tank would include

A. Carbon dioxide and methane

B. Ammonia and carbon dioxide

C. Ammonia and methene

D. Ammonia and hydrogen sulphide

26. A uniformly tapered bar of length L, shorter and larger diameter of 'd' 'D' respectively is under an axial pull of P. The elongation is

A. $2PL / \pi^2 E D d$ B. $4 PL / \pi E D d$

C. $3PL/ \pi D^2 E$ D. $4(P)^2 L / \pi E D d$

27. In an elastic body longitudinal strain X, Y Z direction are ex, ey and ez the volumetric strain of the body is given by

A. ex+ey+ez B. 2(ex + ey+ez)

C. ex + ey- ez D. -(ex+ ey+ ez)

28. If Young modules and bulk modules of a material are same, the Poisson's ratio is

A. 1/4 B. 3/4

C. 2/3 D. 1/3

29. The stress included in a member due to suddenly applied load is …. The stress for gradual loading

A. Half B. Same

C. Twice D. Thrice

30. If E1 is the energy stored in a bar under a load 2W and E2 is the energy stored in the same bar under a load W then the ratio E1/E2 is given by

A. 1:1 B. 2 : 4

C. 4:1 D. 2:3

31. When a member is rigidly fixed at the ends and its temperature falls , it is under ….. stress

A. Tensile B. Shear

C. Compressive D. None of these

32. In a cantilever of length 'I' carrying a gradually varying load, zero at the free end to W per unit at the fixed end, the maximum bending moment is

A. $Wl^{2/8}$ B. $Wl^{2/2}$

C. $Wl^{2/4}$ D. $Wl^{2/6}$

33. The slope of the bending moment diagram of any section of a loaded beam is

A. Maximum shear force
B. Maximum bending moment
C. Shear force at the section
D. None of the above

34. The deflection of a beam depends upon

A. Cross section B. Bending moment
C.Young modulus D. All these

35. A column with one end fixed and other end is free capable to carry safety a load 'P' the same column when both ends hinges can safely carry the maximum load of

A. 2 P B. 4 P
C. 6 P D. 8 P

36. A fixed beam of length 'L' carries a central point load W, …… the fixing moments at the ends are

A. WL/4 B. WL/6
C. WL /8 D. WL/10

37. The deflection of a fixed beam carrying a central point load is …… the deflection of the same beam when it is simply supported

A. Less than
C. Equal to
B. Greater than
D. Greater than or equal to

38. Clapeyron's three moment theorem is used to solve

A. Fixed beam
B. Continuous beam
C. Simply supported beam
D. Cantilever

39. A beam simply supported at ends is subjected to moment M at one end the moment induced at the other ends

A. M B. M/2
C. 2M D. Zero

40. The ratio of moment produced at a joint to the moment applied at the other joint is called

A. Distribution factor
B. Carry over factor
C. Stiffness factor
D. Bending moment

41. Moment required at one end of a member to produce unit angle of rotation at that end is called

A. Distribution factor
B. Carry over factor
C. Stiffness factor
D. Bending moment

42. The deflection at any section of a beam is …… of the corresponding section of the conjugate beam

A. Shear force B. Bending moment
C. Deflection D. Slope

43. A tree hinged arch of span 'l' caries a UDL of w/ unit run over the whole span, the horizontal thrust at each support is given by:

A. $Wl^2/8h$ B. $Wh^2/8l$
C. Wl/8h D. Wh/8hl

44. A perfect truss satisfies the equation …. Where 'n' is the number of members 'j' is number of joints

A. j = 2n - 3 B. j = 2n + 3
C. n = 2j + 3 D. n = 2j - 3

45. A two hinged semicircular arch with uniform flexural rigidity and radius R carries a concentrated load W at the crown , the horizontal thrust is given by

A. π / W B. 2W/ π
C. W/2 π D. W/ π

46. Least count of a leveling staff is

A. 0.5 m B. 0.05 m
C. 0.005 m D. 0.10 m

47. In a theodolite if the vertical circle vernier do not read zero when the line of sight is horizontal. The vertical angle measured will be incorrect. this error is known as

A. Residual error B. Angular error
C. Index error D. None of these

48. If the number of sides of a traverse are 'N' then the sum of measured exterior angle should be equal to

A. (2N - 4) right angle
B. (2N + 4) right angle
C. (2N - 2) right angle
D. (2N + 2) right angle

49. Vertical distance between any two consecutive contour is called

A. Horizontal equivalent
B. Contour gradient
C. Contour interval
D. Vertical equivalent

50. Ceylon ghat tracer is used

A. For setting out gradient
B. For measuring areas
C. For setting out curves
D. For measuring area of plan

51: An instrument used for reproducing, enlarging or reducing maps

A. Plan meter B. Clinometer
C. Sextant D. Pantograph

52. A line which passes through the optical center of the objective and the intersection of cross hairs

A. Parallax
B. Line of collimation
C. Height of collimation
D. None of these

53. The least count of transit theodolite is

A. 10" B. 15"
C. 20" D. 25"

54. In a stadia tachometric surveying additive constant is

A. 100 B. 0
C. 50 D. 10

55. Chain used for survey work in the recent times is

A. Gunter's chain B. Engineers chain
C. Metric chain D. Revenue chain

56. During the manufacturing process of Portland, Gypsum or Plaster of Paris is added

A. To increase the strength of cement
B. To modify the colour of cement
C. To adjust the setting time of cement
D. To reduce heat of hydration

57. Finer the cement

A. Higher the rate of hydration
B. More is the surface area
C. Lesser the amount of water required for Constant slump
D. All the above

58. In vicat's apparatus, the cement paste is said to be normal consistent if the penetrates from the bottom by.....

A. 3 mm B. 5 to 10 mm
C. 23 to 25 mm D. 33 to 35 mm

59. Anallactic lens is a

A. Convex lens B. Concave lens
C. Plain glass D. Concavo-convex lens

60. Bleeding of concrete is said to occur when

A. Cement paste raises to the surface of concrete
B. Finer particles settle down at bottom
C. Coarser particles get separated
D. Finer particle collects in isolated pockets

61. The inert ingredients (s)of a concrete mix is/ are

A. Cement B. Aggregate
C. Water D. Entire mix

62. Major 28th day strength giving compound of concrete is

A. Calcium aluminate
B. Di calcium aluminate
C. Tetra calcium alumina ferrite
D. Tricalcium silicate

63. The grade of concrete corresponding to nominal mix proportions of 1:3:6

A. M 35 B. M 25
C. M 15 D. M 10

64. The modulus of elasticity of concrete improves with

A. High water cement ratio
B. Age
C. Shorter curing periods
D. Better compaction

65. The cubes for testing cement in compression are kept at

A. 17 ± 2°C and 100 percent humidity
B. 27 ± 2°C and 65 percent humidity
C. 37 ± 2°C and 80 percent humidity
D. 100°C and 70 percent humidity

66. The unit weight of RCC is

A. 3000 kg /m^3 B. 2500 kg /m^3

C. 2000 kg /m^3 D. 3500 kg /m^3

67. In an over reinforced the neutral axis lines

A. Above the critical N A

B. Along the critical N A

C. Below the critical N A

D. None of the above

68. Weight of 12 mm dia for steel bar in running meter

A. 0.617 kg B. 0.890 kg

C. 0.888 kg D. 0.6698 kg

69. Maximum deflection of a cantilever with a uniformly distributed load is :

A. $Wl^3/6EI$ B. $Wl^3/384EI$

C. $Wl^3/ 8EI$ D. $Wl^3/12EI$

70. Stirrups are used to resist

A. Tensile stress B. Compressive stress

C. Shear stress D. Bending stress

71. Flexural strength of concrete is

A. 0.1 $\sqrt{fck}N/mm^2$ B. $0.7\sqrt{fck}N/mm^2$

C. $2\sqrt{fck}$ N/mm^2 D. $2f_{ck}$ N/mm^2

72. In the theory of simple bending moment of resistance M equal to

A. M = E /R B. M = l/Y

C. M = lZ D. M = FZ

73. The target mean strength of concrete is given by

A. $f_t = K * f_{ck} + s$ B. $f_t = f_{ck} + K * s$

C. $f_t = f_{ck} + s$ D. $f_t = f_{ck} + K$

74. Saddles are used

A. To resist the negative BM

B. To keep the spacing between the layers of reinforcement

C. To resist the tensile stress

D. To resist the shear stress

75. Unit of measurement for payment RCC works is

A. 1 m^3 B. 1d m^3

C. 10 dm^3 D. 10m^3

76. The restaurant of two forces P and Q acting at an angleθmakes an angle a with P 'α' is given by

A. Tan α= Q sin θ/ (P+Qcos θ)

B. Tanα = P sin θ/ (P+Qcos θ)

C. Tanα= P sin θ/ (P-Qcos θ)

D. Tan α= Q sin θ/ (P-Qcosθ)

77. Static friction

A. Always less than kinetic friction

B. Is always a constant

C. Is the product of normal force and angle of friction

D. Increases with applied force

78. The polar MI of a circle about its centroidal axis is

A. $\pi d^4/64$ B. $\pi d^4/32$

C. $\pi d^4/36$ D. $\pi d^4/16$

79. A small hole is scooped out from a body and filled with denser material, then the CG of the body

A. Moves towards the hole

B. Moves away from the hole

C. Remains unaltered in position

D. Centroid changes in position

80. Varignon's theorem of moments states that the

A. Algebraic sum of all moments is Zero

B. Algebraic sum of all moments is equal to the moments of the restaurant about the origin

C. Moments of a force is equal to sum of moments of its components

D. Sum of all moments is equal to the resultant couple

81. A projectile projected in a horizontal plane has a velocity = 1 m/s and α=45° its horizontal range is

A. 9.81 m B. 1/9.81m

C. 19.62 m D. 1/9.62 m

82. Rainfall is measured by

A. Water meter B. Current meter

C. Rain guage D. Screw gauge

83. The following is not a conservative force

A. Gravity force B. Elastic force

C. Friction force D. Spring force

84. In a direct impact, a ball of mass 10 kg moving at 2 m/s strikes a stationary ball of mass 2 kg. the moving ball comes to rest after collision.

The velocity of the second ball is

A. 12 m/s B. 20 m/s

C. 2 m/s D. 10 m/s

85. If α is the angular acceleration, the torque T is given by

A. $T = I/\alpha$ B. $T = I\alpha$

C. $I = T/\alpha^2$ D. $\alpha = T\omega$

86. From among the numerical values given select the range valid for the soil parameter, porosity (n) is such that

A. $n \leq 0$ B. $0 < n < 100$

C. $0 \leq n \leq 100$ D. $0 \leq n$

87. Consistency index < 1 indicates that

A. The soil is in the plastic state

B. The soil is at the plastic limit

C. The soil is at the liquid limit

D. The soil is at the liquid state

88. Inert material of cement concrete mix is

A. Water B. Aggregate

C. Cement D. None of these

89. The hydraulic gradient 'I' has the unit of

A. Velocity B. Time

C. Dimensionless D. Length

90. The following is not a correct statement

A. Effective stress in a soil is unaltered by an upward flow

B. Shear strength of soil is a function of effective stress

C. Soil lose shear strength when effective stress reduce zero

D. Soil under quick condition tends to suck into itself anything that treads upon it

91. Over consolidation ratio (OCR) of normally consolidated clays is

A. OCR <1 B. OCR > 1

C. OCR D. OCR = 1

92. Shear strength of a soil is a unique function of

A. Total strength B. Effective stress

C. Compressibility D. None of these

93. The correction for SPT value for N > 15 is

A. N" =15-(N'+15)/2

B. N" =15+(N'-15)/2

C. N" =15+(N'+15)/2

D. N" =15-(N'-15)/2

94. In developing bearing capacity equation it is assumed that

A. The footing is at ground level

B. The footing is circular in shape

C. The footing is square in shape

D. The footing is very long

95. Liquidity index is given by:

A. W-Wp/Ip B. W -Wp / Ip

C. Wl -W / Ip D. None of these

96. Newton's law of viscosity sates that

A. Shear stress is directly proportional to velocity

B. Shear stress is directly proportional to velocity gradient

C. Shear stress is directly proportional to shear strain

D. Shear stress is directly proportional to viscosity

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

A. Mass B. Momentum

C. Energy D. None of these

98. The coefficient of velocity for an orifice is : (Where Cv=coefficient of velocity; H= head ; X=horizontal distance traversed and Y= vertical distance

A. $Cv = \sqrt{\frac{4x^2}{yH}}$ B. $Cv = \frac{2x}{\sqrt{4yH}}$

C. $Cv = \sqrt{\frac{2x^2}{yH}}$ D. $Cv = \sqrt{\frac{x^2}{4yH}}$

99. Hydraulic gradient line 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

100. Reynolds's number is defined as the ratio of

A. Inertia force to viscous force

B. Inertia force to gravity force

C. Viscous force to gravity force

D. Viscous force to elastic force

ANSWER KEY

1	**B**	21	**B**	41	**C**	61	**B**	81	**B**
2	**C**	22	**A**	42	**B**	62	**D**	82	**C**
3	**B**	23	**C**	43	**A**	63	**D**	83	**C**
4	**B**	24	**C**	44	**D**	64	**B**	84	**D**
5	**A**	25	**A**	45	**D**	65	**B**	85	**B**
6	**D**	26	**B**	46	**C**	66	**B**	86	**C**
7	**D**	27	**A**	47	**C**	67	**C**	87	**A**
8	**B**	28	**D**	48	**B**	68	**C**	88	**B**
9	**B**	29	**C**	49	**C**	69	**C**	89	**C**
10	**D**	30	**C**	50	**A**	70	**C**	90	**A**
11	**A**	31	**A**	51	**D**	71	**B**	91	**D**
12	**C**	32	**D**	52	**B**	72	**D**	92	**B**
13	**B**	33	**C**	53	**C**	73	**B**	93	**B**
14	**C**	34	**D**	54	**B**	74	**B**	94	**D**
15	**A**	35	**B**	55	**C**	75	**C**	95	**A**
16	**A**	36	**C**	56	**C**	76	**A**	96	**B**
17	**B**	37	**A**	57	**D**	77	**D**	97	**C**
18	**C**	38	**B**	58	**B**	78	**B**	98	**D**
19	**D**	39	**D**	59	**A**	79	**A**	99	**D**
20	**D**	40	**B**	60	**A**	80	**C**	100	**A**