BKR/BNB
PROVISIONAL ANSWER KEY

Name of the post	**Deputy Executive Engineer (Civil), Class-2, Gujarat Water Resources Development Corporation/Gandhinagar Municipal Corporation**
Advertisement No.	**37, 54/2024-25**
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THE LINK FOR ONLINE OBJECTION SYSTEM WILL START FROM 27-05-2025 ; 10:00 AM ONWARDS

Instructions / સૂચના

Candidate must ensure compliance to the instructions mentioned below, else objections shall not be considered: -

(1) Candidates have to pay fees of Rs.100/- for each objection. The fees can be paid from the link given herewith.

(2) The Candidate will be able to submit objection only after payment of the fees. The generation of the receipt will only be considered as final submission.

(3) The Candidate must retain the receipt of the payment of the fees. The fees, once paid, will not be refunded under any circumstances.

(4) All the objections should be submitted through **ONLINE OBJECTION SUBMISSION SYSTEM** only. Physical or submission through any other means will not be considered.

(5) All objections are to be submitted with reference to the Master Question Paper published with provisional answer key, published herewith on the website / online objection submission system. Objections should be sent referring to the Question No. & options of the Master Question Paper. Objections regarding question nos. and options other than provisional answer key (Master Question Paper) shall not be considered.

(6) Objections and answers suggested by the candidate should be in compliance with the responses given by him in his answer sheet. Objections shall not be considered, in case, if responses given in the answer sheet /response sheet and submitted objections are differed.

(7) Supportive document to the objection must be uploaded, without which objection will not be considered.

ઉમેદવારે નીચેની સૂચનાઓનું પાલન કરવાની તકેદારી રાખવી, અન્યથા વાંધા-સૂચન અંગે કરેલ રજૂઆતો ધ્યાને લેવાશે નહીં

(1) ઉમેદવારે દરેક વાંધા દીઠ રૂપિયા ૧૦૦/-ફી ભરવાની રહેશે. જે ફી આ સાથે આપેલ લીંક ઉપરથી ભરી શકાશે.

(2) ફી ભર્યા બાદ જ વાંધો સબમીટ થઈ શકશે. ફી ભર્યાની આખરી પહોંચ જ આખરી સબમીશન ગણાશે.

(3) ફી ભર્યાની પહોંચ ઉમેદવારે સાચવી રાખવાની રહેશે. એક વાર ભરેલ ફી કોઈ પણ પરિસ્થિતિમાં પરત આપવામાં આવશે નહિ.

(4) વાંધા ફક્ત **ઓનલાઈન ઓબ્જેકશન સબમીશન સીસ્ટમ** દ્વારા જ સબમીટ કરવાના રહેશે. રૂબરૂ, ટપાલ અથવા ઈ-મેઈલ કે અન્ય કોઈ રીતે આયોગને મોકલવામાં આવેલ વાંધા ધ્યાને લેવામાં આવશે નહીં, જેની ખાસ નોંધ લેવી.

(5) ઉમેદવારે પોતાને પરીક્ષામાં મળેલ પ્રશ્નપુસ્તિકામાં છપાયેલ પ્રશ્નક્રમાંક મુજબ વાંધા-સૂચનો રજૂ ન કરતાં, તમામ વાંધા-સૂચનો વેબસાઈટ પર પ્રસિધ્ધ થયેલ પ્રોવિઝનલ આન્સર કી (માસ્ટર પ્રશ્નપત્ર) ના પ્રશ્નક્રમાંક મુજબ અને તે સંદર્ભમાં રજૂ કરવા. માસ્ટર પ્રશ્નપત્રમાં નિર્દિષ્ટ પ્રશ્ન અને વિકલ્પ સિવાયના વાંધા ધ્યાને લેવામાં આવશે નહીં.

(6) ઉમેદવારે પ્રશ્નના વિકલ્પ પર વાંધો રજૂ કરેલ છે અને વિકલ્પ રૂપે જે જવાબ સૂચવેલ છે એ જવાબ ઉમેદવારે પોતાની ઉત્તરવહીમાં આપેલ હોવો જોઈએ. ઉમેદવારે સૂચવેલ જવાબ અને ઉત્તરવહીનો જવાબ ભિન્ન હશે તો ઉમેદવારે રજૂ કરેલ વાંધા ધ્યાને લેવાશે નહીં.

(7) વાંધા માટે સંદર્ભ જોડવો આવશ્યક છે, જેના વિના વાંધો ધ્યાને લેવામાં આવશે નહીં.

Website link for online objection submission system: https://www.formonline.co.in/GPSC_TRACK/SearchPage.aspx

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1. **The nominal thickness of a boundary layer is generally considered as the distance from the wall to the point where the flow velocity is**

   (A) 50% of the free stream velocity.

   (B) 90% of the free stream velocity.

   (C) 99% of the free stream velocity.

   (D) 100% of the free stream velocity.

2. **The velocity profile in a laminar boundary layer over a flat plate can be best described by which of the following profile?**

   (A) Parabolic **(B) Linear**

   (C) Logarithmic **(D) Exponential**

3. **The local drag coefficient (C_f) at a point on a flat plate is defined as**

   (A) The ratio of the local shear stress to the dynamic pressure

   (B) The ratio of the total drag force to the dynamic pressure and reference area

   (C) The ratio of the pressure force to the dynamic pressure and reference area

   (D) The ratio of the local velocity to the free stream velocity

4. **The Reynolds stress in a turbulent boundary layer is associated with**

   (A) Mean flow velocities

   (B) Pressure gradients

   (C) Fluctuating components of velocity

   (D) Viscous shear stresses

5. **Which dimensionless number is used to determine whether the flow is dominated by inertial or viscous forces?**

   (A) Reynolds number

   (B) Froude number

   (C) Lift coefficient

   (D) Drag coefficient

6. **In a streamlined body, the drag force is primarily due to**

   (A) Pressure drag **(B) Friction drag**

   (C) Form drag **(D) Wave drag**

7. **The Magnus effect is related to**

   (A) Drag force only **(B) Lift force on rotating bodies**

   (C) Flow over a flat plate **(D) Surface tension forces**

8. The term 'stagnation pressure' refers to the pressure at a point where

(A) Velocity is maximum
(B) Velocity is zero
(C) Flow is turbulent
(D) Flow is laminar

9. The Darcy-Weisbach equation is expressed as

(A) $h_f = f\frac{L}{D}\frac{V^2}{2g}$
(B) $h_f = \frac{L}{D}\frac{fV^2}{2g}$
(C) $h_f = f\frac{2gL}{D}$
(D) $h_f = \frac{2g}{fLD}$

10. For smooth pipes, the friction factor in laminar flow is given by

(A) $f = \frac{64}{Re}$
(B) $f = \frac{16}{Re}$
(C) $f = 0.079Re^{0.25}$
(D) None of the above

11. The equivalent length method in pipe networks accounts for

(A) Minor losses only
(B) Major losses only
(C) Pipe diameter changes
(D) None of the above

12. The force exerted by a jet on a moving flat plate is

(A) More than that on a stationary plate
(B) Equal to that on a stationary plate
(C) Less than that on a stationary plate
(D) Zero

13. In an open channel flow, the velocity is maximum at

(A) The bottom of the channel
(B) The sides of the channel
(C) just below the water surface
(D) The top water surface near the channel boundaries

14. In gradually varied flow, the flow profile is determined by

(A) The Froude number only
(B) The slope of the channel, flow depth and flow type
(C) The discharge and Manning's coefficient
(D) The type of sediment in the flow

15. The specific energy curve is used to analyze
(A) Energy loss in pipes
(B) Energy at different sections of open channel flow
(C) Uniform flow only
(D) Changes in velocity in a closed conduit

16. In a specific energy diagram, alternate depths are located
(A) At the peak of the curve
(B) At different energy levels
(C) On either side of the critical depth
(D) Only for subcritical flows

17. When the specific energy is greater than the minimum specific energy, the flow can be
(A) Only supercritical
(B) Only subcritical
(C) Either subcritical or supercritical
(D) Always critical

18. What is the primary difference between uniform and non-uniform flow in the open channels?
(A) Non-uniform flow has changing water temperature
(B) Uniform flow has a constant velocity across sections
(C) Non-uniform flow has no frictional resistance
(D) Uniform flow occurs only in pipes

19. For turbulent flow in rough pipes, the velocity distribution near the wall is modified to account for roughness. The equivalent roughness height ks is used in place of
(A) Pipe diameter D
(B) Kinematic viscosity v
(C) Distance from the wall y
(D) Roughness Reynolds number Re_k

20. The friction loss in a non-circular conduit for turbulent flow is generally
(A) Independent of the conduit shape
(B) Dependent on the hydraulic diameter and roughness
(C) Lower than in circular conduits
(D) Higher than in circular conduits

21. The sum of the static head and elevation head provides the contour of

(A) total energy line

(B) hydraulic grade line

(C) velocity head

(D) none of the above

22. The volume flow rate through a pipe is

(A) $\frac{\pi D^4 \Delta p}{128 \mu l}$

(B) $\frac{\pi D^4 \Delta p}{64 \mu l}$

(C) $\frac{\pi D^2 \Delta p}{128 \mu l}$

(D) None of the above

23. The broad crested weir with width B and the height of the liquid surface upstream of weir as H is one for which

(A) $1.5H \leq B \leq H$

(B) $2.5H \leq B \leq 10H$

(C) $2.5H \leq B \leq 20H$

(D) none of these

24. The total depth of water over irrigated land required by a crop grown on it during the entire base period of the crop is known as

(A) Delta of irrigation

(B) Duty

(C) Capacity factor

(D) None of these

25. The ratio of the mean supply discharge of a canal for a certain duration to its maximum discharge capacity is defined as

(A) duty

(B) capacity factor

(C) delta of irrigation

(D) none of these

26. The twelve-month period starting and finishing at the time of seasonal minimum flow is defined as the

(A) available period

(B) wilting period

(C) reservoir lag

(D) water year

27. A dam that detains all or part of the flood waters of a river and gradually releases the stored water at controlled rates so that the entire region on the downstream side of the dam may be safeguarded against possible damage due to floods is known as

(A) detention dam

(B) diversion dam

(C) cofferdam

(D) none of these

28. The method using continuity equation and conservation of momentum for flood routing is known as

(A) Method of images
(B) Hydraulic routing method
(C) Runge Kutta method
(D) Flood routing method

29. To observe the cyclic trend present in the rainfall data, which of the following plot would be useful?

(A) Depth-area-duration curve
(B) Moving average curve
(C) Intensity-duration curve
(D) Double mass curve

30. For the determination of an average annual precipitation in a catchment basin, the best method is

(A) Arithmetical method
(B) Thiessen's mean method
(C) Isohyetal method
(D) None of these

31. The base flow is the difference between

(A) The total runoff and the direct runoff
(B) The total runoff and the delayed subsurface runoff
(C) The prompt subsurface runoff and the delayed subsurface runoff
(D) The total runoff and the prompt subsurface runoff

32. Which assumption of the unit hydrograph theory is not required in the application of IUH?

(A) The rainfall is uniformly distributed over the basin
(B) The rainfall is uniformly distributed within the storm duration
(C) The principle of linearity
(D) The principle of time invariance

33. The energy loss ΔE in a hydraulic jump depends on

(A) conjugate depth
(B) initial depth
(C) sequent depth
(D) none of these

34. Pipe network problems are solved based on

(A) Euler equation
(B) Navier-Stokes equation
(C) Manning's equation
(D) Darcy-Weisbach equation

35. For a Pelton wheel turbine, the velocity of the wheel at the pitch circle is proportional to

(A) speed ratio
(B) square root of net head
(C) both (A) and (B)
(D) none of these

36. The discharge through a Francis turbine depends on
(A) a factor that allows for the thickness of the vanes
(B) the velocity of flow
(C) both (A) and (B)
(D) none of the above

37. The sediment transported by a stream or channel may be divided into
(A) Bed load
(B) Suspended load
(C) Wash load
(D) All of these

38. The flow duration curve is a plot of
(A) Flow against its time of occurrence in chronological order.
(B) Flow in ascending order against the percentage of time in chronological order.
(C) Flow that equalled or exceeded against the percentage of time.
(D) Flow against the duration of time for which it is sustained.

39. The distorted models used in the hydraulic studies are those which
(A) have an exaggeration of the vertical scale and horizontal scale.
(B) are not geometrically similar to the prototypes.
(C) have the same vertical and horizontal scale as that of the prototypes.
(D) have the same Froude number as that for the prototypes.

40. Water existing in the capillary zone is a part of
(A) gravity water
(B) vadose water
(C) phreatic water
(D) groundwater

41. The stream contributing runoff to groundwater is known as
(A) influent stream
(B) effluent stream
(C) ephemeral stream
(D) perennial stream

42. For an unconfined aquifer, which of the following is the alternative name?
(A) a leaky aquifer
(B) a water table aquifer
(C) a perched aquifer
(D) an artisan aquifer

43. The specific capacity of an open well has the dimension of
(A) L^{-1}
(B) T^{-1}
(C) LT^{-1}
(D) TL^{-1}

44. The most often used formula for estimating the return period is

(A) Hazen's formula
(B) Beard's formula
(C) California formula
(D) Weibull's formula

45. In an open channel flow, the Saint Venant equation represents

(A) Continuity and momentum equation
(B) Continuity equation in two different forms
(C) Momentum equation in two different forms
(D) Momentum and energy equations

46. Stopping sight distance is sufficient to stop the vehicle under

(i) Normal condition (ii) complex situation

(A) Only (i)
(B) (i) and (ii)
(C) Only (ii)
(D) None of these

47. Which of the following roads is not coming under the category of urban roads?

(A) Arterial road
(B) Local road
(C) Expressway
(D) Sub-arterial road

48. According to the Indian Road Congress guidelines, what is the value of the height of driver's eye above road surface?

(A) 1.0 m
(B) 1.2 m
(C) 1.4 m
(D) 1.6 m

49. If the speed of the overtaking vehicle is 80 km/h, then what will be the speed of the overtaken vehicle?

(A) 65 km/h
(B) 64 km/h
(C) 66 km/h
(D) 68 km/h

50. According to the Indian Road Congress, what is the value of an exceptional gradient for a road to be constructed in a mountainous terrain?

(A) 1 in 20
(B) 1 in 15
(C) 1 in 14.3
(D) 1 in 12.5

51. Calculate the mechanical widening required for a pavement of two lane road without raised kerb on a horizontal curve of radius 300 m if the longest wheel base of a vehicle expected on the road is 6.0 m.

(A) 0.10 m
(B) 0.12 m
(C) 0.14 m
(D) 0.16 m

52. The length of the transition curve is 24 m. The radius of the circular curve is 100 m. Estimate the value of shift.

(A) 0.20 (B) 0.24

(C) 0.28 (D) 0.32

53. Which of the following curves should not be used in summit curve?

(A) Circular curve (B) Parabolic curve

(C) Transition curve (D) All of these

54. Which of the following is the value of limiting gradient for a road to be constructed in a steep terrain?

(A) 1 in 20 (B) 1 in 16.7

(C) 1 in 14.3 (D) 1 in 12.5

55. What will be the value of intermediate sight distance for a road having a stopping sight distance of 180 m?

(A) 320 m (B) 340 m

(C) 360 m (D) 380 m

56. Which of the following code is used for the design of flexible pavement in India?

(A) IRC 115 (B) IRC 37:2018

(C) IRC 58:2015 (D) IRC SP:76-2015

57. Which of the following test is used for the estimation of modulus of subgrade reaction?

(A) Plate load test (B) Sand replacement test

(C) Direct shear test (D) Triaxial test

58. Which of the following is the value of maximum grade compensation for a horizontal curve of radius 150 m?

(A) 0.5% (B) 0.8%

(C) 1.1% (D) 1.4%

59. Which of the following sight distance is considered for the design of valley curve according to IS 73 (2023)?

(A) Intermediate sight distance (B) Overtaking sight distance

(C) Headlight sight distance (D) None of these

60. Which of the following capacity is considered as a design capacity?

(A) Basic capacity
(B) Possible capacity
(C) Practical capacity
(D) All of these

61. Which of the following bearing is not useful in bridge, experiencing the rotational movement?

(A) Rocker and Pin Bearing
(B) Sliding Bearing
(C) Elastomeric Bearing
(D) Curved Bearing

62. Which of the following bridge is used for the movement of trains?

(A) Beam Bridge
(B) Truss Bridge
(C) Suspension Bridge
(D) None of these

63. Which of the following is the correct sequence of layers used in flexible pavement from top to bottom?

(A) Bituminous layer, subgrade, base layer, subbase layer
(B) Base layer, bituminous layer, subbase layer, subgrade
(C) Bituminous layer, base layer, subbase layer, subgrade
(D) Bituminous layer, subbase layer, base layer, subgrade

64. Which of the following layer in flexible pavement is used as a drainage layer?

(A) Subbase layer
(B) Base layer
(C) Subgrade
(D) Bituminous layer

65. Which of the following equation is used for the estimation of radius of relative stiffness?

(A) $\left[\frac{E*h^3}{12*k*(1-\mu^2)}\right]^{1/2}$
(B) $\left[\frac{E*h^2}{12*k*(1-\mu^2)}\right]^{1/4}$
(C) $\left[\frac{E*h^2}{12*k*(1-\mu)}\right]^{1/4}$
(D) $\left[\frac{E*h^3}{12*k*(1-\mu^2)}\right]^{1/4}$

66. Which of the following is the correct value of maximum superelevation to be provided for the roads in hilly terrain with no snow?

(A) 2%
(B) 4%
(C) 7%
(D) 10%

67. Which of the following types of bridges is used for long span bridges?

(A) Guided bridges
(B) Girder bridges
(C) Roller bridges
(D) Trussed bridges

68. Which of the following is not a part of bridge superstructure?
(A) Pier
(B) Deck slab
(C) Girder
(D) Slab

69. The end supports of a bridge superstructure are termed as
(A) Piers
(B) Abutments
(C) Wing walls
(D) Abutment piers

70. In a signal design as per the Indian Road Congress specifications, if the sum of the ratios of normal flows to saturation flows of two directional traffic flows is 0.50 and the total lost time per cycle is 20s, then the optimum cycle length in seconds is
(A) 50
(B) 70
(C) 90
(D) 110

71. The traffic volume of a roadway is defined as the multiplication of
(A) Speed and time headway
(B) Speed and distance way
(C) Traffic density and speed
(D) Time headway and distance headway

72. What will be the theoretical maximum capacity for a single lane of highway, given that the speed of the traffic stream is 50 kmph?
(A) 3125 veh/h
(B) 3225 veh/h
(C) 3325 veh/h
(D) 3425 veh/h

73. The lost time due to starting delay on a traffic signal approach is noted as 2 seconds, the actual green time is 24 seconds and the amber time is 4 seconds. How much is the effective green time?
(A) 19 sec (B) 22 sec (C) 25 sec (D) 28 sec

74. Enoscope is used to find
(A) Average speed
(B) Spot speed
(C) Space-mean speed
(D) Time-mean speed

75. If a road surface has an inadequate superelevation on horizontal curve, then which one of the following is the correct statement?
(A) Pressure on inner wheel is higher than the outer wheel
(B) Pressure on both inner and outer wheels is equal
(C) Pressure on outer wheel is higher than the inner wheel
(D) None of the above

76. Match List-I (Name of stone) with List-II (Use of stone) and select the correct answer using the codes given below the lists.

List-I	List-II
a. Granite	1. Ornamental work
b. Marble	2. Ballast
c. Chalk	3. Rough stonework
d. Laterite	4. Manufacture of cement

Codes:

(A) a – 3, b – 1, c – 2, d – 4

(B) a – 2, b – 3, c – 1, d – 4

(C) a – 2, b – 1, c – 4, d – 3

(D) a – 1, b – 4, c – 2, d – 3

77. The strength of timber is maximum when the load applied is

(A) Parallel to grain

(B) Perpendicular to grain

(C) Inclined at 45° to grain

(D) Inclined at 60° to grain

78. The modulus of elasticity of high-tensile steel is

(A) Smaller than that of mild steel

(B) Equal to that of mild steel

(C) Larger than that of mild steel

(D) Equal to that of aluminum

79. King closers are related to

(A) Doors and windows

(B) King post truss

(C) Queen post truss

(D) Brick masonry

80. The expansion and shrinkage of plywood are comparatively very low as

(A) They are held in position by adhesives

(B) They are glued under pressure

(C) Plies are placed at right angles to each other

(D) They are prepared from veneers

81. Match List-I (Type of cement) with List-II (Characteristics) and select the correct answer using the codes given below the lists.

List I	List II
a. Air entering Portland cement	1. Sustainable for very large structures
b. Low heat Portland cement	2. Unsuitable for very large masses of concrete
c. Hydrophobic Portland cement	3. Greater resistance to frost attack
d. Rapid hardening Portland cement	4. Safe storage under unfavourable conditions of humidity

Codes:

(A) a – 4, b – 2, c – 1, d – 3

(B) a – 3, b – 4, c – 1, d – 2

(C) a – 3, b – 1, c – 4, d – 2

(D) a – 4, b – 1, c – 2, d – 3

82. If in a concrete mix the fineness modulus of coarse aggregate is 7.6, the fineness modulus of the fine aggregate is 2.8 and the economical value of the fineness modulus of combined aggregate is 6.4, then the proportion of fine aggregate is

(A) 25%

(B) $33\frac{1}{3}$ %

(C) 50%

(D) $66\frac{2}{3}$ %

83. The Bureau of Indian Standards classifies bitumen into grades 65/25, 85/40 etc. The first and the second numbers respectively refer to

(A) Softening point and penetration

(B) Penetration and softening point

(C) Flash point and penetration

(D) Flash point and softening point

84. Gypsum is used as an admixture in cement grouts for

(A) Accelerating the setting time

(B) Retarding the setting time

(C) Increasing the plasticity

(D) Reducing the grout shrinkage

85. Match List-I with List-II and select the correct answer using the codes given below the lists.

List-I	List-II
a. Deciduous	1. Softwood
b. Conifer	2. Hardwood
c. Endogenous	3. Eucalyptus
d. Exogenous	4. Bamboo

Codes:

(A) a – 1, b – 2, c – 3, d – 4

(B) a – 2, b – 1, c – 3, d – 4

(C) a – 2, b – 1, c – 4, d – 3

(D) a – 1, b – 2, c – 4, d – 3

86. Before testing the setting time of cement one should test for

(A) Soundness (B) Strength

(C) Fineness (D) Consistency

87. A splitting tensile test is performed on a cylinder of diameter D and length L. If the ultimate load is P, then splitting tensile strength of the concrete is given by

(A) $P/\pi DL$ (B) $2P/\pi DL$

(C) $4PL/\pi DL$ (D) $4PD/\pi L^3$

88. The most important purpose of frog in a brick is to

(A) Emboss manufacturer's name

(B) Reduce the weight of the brick

(C) Form keyed joint between brick and mortar

(D) Improve insulation by providing 'hollows'

89. Which of the following are included in tender documents?

(A) Tender notice (B) Tender form

(C) Conditions of contract (D) All of these

90. For the wider publicity of tender, tender notice is published in minimum _____ daily newspapers.

(A) One (B) Two

(C) Three (D) Four

91. EMD cannot be submitted in _____ form.

(A) Bank/Post Fixed Deposit Certificate

(B) National Savings Certificate

(C) Demand Draft

(D) Property Documents

92. The power of an executive engineer (upgraded division) for acceptance of tender in CPWD is up to Rs. _____.

(A) 2,00,000 (B) 5,00,000

(C) 10,00,000 (D) 15,00,000

93. Which of the following documents are supplied by the contractor during pre-qualification process?

(A) Experience Related Documents

(B) Financial Capacity Documents

(C) Technical Staff and Equipments Ownership Document

(D) All of the above

94. The front and top view are sometimes not sufficient to convey all the information regarding the object. Additional views are therefore projected on other planes known as _____.

(A) auxiliary vertical plane

(B) auxiliary inclined plane

(C) auxiliary plane

(D) horizontal and vertical plane

95. In _____, the direction of viewing is such that two of the three axes of space appear equally foreshortened.

(A) Orthographic projection (B) Trimetric projection

(C) Dimetric projection (D) Isometric projection

96. _____ area of a building is the area of verandahs, passages, corridors, balconies and porches.

(A) Floor area (B) Horizontal circulation area

(C) Vertical circulation area (D) Verandah area

97. What is a freestone?

(A) Stone free from impurities

(B) Stone that doesn't require dressing

(C) Metamorphic stone

(D) Stone free from veins and planes of cleavage

98. Strength of concrete shows an increase with _____.

(A) Decrease in rate of loading

(B) Increase in rate of loading

(C) Unaffected by the rate of loading

(D) None of the above

99. The proper size of a mould for testing compressive strength of cement is

(A) 7.05 cm cube (B) 10.05 cm cube

(C) 15 cm cube (D) 12.05 cm cube

100. Match List-I (Aggregate) with List-II (Effect) and select the correct answer using the codes given below the lists.

List-I	List-II
a. Rounded aggregates	1. Reduce workability appreciably because of a high ratio of surface area to volume
b. Crushed aggregates	2. Require more water than rounded aggregates and give strength lesser than crushed aggregates
c. Flaky aggregates	3. Give concrete of higher compressive strength due to development of stronger aggregate-mortar bond
d. Irregular aggregates	4. Require lesser amount of water and cement paste for a given workability

Codes:

(A) a – 1, b – 2, c – 4, d – 3

(B) a – 1, b – 3, c – 4, d – 2

(C) a – 4, b – 3, c – 1, d – 2

(D) a – 4, b – 2, c – 1, d – 3

101. Which one of the following is the working principle of concrete hammer for non-destructive test based?

(A) Rebound deflections (B) Radioactive waves

(C) Ultrasonic pulse (D) Creep recovery

102. The mix design for pavement concrete is based on

(A) The flexural strength

(B) The characteristics compressive strength

(C) The shear strength

(D) The bond strength

103. Consider the following statements:

Shrinkage of concrete depends upon the

1. Relative humidity of the atmosphere

2. Passage of time

3. Applied stress

Which of the statements is/are correct?

(A) 1 and 2 **(B) 2 and 3**

(C) 1 alone **(D) 1, 2 and 3**

104. Design Stress-Strain curve of concrete is

(A) A perfect straight line up to failure

(B) A straight line up to 0.002% strain value and then parabolic up to failure

(C) Parabolic up to 0.002% strain value and then a straight line up to failure

(D) Hyperbolic up to 0.002% strain value and then a straight line up to failure

★ **Directions: (Q No. 105 to 108)**

The following items consist of two statements, one labelled as 'Assertion (A)' and the other as 'Reason (R)'. You are to examine these two statements carefully and select the answers to these items using the codes given below:

105. ***Assertion*** **(A): Pozzolana is added to cement to increase early strength.**

Reason **(R): It offers greater resistance to the permeability of water.**

(A) Both A & R are true and R is the correct explanation of A

(B) Both A & R are true but R is not the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

106. *Assertion* (A): For identical mix, the cube compressive strength of concrete obtained from 15 cm cube is higher than 15×30 cm cylinder compressive strength.

Reason (R): Cube compressive strength is higher than the cylinder compressive strength because of its higher contact area under the load.

(A) Both A & R are true and R is the correct explanation of A

(B) Both A & R are true but R is not the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

107. A*ssertion* (A): Flash set is the stiffening of the cement paste within a few minutes after mixing.

Reason (R): Flash set occurs due to insufficient gypsum to control the rapid reaction of C_3A with water.

(A) Both A & R are true and R is the correct explanation of A

(B) Both A & R are true but R is not the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

108. *Assertion* (A): Timbers used for engineering construction are derived from deciduous trees.

Reason (R): Deciduous trees yield hardwood while conifers yield softwood.

(A) Both A & R are true and R is the correct explanation of A

(B) Both A & R are true but R is not the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

109. In resources levelling,

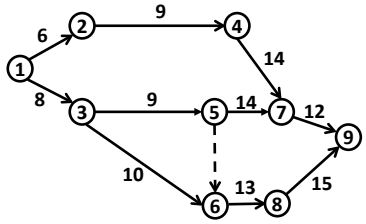
(A) the total duration of project is reduced

(B) the total duration of project is increased

(C) the uniform demand of resources is achieved

(D) the cost of project is controlled

110. The flow net of activities of a project is given in the following figure. The duration of activities are indicated along the arrows



The critical path of the activities is along

(A) 1-2-4-7-9 (B) 1-3-5-7-9 (C) 1-3-6-8-9 (D) 1-3-5-6-8-9

111. For a given activity, the optimistic time, pessimistic time and the most probable estimates are 5, 8 and 17 days respectively

Activity	Starts at week number	Ends with week number	Resources needed per week
A	9th	16th	6
B	11th	20th	4
C	15th	22nd	3
D	13th	24th	7

The expected time is

(A) 8 days (B) 9 days (C) 10 days (D) 15 days

112. Match List-I with List-II and select the correct answer using the codes given below the list

List-I	List-II
a. Derick	1. Stone masonry work
b. Claw-hammer	2. Wood work
c. Chain-Lewis	3. Steel work
d. Drop-hammer	4. Concrete compaction
	5. Pile foundation

Codes:

(A) a – 1, b – 3, c – 5, d – 4
(B) a – 2, b – 3, c – 4, d – 5
(C) a – 3, b – 1, c – 5, d – 2
(D) a – 3, b – 2, c – 1, d – 5

113. The most suitable type of equipment for compacting of cohesive soils is

(A) smooth-wheeled rollers (B) vibratory rollers
(C) sheep foot rollers (D) tampers

114. The probability distribution taken to represent the completion time in PERT analysis is

(A) gamma distribution (B) normal distribution

(C) beta distribution (D) log-normal distribution

115. A centrifugal pump is required to lift 2.8 cum/s of water to a height of 7.5m. If the total loss of head in the pipe system is 0.25 m and the efficiency of the pump is 80%, then the brake horse power will be

(A) $\frac{1000 \times 2.8 \times 7.5 \times 0.8}{75}$ (B) $\frac{1000 \times 2.8 \times 7.75}{0.8}$

(C) $\frac{1000 \times 2.8 \times 7.75}{0.8 \times 75}$ (D) $\frac{1000 \times 2.8 \times 7.75}{75}$

116. There are four consecutive activities in a simple linear network, each with mean duration of T and each with 'k' as the standard deviation of its duration. The overall project duration through these activities is likely to be in the range

(A) 4T ± k (B) 4T ± 2k (C) 4T ± 4k (D) 4T ± 6k

117. Which one of the following project management techniques is deterministic in nature?

(A) CPM (B) PERT (C) GERT (D) LCES

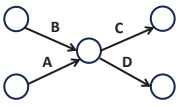
118. What is the volume of concrete mix produced, if a batch type concrete mixer of 1500 litres capacity takes an effective time of 15 seconds for one batch of production?

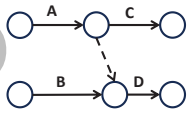
(A) 36 m^3/hr (B) 180 m^3/hr (C) 360 m^3/hr (D) 720 m^3/hr

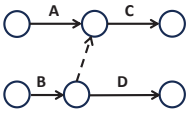
119. A bulldozer operates on a 30 m stretch and moves at 2.4 kmph when pushing the earth, and returns empty at 6 kmph. The time lost in loading and shifting gears per trip is 18 seconds. Its operating factor is nearly 50 min/hour. What is the number of trips made per hour?

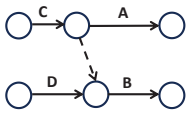
(A) 31 (B) 33 (C) 35 (D) 37

120. Activity 'C' follows activity 'A' and activity 'D' follows activities 'A' and 'B'. The correct network for the project is

(A) 

(B) 

(C) 

(D) 

121. According to the maximum principal stress theory, what is the ratio between normal stress to yield stress of a material such that yielding of material takes place?

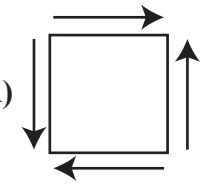
(A) 1/2 (B) 1 (C) $\sqrt{2}$ (D) 2

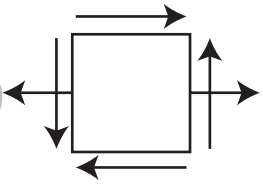
122. For the case of plane stress problem, an element is subjected to bi-axial tensile. The normal stresses are 10 MPa and 5 MPa and shear stress is 6 MPa. If one of the principal stress is 1 MPa, then what is the other value of the principal stress?

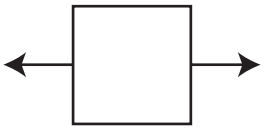
(A) 5 MPa (B) 7.5 MPa

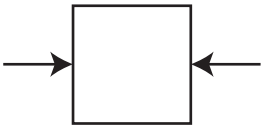
(C) 10 MPa (D) 14 MPa

123. Which of the following diagram correctly represents the state of stress at a point above the neutral axis of the cantilever beam with uniformly distributed load with intensity "q"?

(A) 

(B) 

(C) 

(D) 

124. If a plane is equally inclined to x and y axes but outward normal of the plane is perpendicular to z axis then what will be the direction cosines of the plane?

(A) $\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 0\right)$ (B) $\left(\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, 0\right)$ (C) $\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 1\right)$ (D) $\left(\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, 1\right)$

125. If matrix $A = \begin{bmatrix} 2 & -1 & -2 \\ -1 & 2 & 0 \\ -2 & 0 & -4 \end{bmatrix}$, then find the trace of matrix A.

(A) – 20 (B) – 4

(C) 0 (D) 4

126. As per the maximum principal stress theory, when a shaft is subjected to a bending moment M and torque T and if σ is the allowable stress in axial tension, then the radius "r" of the shaft is given by

(A) $r^3 = \frac{2}{\pi\sigma}\left(M + \sqrt{M^2 + T^2}\right)$ (B) $r^3 = \frac{4}{\pi\sigma}\left(M + \sqrt{M^2 + T^2}\right)$

(C) $r^3 = \frac{1}{2\pi\sigma}\left(M + \sqrt{M^2 + T^2}\right)$ (D) $r^3 = \frac{1}{\pi\sigma}\left(M + \sqrt{M^2 + T^2}\right)$

127. A solid circular column of radius "r" is subjected to compressive point load. The maximum distance of the point of application of load from the centre for no tension is

(A) r (B) $\frac{r}{2}$ (C) $\frac{r}{4}$ (D) $\frac{r}{8}$

128. A cantilever beam with inverted T cross-section carries uniformly distributed load. Where does the maximum magnitude of the bending stress occur?

(A) At the top of cross-section

(B) At the mid-depth joint

(C) At the junction of flange and web

(D) At the bottom of the section

129. The shear stress at the neutral axis in a beam of rectangular section with width is equal to 25 mm and effective depth 50 mm subjected to shear force of 5 kN is

(A) 5 MPa (B) 6 MPa

(C) 10 MPa (D) 15 MPa

130. The cross-section of a bar is subjected to a uni-axial tensile stress "p". The shear stress on a plane inclined at θ to the cross-section of the bar would be

(A) $\frac{p \sin 2\theta}{2}$ (B) $p \sin 2\theta$

(C) $p \cos 2\theta$ (D) $\frac{p \cos 2\theta}{2}$

131. If all the dimensions of a prismatic bar of circular cross-section suspended freely from the ceiling of a roof are doubled, then the total elongation produced by its own weight will increase

(A) 2 times (B) 4 times (C) 8 times (D) 16 times

132. Consider the following statements, choose the correct option

Assertion (A): A mild steel tension specimen has a cup and cone fracture at failure.

Reason (R): Mild steel is weak in shear and failure of the specimen in shear takes place at 45° to the direction of the applied tensile force.

(A) Both A and R are correct and R is the correct explanation for A

(B) Both A and R are correct but R is not the correct explanation for A

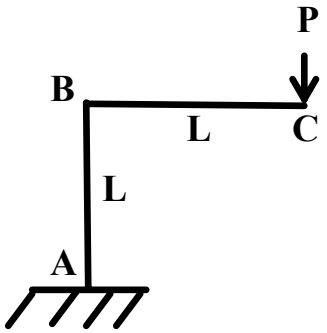
(C) A is correct but R is false

(D) A is false but R is correct

133. What is the slope at the free end of a cantilever beam of length "l" subjected to a moment M at the free end? EI is flexural rigidity of the beam.

(A) $\frac{Ml}{2EI}$ (B) $\frac{Ml}{EI}$ (C) $\frac{Ml^2}{EI}$ (D) $\frac{Ml^2}{2EI}$

134. What is the horizontal deflection at free end C of the frame shown in the figure? EI is flexural rigidity of both the members.



(A) $\frac{PL^3}{3EI}$

(B) $\frac{PL^3}{2EI}$

(C) $\frac{PL^2}{3EI}$

(D) $\frac{PL^2}{2EI}$

135. What is the condition for the degree of static indeterminacy of space frame, where m is the number of members, n is the number of joints and r is the number of reaction?

(A) 3m + r – 3j

(B) m + r – 3j

(C) 6m + r – 6j

(D) m + r – 6j

136. A uniform beam of span l is fixed at both the supports. It carries a uniformly distributed load q per unit length. The bending moment at quarter span is

(A) $\frac{ql^2}{8}$

(B) $\frac{ql^2}{16}$

(C) $\frac{ql^2}{32}$

(D) $\frac{ql^2}{96}$

137. Three-hinged symmetrical parabolic arch of span 12 m and rise 2 m carries a uniformly distributed load of 1 kN/m for the whole span. The bending moment at the quarter point is

(A) 15 kNm

(B) 10.5 kNm

(C) 6 kNm

(D) 0

138. A uniform beam of length *'l'* and flexural rigidity 2EI is fixed at both the ends. What is the moment required for unit rotation at the centre of span?

(A) $\frac{4EI}{L}$

(B) $\frac{8EI}{L}$

(C) $\frac{2EI}{L}$

(D) $\frac{32EI}{L}$

139. What is the total number of kinematic indeterminacy of a simply supported beam with extensible member?

(A) 0 (B) 1 (C) 2 (D) 3

140. A pin jointed plane frame is unstable if

(A) $m + r < 2j$ (B) $m + r = 2j$

(C) $m + r > 2j$ (D) none of these

141. The principle of superposition is not applicable when

1) the material obeys Hooke's law

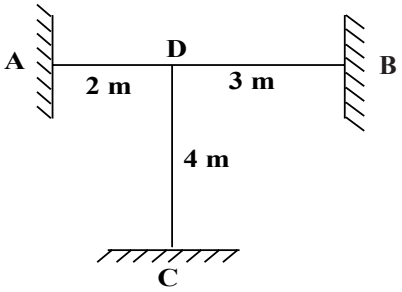
2) the effect of temperature changes are not taken into consideration

3) the yielding of support of structure takes place

Which of the above statements is/are correct?

(A) 2 only (B) 1 and 2 (C) 3 only (D) 2 and 3

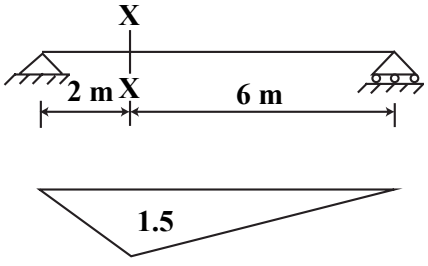
142. For the frame shown in the figure, the distribution factors for members DA, DB and DC are _____ respectively (Assume EI is same for all the members)



(A) 6/13, 4/13 and 3/13 (B) 3/13, 4/13 and 6/13

(C) 4/13, 3/13 and 6/13 (D) none of these

143. The given figure shows a beam with its influence line diagram (ILD) for bending moment (BM) at section X-X



ILD of BM at section X-X

The value of the bending moment at section X-X due to a concentrated load of 10 kN placed at mid-span is

(A) 2.5 kNm (B) 7.5 kNm

(C) 5 kNm (D) 10 kNm

144. The limit of percentage "p" of the longitudinal reinforcement in a column is

(A) 0.8% to 2%
(B) 0.8% to 4%
(C) 0.8% to 6%
(D) 0.8% to 8%

145. Which combination of partial safety factors for load under limit state of serviceability is not correct?

(A) DL + LL
(B) DL + WL
(C) DL + LL + WL
(D) DL + 0.8 (LL+WL)

146. As per limit state of collapse, the value of partial safety factors for steel and concrete are taken as

(A) 1.5, 1.05
(B) 1.15, 2
(C) 1, 1.5
(D) 1.15, 1.5

147. As per limit state of collapse, the partial safety factors for concrete and steel are 1.5 and 1.15 respectively, because

(A) the concrete is hetrogenous while steel is homogenous
(B) the control on the quality concrete is not as good as that of steel
(C) the concrete is weak in tension
(D) the voids in concrete are 0.5% while those in steel are 0.15%

148. According to limit state method, the ratio of rectangular stress block to the parabolic stress block in a balanced RCC beam is

(A) 3/7
(B) 4/7
(C) 3/4
(D) 4/3

149. If σ_{cbc} is permissible compressive stress in flexural compression in N/mm^2 in service, the modular ratio is of the order of

(A) $\frac{280}{\sigma_{cbc}}$
(B) $\frac{280}{2\sigma_{cbc}}$
(C) $\frac{280}{3\sigma_{cbc}}$
(D) $\frac{280}{4\sigma_{cbc}}$

150. According to limit state method, what is the maximum area of compression reinforcement in a beam, where d, b and D are the effective depth, width and overall depth of beam respectively?

(A) 0.04bD
(B) 0.04bd
(C) 0.4bD
(D) 0.4bd

151. Bending moments due to dead load, live load, wind load and seismic load at service conditions on a RC beam are 10 kNm, 5 kNm, 12 kNm and 15 kNm respectively. The design load under limit state collapse is

(A) 22.5 kNm
(B) 36 kNm
(C) 37.5 kNm
(D) 45 kNm

152. According to IS 456:2000, equivalent moment in rectangular RCC beam under torsion can be calculated as

(A) $M_{e1} = M_u + \frac{(1+b/D)}{1.7}$
(B) $M_{e1} = M_u + \frac{(1-b/D)}{1.7}$
(C) $M_{e1} = M_u + \frac{(1+D/b)}{1.7}$
(D) $M_{e1} = M_u + \frac{(1-D/b)}{1.7}$

153. What is the value of span to effective depth ratio for vertical deflection limits of an RC beam of span 16m?

(A) 7
(B) 12.5
(C) 20
(D) 26

154. Find the initial prestressing force for a prestressed concrete beam, if beam is subjected to final prestressing force of 300 kN. The net loss in beam is 25%.

(A) 75
(B) 300
(C) 375
(D) 400

155. According to IS 800: 2007, what is the effective length of prismatic compression member of length *l*, if rotation and translation both degree of freedoms are restrained at one end of member and at other end of member transnational degree of freedom is allowed and rotational degree of freedom is fixed?

(A) 0.8*l*
(B) *l*
(C) 1.2*l*
(D) 2*l*

156. How many classes of cross-section are defined in IS 800: 2007 to avoid the local buckling by limiting the width to thickness ratio?

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

157. What is the expression for the plastic modulus of rectangular section of width b and depth d?

(A) $\frac{bd^2}{8}$
(B) $\frac{bd^2}{6}$
(C) $\frac{bd^2}{4}$
(D) $\frac{bd^2}{2}$

[Contd.

158. Which of the following is not a compression member?

(A) strut (B) tie (C) rafter (D) boom

159. As per IS: 800, in the case of a plate girder with vertical and horizontal stiffeners, the greater and lesser unsupported clear dimension of a web panel in terms of web thickness t_w should not exceed _____ respectively.

(A) 180 t_w and 85 t_w (B) 270 t_w and 180 t_w

(C) 270 t_w and 200 t_w (D) 400 t_w and 250 t_w

160. The thickness of the base plate is determined from the

(A) flexural strength of the plate

(B) shear strength of the plate

(C) bearing stength of the concrete pedestal

(D) punching criteria

161. Which of the following clay minerals has the highest cation exchange capacity?

(A) Kaolinite (B) Smectite

(C) Illite (D) Chlorite

162. Flow net is graphical solution of which of the following equation?

(A) Laplace's equation

(B) Darcy-Weisbach equation

(C) Hagen-Poiseuille equation

(D) None of the above

163. Ordinary method of slices satisfies which equilibrium condition?

(A) Force equilibrium only (B) Moment equilibrium only

(C) Both force and moment equilibrium (D) None of these

164. The optimum lime content for stabilizing a problematic clayey soil is typically determined based on

(A) Eades and Grim pH test (B) Soil classification

(C) Plastic limit (D) Liquid limit

165. Effective particle size based on particle size distribution data is

(A) D_{50} (B) D_{10}

(C) D_{30} (D) D_{60}

166. For estimating primary consolidation of a NC clay slope, which of the following curves should be used?

(A) recompression curve
(B) virgin compression curve
(C) swelling curve
(D) none of the above

167. Darcy's law is assumed to be valid for flow of water through soil when Reynold's number is

(A) < 1400 (B) < 2000 (C) > 2000 (D) < 1

168. The soil fabric on the wet side of optimum is

(A) Dispersed
(B) Flocculated
(C) Can be either flocculated or dispersed
(D) None of the above

169. Kneading type compaction is most effective for

(A) SP (B) SW (C) CH (D) GW

170. The core cutter method for estimating in-situ soil density will not be suitable for which type of soil?

(A) Clayey soil
(B) Silty soil
(C) Clayey sand
(D) Clean sand

171. In a falling head permeability test, if t_1 time is needed for head of water to drop from h_1 to $\sqrt{(h_1 h_2)}$, then how much time is needed for head of water to drop from $\sqrt{(h_1 h_2)}$ to h_2?

(A) $2t_1$ (B) $\sqrt{t_1}$ (C) t_1^2 (D) t_1

172. If saturated unit weight of a sand deposit is 19.62 kN/m^3, then the critical hydraulic gradient is

(A) 1.1 (B) 1.2 (C) 1.0 (D) 0.9

173. If 0.1 m head loss takes place while water flows in upward direction through 1 m of the soil layer, then the seepage force per volume is

(A) 9.81 kN/m^3
(B) 0.981 kN/m^3
(C) 98.1 kN/m^3
(D) None of these

174. If a sand has C_c between 1 and 3, which of the following is required for it to be classified as SW?

(A) $C_u > 6$ (B) $C_u < 6$ (C) $C_u > 4$ (D) None of these

175. Constrained modulus of a soil can be estimated from

(A) Sieve analysis
(B) UCS test
(C) Consolidation test
(D) Compaction test

176. The field compression curve is predicted from the laboratory compression curve using

(A) Schmertmann's method
(B) Casagrande's method
(C) Terzaghi's method
(D) Atterberg's method

177. A 3 × 3 group pile having pile diameter of 500 mm passes through a 10 m thick saturated clay layer. The length of each pile is 9 m and c/c spacing is 0.25 m. Constrained modulus for the stress increase range is 10,000 kPa. If the magnitude of primary consolidation settlement of the pile group is 0.4 m, then the working load applied on the pile group is

(A) 6000 kN
(B) 9000 kN
(C) 5000 kN
(D) 4000 kN

178. The vibratory roller is most effective for compacting

(A) CH
(B) SW
(C) CL
(D) MH

179. The pore water pressure at a point on the phreatic surface is

(A) 0 kPa (absolute)
(B) 0 kPa (gauge)
(C) 100 kPa (gauge)
(D) –10 kPa (gauge)

180. Compression index is obtained from which compression curve?

(A) e-p′
(B) e-log p′
(C) ε-p′
(D) ε-log p′

181. For laterally loaded long pile, the ultimate load carrying capacity of the pile should be calculated considering

(A) shear failure of soil
(B) failure of the pile
(C) shear failure of the soil and failure of the pile
(D) none of the above

182. The point load carrying capacity of a 0.3 m diameter circular pile resting in a layer of saturated clay having undrained cohesion of 200 kPa is

(A) 162 kN
(B) 127.2 kN
(C) 95.2 kN
(D) None of these

183. The bearing capacity factors for estimation of short-term bearing capacity of shallow foundations resting on clay under undrained loading as per Terzaghi's theory is

(A) 5.7, 1, 0 (B) 5.14, 1, 0

(C) 5.14, 1, 1 (D) none of these

184. Increase in excess pore water pressure during shearing phase of CU test is expected to occur in

(A) Dense sand (B) OC clay

(C) Both dense sand and OC clay (D) NC clay

185. If superficial velocity of flow of water through a porous media is 0.01 cm/s and void ratio is 0.5, then the seepage velocity is

(A) 0.03 cm/s (B) 0.02 cm/s

(C) 0.01 cm/s (D) 0.005 cm/s

186. If a soil has 67% passing 75 micron sieve, LL of 20, PL of 15, then the soil will be classified as

(A) CH (B) CL

(C) CL-ML (D) None of these

187. Which of the soil classification symbols is invalid?

(A) SW-SM (B) CW (C) ML (D) SC-SM

188. A soil with LL of 50 will be classified as silt, if its PI is less than

(A) 14.6 (B) 21.9

(C) 16.6 (D) none of these

189. Which of the following methods satisfies both force and moment equilibrium?

(A) Ordinary method of slices (B) Bishop's simplified method of slices

(C) Morgenstern-Price method (D) None of these

190. For a shallow foundation resting on a sand layer having effective friction angle of 30°, the sides of the triangular zone immediately under the footing makes what angle with the base of the foundation as per Terzaghi's bearing capacity theory?

(A) 30° (B) 60°

(C) 45° (D) None of these

191. If an infinite slope in sand has slope angle of 35 degree and angle of internal friction is 32 degree, then the FOS against sliding is expected to be

(A) 1 (B) >1 (C) <1 (D) >2

192. For estimating negative skin friction on a pile, which of the following shear strength parameter is required?

(A) c' and ϕ' (B) c and ϕ

(C) c_u (D) unconfined compressive strength

193. For a rigid footing resting on clay, the contact pressure is

(A) constant along base of the footing

(B) higher at the edges and lower at the centre

(C) lower at the edges and higher at the centre

(D) none of the above

194. Estimation of immediate settlement of foundation based on theory of elasticity is most appropriate for footing resting on

(A) sand (B) gravel

(C) clay (D) none of these

195. A drained triaxial test was performed on a representative sand specimen with $\sigma_3' = 100$ kPa and $\sigma_1'/\sigma_3' = 3$ at failure. The effective friction angle is

(A) 34° (B) 35° (C) 30° (D) 27°

196. The critical slip circle in a slope of saturated clay will always be a toe circle if slope angle is

(A) > 53° (B) < 53° (C) > 30° (D) none of these

197. For a shallow foundation resting on sand, which of the following approaches should be adopted to predict the settlement of foundation?

(A) Janbu's method (B) Theory of elasticity

(C) Schmertmann's method (D) None of these

198. If the net safe bearing capacity of a footing is 350 kPa and safe bearing pressure is 400 kPa, then the allowable bearing capacity is

(A) 400 kPa (B) 350 kPa (C) 750 kPa (D) 375 kPa

199. Constant head permeability test is most suitable for which of the following type of soil?

(A) CH (B) CL (C) SC (D) SP

200. Dispersing agent correction in hydrometer analysis is always

(A) Positive (B) Negative

(C) Zero (D) Can be either positive or negative