OSSC JE
Mains
Previous Year Paper
(Civil)
16 Mar, 2025

1. A pitot tube is used to measure
   a) Pressure
   b) Difference in pressure
   c) Velocity
   d) Discharge

2. For subcritical flow in an open channel, the control section for gradually varied flow profile is:
   a) at the downstream end
   b) at the upstream end
   c) at both ends
   d) at any intermediate section

3. Which of the following earth moving machines has the shorter cycle time?
   a) Drag line
   b) Hoe
   c) Clam shell
   d) Dipper shovel

4. Prefabrication is a_____ construction method.
   a) automotive
   b) modern
   c) established
   d) industrialised

5. Which are the characteristics of Materials used for construction of PFs (Permanent Formworks)?
   a) thermal insulation property
   b) combustibility
   c) heavier materials
   d) none of the above

6. The oldest type of machine which removes earth is:
   a) Escalator
   b) Excavator
   c) Elevator
   d) Bulldozer

7. In which of the following types, does the entrepreneur work as a middle man?
   a) Joint
   b) Private
   c) Social
   d) Trading

8. A vertical photograph was taken at an altitude of 2000 m above MSL. If the focal length of the camera is 20 m, the scale of photograph for a terrain lying at an elevation of 1000 m is:
   a) 1:50
   b) 1:100
   c) 1:1000
   d) 1:25

9. Which apparatus is generally used to measure the soundness of the cement?
   a) Vicat Apparatus
   b) Le-Chatelier's apparatus
   c) Soundness meter
   d) Abrams apparatus

10. A portion of an embankment having a uniform up-gradient 1 in 500 is circular of radius 1000m of the centre line and subtends 180° at the centre. If the height of the bank is 1m at lower end, and side slopes 2:1, the earth work involved is:
   a) 5,000m^3
   b) 16,500 m^3
   c) 27,000 m^3
   d) 40,500 m^3

11. A cement concrete road is 1000m long, 8m wide and 15cm thick over the sub base of 10 cm thick gravel. The box cutting in road crust is:
   a) 500 m^3
   b) 1000 m^3
   c) 1500 m^3
   d) 2000 m^3

12. Berms are provided in canals if these are:
   a) Fully in excavation
   b) Partly in excavation and partly in embankment
   c) Fully in embankment
   d) All the above

13. If the formation level of a highway has a uniform gradient for a particular length, and the ground is also having a longitudinal slope, the earthwork may be calculated by
   a) Mid-section formula
   b) Trapezoidal formula
   c) Prismoidal formula
   d) All the above

14. A ratio of moment carrying capacity of a circular beam of diameter D and a square beam of size D is:

a) $\pi/4$
b) $3\pi/8$
c) $\pi/3$
d) $3\pi/16$

15. What is the ratio of maximum shear stress to average shear stress for a circular section?

a) 2
b) 2/3
c) 4/3
d) 3/4

16. The ratio of depth to width of a strongest beam that can be cut out of a cylindrical log of wood with homogeneous and isotropic properties is:

a) 1.414
b) 1.25
c) 0.707
d) 0.504

17. A uniform beam of span L is rigidly fixed at both supports. It carries a uniformly distributed load 'w' per unit length over full span. The bending moment at mid span is:

a) $wL^2 / 8$
b) $wL^2 / 12$
c) $wL^2 / 16$
d) $wL^2 / 24$

18. The degree of static indeterminacy (D_s) of a rigid jointed plane frame may be written as (where m = No. of members, j = No. of joints, r = No of reactions):

a) $D_s = (3m + r) - 3j$
b) $D_s = (3m - r) + 3j$
c) $D_s = (m + r) - 3j$
d) $D_s = (3m - r) + j$

19. A propped cantilever AB of length L is fixed at A and propped at B, subjected to uniformly distributed load ' w ' per unit length over its full span length. What is the reaction at propped end B?

a) 3wL/ 8
b) wL / 8
c) 5wL / 8
d) 7wL/12

20. Method of joints is applicable to calculate member forces of a truss , when the number of unknown forces at the joint under consideration is not more than

a) One
b) Two
c) Three
d) Four

21. What is the value of maximum shear force for a simply supported beam of length 6.0m, subjected to uniformly distributed load (w kN/m) through the span for which the B.M. equation at a section, from left support ,situated at 'X' m is $M_x = 30x - 0.5 (wx^2)$?

a) 30 kN
b) 40 kN
c) 50 kN
d) 60 kN

22. The hydraulic head that would produce a quick sand condition in sand stratum of thickness 1.5m, specific gravity 2.67 and void ratio 0.67is equal to

a) 1.0m
b) 1.50m
c) 2.0m
d) 3m

23 .The change that take place during the process of consolidation of a saturated clay would include:

a) An increase in pore water pressure and an increase in effective pressure
b) An increase in pore water pressure and a decrease in effective pressure
c) A decrease in pore water pressure and a decrease in effective pressure
d) A decrease in pore water pressure and an increase in effective pressure

24. A soil has bulk density 2.30 g/ cm^3 and water content 15% . The dry density of the sample is:

a) 1.0 g/ cm^3
b) 1.5 g/ cm^3
c) 2.0 g/ cm^3
d) 2.5 g/ cm^3

25. If the time required for 60% consolidation of a remolded soil sample of clay with single drainage is "T" , then what is the time required to consolidate

the sample of clay with the same degree of consolidation but with double drainage?

a) 4T
b) 2T
c) T/2
d) T/4

26. Minimum required water cement ratio for a workable concrete is:

a) 0.30
b) 0.40
c) 0.50
d) 0.60

27. The modulus of elasticity (E) of concrete is given by

a) $E = 1000\ f_{ck}$
b) $E = 5000\ \sqrt{f_{ck}}$
c) $E = 5500\sqrt{f_{ck}}$
d) $E = 1000\ \sqrt{f_{ck}}$

28. Dorry's testing machine is used for

a) Crushing test of stones
b) Hardness test of stone
c) Impact test of stone
d) Water absorption test

29. Enamel paint is made by adding

a) White paint in varnish
b) Bitumen in varnish
c) White lead in lacquer
d) Zinc white in spirit

30. In long wall and short wall method of estimation which one of the following is correct?

a) Short wall length in-to-in = centre to centre length – one breadth
b) Short wall length in-to-in = centre to centre length + one breadth
c) Long wall length out-to-out = centre to centre length + one breadth
d) Long wall length out-to-out = centre to centre length - two breadth

31. Mobilization advance up to 10% of the cost of work is given to contractor

a) For all activities required to start the work at site on finalization of contract
b) Shifting electricity poles and cleaning of site only
c) For procuring materials
d) To construct site office

32. PWD initiates a construction work after

a) Technical approval for the work
b) Administrative approval for the work
c) Once Preliminary estimate is made
d) Correctly accessing the probable addition and alteration of the work

33. When Environmental Lapse Rate (ELR) is more than Adiabatic Lapse Rate (ALR), then the environment is said to be

a) Stable
b) Unstable
c) Neutral
d) None of the above

34. The chlorine demand of a water sample was found to be 0.2mg / liter. The amount of bleaching powder containing 30% available chlorine to be added to treat one liter of such water sample is:

a) 0. 67 mg
b) 0.06 mg
c) 1.33 mg
d) 0.14 mg

35. Turbidity is measured on

a) Standard silica scale
b) Standard cobalt scale
c) Standard platinum scale
d) Platinum cobalt scale

36. Minimum clear cover(in mm) to the main steel bar in footing, column, beam and slab are respectively:

a) 75,40,25,15
b) 40,75,15,25
c) 30,20,25,15
d) 50,40,25,20

37. Minimum percentage of high yield deformed bars in a R.C. slab compared with gross concrete area is:

a) 0.40
b) 0.15
c) 0.12
d) 0.10

38. What is value of flexural tensile strength of M25 concrete?

a) 4.0 M Pa

b) 3.5 MPa
c) 3.0M Pa
d) 1.75 M Pa

39. Which of the following motivators is the most basic need in Maslow's hierarchy?
a) Safety
b) Belonging
c) Esteem
d) Physiological

40. Which "Pillar of TQM" recognizes that product quality is a result of process quality?
a) Customer focus
b) Process Management
c) Employee empowerment
d) Continuous improvement

41. As per IS : 800, the maximum bending moment for design of purlins can be taken as (Where W is total distributed load including the wind load on the purlins and L is center distance of support):
a) WL/6
b) WL/8
c) WL/10
d) WL/12

42. A butt weld is specified by
a) Effective throat thickness
b) Plate thickness
c) Size of weld
d) Penetration thickness

43. In a tension member if one or more than one rivet holes are off the line, the failure of the member depends on
a) Pitch
b) Gauge
c) Diameter of the rivet holes
d) All of the above

44. An object weights 289.2N in air and 186.9N in water. What is relative density of the material of the object?
a) 2.83
b) 2.45
c) 2.15
d) 3.15

45. What is the moisture depth available for evapotranspiration in root zone of 1 m depth soil, if dry weight of soil is 1.5gm / cc, field capacity is 30% and permanent wilting point is 10%?
a) 450 mm
b) 300mm
c) 200 mm
d) 150 mm

46. In a river, silt excluder and silt ejector are constructed
a) At a location after the head regulator and at the head of the canal, respectively
b) At the head of the canal, and at a location after the head regulator , respectively
c) At the same location
d) At specific locations depending upon diverse factors and their locations do not follow a set pattern

47. The plan of a map was photo copied to a reduced size such that a line originally 100 mm measures 90mm. The original scale of the plan was 1:1000. The revised scale is:
a) 1:900
b) 1:1111
c) 1:1121
d) 1:1221

48. The bearings of lines OA and OB are 16^0 10' and 332^0 18', the value of the included angle BOA is:
a) 316^0 10'
b) 158^0 28'
c) 348^0 08'
d) 43^0 52'

49. The highway capacity is expressed in Passenger Car Unit(PCU). According to IRC, for a passenger car, the PCU is:
a) 1
b) 2
c) 3
d) 4

50. The rise of water level above its normal level when passing under bridge is called
a) Afflux
b) Free board
c) Headroom
d) Tailroom

51. Which of the following is NOT TRUE about plane table surveying?
    a) It is a rapid method of surveying.
    b) It is a precise method of surveying.
    c) It is a cost-effective method of surveying.
    d) It is a versatile method of surveying.

52. In an adjustable level, when the bubble is at centre, the axis of the bubble tube becomes parallel to
    a) Line of sight
    b) Line of collimation
    c) Axis of telescope
    d) None of these

53. In a straight line, two lengths A and B are measured from a point P. The standard errors of measured lengths A and B are found to be 0.4m and 0.3m. The standard error in the length A minus B is:
    a) 0.7 m
    b) 0.35 m
    c) 0.5 m
    d) 0.1 m

54. Which one of the following is correct for Prismatic Compass?
    a) The graduated ring rotates with line of sight.
    b) Instrument cannot be used without tripod.
    c) The graduations are engraved inverted.
    d) The readings can directly be taken by seeing through the top of the glass.

55. Which one of the following methods estimates the best area of an irregular and curved boundary?
    a) Trapezoidal method.
    b) Simpson's method.
    c) Average ordinate method.
    d) Mid-ordinate method

56. An image of the top of the hill is 92 mm from the principal point of the photograph. The elevation of the top of the hill is 400 m and the flying height is 4000 m above the datum. The relief displacement will be
    a) 9.2 mm
    b) 12 mm
    c) 88mm
    d) 8 mm

57. To uniquely determine the position of the user using GPS, one needs to receive signals from at least
    a) 1 satellite
    b) 2 satellites
    c) 3 satellites
    d) 4 satellites

58. The time by which activity completion time can be delayed without affecting the start of succeeding activities is known as:
    a) Total Float
    b) Free Float
    c) Interfering Float
    d) Zero Float

59. What is the angle between principal strain axis and maximum shear strain axis?
    a) 0°
    b) 30°
    c) 45°
    d) 90°

60. A Mohr circle reduces to a point when the body is subjected to
    a) Pure shear
    b) Uniaxial stress only
    c) Equal and opposite axial stresses on two mutually perpendicular planes, the planes being free of shear
    d) Equal axial stresses on two mutually perpendicular planes, the planes being free of shear

61. A steel column is pinned at both ends and has a buckling load of 250 kN. If the column is restrained against lateral movement at its mid-height, its buckling load will be
    a) 200 kN

b) 800 kN
c) 1000 kN
d) 1200 kN

62. The constituent compound in Portland cement which reacts immediately with water, and also sets earliest, is:
a) Tricalcium Silicate
b) Dicalcium Silicate
c) Tricalcium Aluminate
d) Tetracalcium Alumino ferrite

63. Which one of the following stone is produced by moulding a mixture of iron slag and Portland cement?
a) Imperial stone
b) Garlic stone
c) Ransom stone
d) Victoria stone

64. As per IS 456:2000, the maximum admissible water-cement ratio for mild environmental exposure for concrete should be
a) 0.55
b) 0.50
c) 0.45
d) 0.45

65. The method used for estimation of depreciation of building is known as:
a) Logistic curve method
b) Rental method
c) Constant percentage method
d) Direct comparison method

66. Due to a change in price level, a revised estimate is prepared if the sanctioned estimate exceeds
a) 2.0%
b) 2.5%
c) 4.0%
d) 5.0%

67. A wall of 12m in length having a height of 2m is to be plastered. If the thickness of the wall is 85 cm, the quantity of plastering in (sq. m) required is in the range
a) 45 to 65
b) 20 to 40
c) 65 to 85
d) 1 to 20

68. Number of bricks (having size of 20 cm x 10 cm x 10 cm) required for 17 cu.m of brickwork is approximately
a) 6750
b) 7200
c) 7500
d) 8500

69. The plinth area of a building does not include area of
a) the walls at the floor levels.
b) internal shaft for sanitary installations up to 2 m^2 area.
c) lifts
d) cantilevered porches

70. Water charge are usually taken as _____ % for rate analysis of an item
a) 3
b) 1
c) 1.5
d) 5

71. A T-beam behaves as a rectangular beam of width equal to its flange if its neutral axis
a) Coincides with centroid of reinforcement
b) Coincides with centroid of T-section
c) Remains within the flange
d) Remains in the web

72. Which of these methods is the most appropriate method used in site to determine a soil's water content?
a) Pycnometer method
b) Oven drying method
c) Calcium carbide method
d) Sand bath method

73. When the sand in-situ happens to be in its densest state, then the sand's relative density would be:

a) Greater than 1
b) Between 0 & 1
c) 1
d) None of these

74. _____ is the measure of loss of strength with remoulding, with water content unchanged.

a) Compressibility
b) Sensitivity
c) Stability
d) Thixotropy

75. Triaxial compression test is used to find _____ of soil.
a) Compressive strength
b) Permeability
c) Specific gravity
d) Shear strength

76. A deposit of fine sand has a porosity n and specific gravity of soil solids is G. The hydraulic gradient of the deposit to develop boiling condition of sand is given by:
a) $(G\text{-}1)\,(1\text{-}n)$
b) $(G\text{-}1)\,(1+n)$
c) $(G\text{-}1)/(1\text{-}n)$
d) $(G\text{-}1)/(1+n)$

77. A normally consolidated undisturbed clay is having a liquid limit of 58%. What is the compression index (C_c) of this clay?
a) 0.531
b) 0.652
c) 0.432
d) 0.622

78. Which one of the following is a secondary pollutant?

a) Carbon Monoxide
b) Hydrocarbon
c) Ozone
d) Volatile Organic Carbon (VOC)

79. Which of these layers of the atmosphere consists of the ozone layer that is responsible for absorbing the Ultra-Violet (UV) light?

a) Troposphere
b) Mesosphere
c) Stratosphere
d) None of these

80. Which of these elements is present in the drinking water that can lead to numerous fatal diseases?

a) Phosphorus
b) Calcium
c) Arsenic
d) None of the above

81. One litre of sewage, when allowed to settle for 30 minutes gives a sludge volume of 27 cm^3. If the dry weight of this sludge is 3.0 grams, then its sludge volume index (SVI) in ml/grams will be:

a) 9
b) 24
c) 30
d) 81

82. Activated sludge process is an example of _____.
a) Anaerobic suspended growth process
b) Anaerobic attached growth process
c) Aerobic attached growth process
d) Aerobic suspended growth process

83. The purpose of a water storage tank in a distribution system is to:
a) Regulate water pressure
b) Store water for emergencies
c) Maintain a constant supply of water
d) All of the above

84. Which of the following represents the heavier inert matter in wastewater?
a) Screens
b) Grit
c) Debris
d) Waste

85. In the design of a steel beam using an I-section:
a) Shear capacity of flanges is neglected
b) Shear capacity of the web is neglected
c) Shear capacity of both flange and web is neglected
d) None of the above

86. Which of the following is the most common type of failure in a slender steel structure?
a) Brittle fracture
b) Fatigue
c) Buckling
d) Yielding

87. As per IRC 96, 1983, the recommended carriageway width for a two lane road with kerbs is:
a) 7.0 m
b) 7.5 m
c) 8.0 m
d) 8.5 m

88. A bitumen sample has been graded as VG30 as per IS: 73-2013. The '30' in the grade means that
a) Penetration of bitumen at 25^0C is between 20 and 40
b) Viscosity of bitumen at 60^0C is between 2400 and 3600 Poise
c) Ductility of bitumen at 27^0C is more than 30 cm
d) Elastic recovery of bitumen at 15^0C is more than 30%

89. A car is moving at a speed of 90kmph on a road having a 2% upward gradient. The driver applies brakes when he sees an obstruction. If his reaction time is 1.5 seconds, assuming that the coefficient of friction between pavement and tyre is 0.15, calculate the distance traversed before the car finally stops (round to an integer value).
a) 200 m
b) 225 m
c) 1056 m
d) 150 m

90. Which one of the following is used for drainage purpose in pavement design?
a) Kerb
b) Shoulder
c) Camber
d) All of the above

91. In highway pavements emulsions are mainly used in
a) Surface dressing
b) Patching and maintenance
c) Bitumen macadam
d) Asphaltic concrete

92. Alligator or map cracking is the common type of failure in
a) Concrete pavements
b) Bituminous surfacing
c) Gravel roads
d) WBM construction

93. What is curve resistance for a 50 tonnes train on a BG on a 4° curve?
a) 0.05 tonne
b) 0.06 tonne
c) 0.08 tonne
d) 0.10 tonne

94. Which one of the following types of transition curves is mostly used in Indian Railways?
a) Euler's spiral
b) Cubic Spiral
c) Lemniscate
d) Cubic Parabola

95. Which of the following are related to maintenance of railway track?

1. Jim crow and gauge bar

2. Through packing and boxing

3. Buffer stop and sand hump

4. Creep adjustment

Select the correct answer using the codes given below:

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

96. Height of the bridge is kept____ above high flood level.
a) 1.2 to 1.5 m
b) 1.8 to 2.1m
c) 2.2 to 2.5m
d) More than 2.5

97. Sub structure of a bridge does not include
a) Abutment
b) Girder/Slab
c) Piers
d) Wing and Return

98. As compared to laminar flow, the boundary layer in a turbulent flow will be
a) Same
b) Thicker
c) Thinner
d) Cannot say

99. Groynes are adopted for river bank protection works. When it is placed inclined in the downstream in the direction of flow in the river, it is designated as which one of the following?

a) Repelling groyne
b) Attracting groyne
c) Neither repelling nor attracting groyne
d) Fixed groyne

100. By providing a top width for roadway and freeboard in the elementary profile of a gravity dam, the resultant force for full reservoir condition will

a) shift towards the heel
b) shift towards the toe
c) not shift at all
d) None of the above