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WBPSC
JE (Civil)

Previous Year Paper
30 July 2023

1. Hydrostatic pressure on a dam depends upon its

(A) Length

(B) Breadth

(C) Depth

(D) All of the above

2. Pick up the item of work not included in the plinth area estimate

(A) Wall thickness

(B) Verandah area

(C) W.C. area

(D) Courtyard area

3. Closed contours with lower value inside represents a

(A) Depression

(B) Hill

(C) Plain surface

(D) None of the above

4. The amount of oxygen consumed by the aerobic bacteria which cause the aerobic biological decomposition of sewage, is known as

(A) Bio-Chemical Oxygen Demand (B.C.O.D.)

(B) Dissolved Oxygen (D.O.)

(C) Chemical Oxygen Demand (C.O.D.)

(D) None of the above

5. Vicat's apparatus is used to determine which of the following properties of cement?

(I) Normal consistency

(II) Initial setting time

(III) Final setting time

(IV) Fineness

The correct answer is

(A) (I) and (III)

(B) (II) and (IV)

(C) (I) and (IV)

(D) (I), (II) and (III)

6. The artificial seasoning method that causes timber to become brittle and easy to break is

(A) Chemical seasoning

(B) Boiling

(C) Electrical seasoning

(D) Kiln seasoning

7. The void ratio of a fully saturated soil sample having a porosity of 0.3 is

(A) 1.0

(B) 0.43

(C) 0.56

(D) 0.24

8. In a roof truss, which of the following is used to support roofing material?

(A) Tie beam

(B) Base plate

(C) Purlins

(D) Gusset plate

9. The diameter of a rivet hole is made larger than the diameter of rivet by 2 mm for rivet diameters

(A) up to 12 mm

(B) up to 22 mm

(C) up to 15 mm

(D) exceeding 25 mm

10. For construction of structures under water, the type of lime used is

(A) hydraulic lime

(B) fat lime

(C) quick lime

(D) pure lime

11. Which among the following is temporary dam constructed for facilitating construction works?

(A) Buttress dam

(B) Detention dam

(C) Coffer dam

(D) Debris dam

12. Which among the following is not a road junction at the same elevation?

(A) Diamond interchange

(B) Unchannelized intersection

(C) Channelized intersection

(D) Round about

13. Which of the following methods of irrigation do not use open ditches for water delivery?

(A) Sub-irrigation

(B) Trickle irrigation

(C) Furrow irrigation

(D) Check irrigation

14. For a vehicle negotiating a curve, centrifugal force P, is

(I) directly proportional to weight of vehicle.

(II) inversely proportional to square of velocity.

(III) inversely proportional to radius of curve.

Which of the above statements are true?

(A) (I) and (II)

(B) (II) and (III)

(C) (I) and (III)

(D) (I), (II) and (III)

15. Lime stabilization is very effective in treating

(A) Sandy soil

(B) Silty soil

(C) Non-plastic soil

(D) Plastic clayey soil

16. The Indian Standard Code used for wind load analysis is

(A) IS 456

(B) IS 800

(C) IS 875

(D) IS 1893

17. Which among the following is a compression of soil mass resulting from a long term static load and consequent escape of pore water?

(A) Compaction

(B) Consolidation

(C) Sedimentation

(D) Thixotropy

18. The type of foundation generally suitable for buildings on liquefiable soil deposit is

(A) Well foundation

(B) Raft foundation

(C) Spread footing

(D) Pile foundation

19. In a cantilever beam tensile reinforcement is provided

(A) on the top of the beam.

(B) on the bottom of the beam.

(C) in the middle of the beam.

(D) on the top and bottom of the beam.

20. For carrying out bituminous patch work during the rainy season the most suitable binder is

(A) hot bitumen

(B) cutback bitumen

(C) road tar

(D) bituminous emulsion

Please Turn Over

21. The commonly used lime in white washing is

(A) Hydraulic Lime
(B) Fat Lime
(C) Plain Lime
(D) Quick Lime

22. A rectangular channel section will be most efficient when

(A) hydraulic radius is equal to half the depth of flow.
(B) hydraulic radius is equal to the depth of flow.
(C) depth of flow is equal to the bottom width.
(D) depth of flow is equal to half the hydraulic radius.

23. Negative skin friction on piles

(A) is caused due to relative settlement of the soil.
(B) is caused in soft clays.
(C) decreases the pile capacity.
(D) All of the above

24. The standard size of brick as per IS standard is

(A) $20 \times 10 \times 10$ cm
(B) $23 \times 12 \times 8$ cm
(C) $19 \times 9 \times 9$ cm
(D) $18 \times 9 \times 9$ cm

25. Which of the following sewers is preferred for combined system of sewage?

(A) Circular sewer
(B) Egg shaped sewer
(C) Rectangular sewer
(D) Square sewer

26. What is the angle between two plane mirrors of an optical square?

(A) $60°$
(B) $45°$
(C) $90°$
(D) $30°$

27. Alum when added as a coagulant in water for flocculation

(A) does not require alkalinity in water.
(B) does not affect pH value of water.
(C) increases pH value of water.
(D) decreases pH value of water.

28. Cost of a property minus the accumulated depreciation is known as

(A) Scrap value
(B) Salvation value
(C) Junk value
(D) Book value

29. The water of zero hardness can be achieved by

(A) Lime process
(B) Lime soda process
(C) Zeolite process
(D) Adsorption

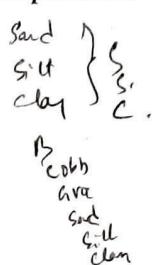30. Inclination of the compass needle to the horizontal towards the pole is called

(A) Dip
(B) Declination
(C) Azimuth
(D) Bearing

31. Accurate determination of water content for a soil sample, is done by
   (A) Sand bath method
   (B) Calcium Carbide method
   (C) Oven-drying method
   (D) Alcohol method

32. Soil which contains finest grain particles
   (A) Coarse Sand
   (B) Fine Sand
   (C) Silt
   (D) Clay

33. Which among the following is responsible for 'quick sand'?
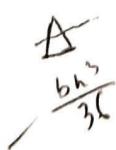   (A) Effective overburden pressure
   (B) Shear strength of soil particles
   (C) Seepage pressure
   (D) Cohesion between soil particles

34. Inadequate compaction during concrete casting results in
   (A) Segregation
   (B) Honey combing
   (C) Bleeding and Segregation
   (D) Bleeding

35. Moment of intertia of a triangular section of base (b) and height (h) about an axis passing through its C.G. and parallel to the base, is
   (A) $bh^3/4$
   (B) $bh^3/8$
   (C) $bh^3/12$
   (D) $bh^3/36$

36. The set of forces, whose resultant is zero are known as
   (A) Equilibrium forces
   (B) Collinear forces
   (C) Coplanar forces
   (D) Concurrent forces

37. Darcy's law is applicable to seepage if a soil is
   (A) Incompressible
   (B) Isotropic
   (C) Homogeneous
   (D) All of the above

38. Density index for a natural soil is used to express
   (A) percentage voids
   (B) relative compactness
   (C) shear strength of clays
   (D) specific gravity

39. Side face reinforcement is required when the depth of beam is
   (A) greater than 750 mm.
   (B) greater than 1000 mm.
   (C) greater than 300 mm.
   (D) greater than 500 mm.

40. A good brick when immersed in water bath for hours, should not observe
   (A) 20% of its saturated weight
   (B) 30% of its weight
   (C) 10% of its saturated weight
   (D) 15% of its saturated weight

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41. The minimum water content at which the soil just begins to crumble when rolled into threads 3 mm in diameter, is known as

(A) Liquid limit
(B) Plastic limit
(C) Shrinkage limit
(D) None of the above

42. The maximum diameter of the reinforcement bars in R.C.C. slabs is recommended in code as

(A) 16 mm
(B) Span/100
(C) Thickness of slab/8
(D) All of the above

43. The time of setting of cement paste depends on

(A) temperature at which cement paste is allowed to set.
(B) percentage of water mixed to cement in making paste.
(C) humidity at which setting is allowed.
(D) All of the above

44. The slope of curve of S.F.D. (Shear Force Diagram) at any section will be equal to

(A) the slope of loading at the section.
(B) the ordinate of loading diagram at the section.
(C) the slope of B.M.D. (Bending Moment Diagram) at the section.
(D) the ordinate of B.M.D. (Bending Moment Diagram) at the section.

45. In levelling between two points A and B on opposite banks of a river, the level was set up near A and the staff readings on A and B were 1.30m and 2.60m respectively. The level was then moved and set up near B and the respective readings on A and B were 0.80m and 2.40m. What is true difference (in m) of levels between A and B?

(A) 1.72
(B) 1.45
(C) 2.58
(D) 2.86

46. In a plate girder design, the rivets connecting the flange angles and the flange plates have to be designed for

(A) Bending Stress
(B) Single Shear
(C) Double Shear
(D) Bending and Shear

47. The thickness of the gusset plate attached to a tension member as per code, shouldn't be less than

(A) 6 mm
(B) 8 mm
(C) 12 mm
(D) 16 mm

48. Efflorescence of bricks is due to

(A) soluble salts present in clay for making bricks.
(B) high porosity of bricks.
(C) high silt content in the soil used.
(D) excessive burning of bricks.

49. Under-reamed piles are generally

(A) Driven Pile
(B) Bored Pile
(C) Precast Pile
(D) Sheet Pile

50. The 'surcharge storage' in a dam reservoir is the volume of water stored between

(A) minimum and maximum reservoir levels.

(B) minimum and normal reservoir levels.

(C) normal and maximum reservoir levels.

(D) None of the above

51. The quantity of seepage of water through soils is proportional to—

I. Coefficient of permeability of soil

II. Total head loss through the soil

(A) Only I

(B) Only II

(C) Both I & II

(D) Neither I nor II

52. For long columns, the value of buckling load is _____ crushing load.

(A) equal to

(B) less than

(C) more than

(D) None of the above

53. The compressive strength of 100 mm cube is compared to 150 mm cube is always

(A) more

(B) less

(C) same

(D) unpredictable

54. Normally the Mastic Asphalt is used for

(A) Fire proofing

(B) Sound insulation

(C) Water proofing

(D) None of the above

55. While aligning a hill road with a ruling gradient of 5%, a horizontal curve of 75m radius is encountered. The compensated gradient at the curve will be

(A) 3.6

(B) 3.8

(C) 4.0

(D) 4.2

56. Alligator or map cracking is the common type of failure in

(A) Bituminous surfacing

(B) Water Bound Macadam (WBM)

(C) Concrete pavements

(D) Gravel Roads

57. In a single reinforced beam, if the permissible stress in concrete reaches earlier than that in steel, the beam section is called

(A) Under-reinforced section

(B) Over reinforced section

(C) Balanced section

(D) Critical section

58. The minimum percentage of tensile reinforcement in R.C.C. beams is

(A) $0.85/f_y$

(B) 0.4

(C) 0.15 bD

(D) 0.18 bD

59. Fly ash is a residual product emitted from

(A) Mining Industries

(B) Hydel Power Plant

(C) Nuclear Power Plants

(D) Thermal Power Plants

Please Turn Over

60. Per capita consumption is highest in
    (A) Schools
    (B) Hospitals
    (C) Offices
    (D) Factories

61. The slope of the bending moment diagram of any section of a loaded beam is
    (A) torsion at the section.
    (B) maximum shear force of the beam.
    (C) shear force at that section.
    (D) maximum bending moment of the beam.

62. The yield stress of a bolt of grade 4.6 is
    (A) 400 Mpa
    (B) 600 Mpa
    (C) 420 Mpa
    (D) 240 Mpa

63. The Damp Proof Course (D.P.C.) is measured in
    (A) Cub.m
    (B) Sq.m
    (C) Metres
    (D) None of the above

64. As per IS:456-2000, the modulus of elasticity of concrete is taken as
    (A) 5700 √fck
    (B) 5000 √fck
    (C) 570 √fck
    (D) 50 √fck

65. Weir may be used to measure
    (A) Velocity of flow
    (B) Pressure
    (C) Discharge in a river or channel
    (D) Kinetic energy

66. If the smallest division of a Vernier is longer than the smallest division of its primary scale, the Vernier is known as
    (A) Direct Vernier
    (B) Double Vernier
    (C) Simple Vernier
    (D) Retrograde Vernier

67. Canal normally used for diversion of flood water of a river is
    (A) Feeder canal
    (B) Inundation canal
    (C) Ridge canal
    (D) Contour canal

68. The ultimate bearing capacity of a soil is
    (A) load at which soil consolidates.
    (B) total load on the bearing area.
    (C) safe load on the bearing area.
    (D) load at which soil fails.

69. When a canal is carried over a natural drainage, the structure provided, is known as
    (A) Syphon
    (B) Aqueduct
    (C) Super passage
    (D) Syphon-aqueduct

70. The main principle of surveying is to work
    (A) from part to the whole.
    (B) from whole to the part.
    (C) from higher level to the lower level.
    (D) location of a point by measurement from at least three points of reference

71. Σ (curing period × temperature) is known as

(A) Curing
(B) Shrinkage
(C) Maturity
(D) Shuttering period

72. In mass concreting, the type of cement which is normally be used is

(A) Ordinary Portland cement
(B) Portland Slag cement
(C) Low Heat cement
(D) Portland Pozzolana cement

73. The slenderness ratio is the ratio of

(A) area of column to least radius of gyration.
(B) effective length of column to least radius of gyration.
(C) least radius of gyration to area of column.
(D) least radius of gyration to length of column.

74. What is the portion of a brick obtained by cutting the brick longitudinally into two equal parts?

(A) King Closer
(B) Queen Closer
(C) Half bat
(D) Bewelled closer

75. In open channel water flows under

(A) force of gravity
(B) normal pressure
(C) hydrostatic pressure
(D) mechanical pressure

76. While submitting a tender the contractor is required to deposit some amount with the department, as guarantee of the tender known as

(A) Bank guarantee
(B) Caution money
(C) Security deposit
(D) Earnest money

77. For design of slabs, IS456 specifies effective span to overall depth ratios, this is to safeguard mainly

(A) Strength criterion
(B) Deflection criterion
(C) Crack widths
(D) Temperature stresses

78. Garbage is a

(A) Decomposable waste
(B) Semi-liquid waste
(C) Liquid waste
(D) Inert debris

79. Rainfall hydrograph shows the variation of

(A) cumulative rainfall with time.
(B) rainfall intensity with time.
(C) rainfall depth over an area.
(D) rainfall intensity with the cumulative rainfall.

80. If, Coefficient of variation of the rainfall values of the existing rain gauge stations is 30 and desired degree of percentage error in the estimate of the basin mean rainfall is 10%. Then the optimum number of rain gauge stations in that basin is
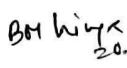
(A) 3
(B) 5
(C) 9
(D) 25

Please Turn Over

81. The variation of the bending moment in the segment of a beam where the load is uniformly varying is

    (A) Zero
    (B) Linear
    (C) Parabolic
    (D) Cubic parabola

82. The bending moment about the hinge support must be

    (A) less than zero
    (B) equal to zero
    (C) greater than zero
    (D) Approximately zero

83. When two plates are placed end to end and are joined by two cover plates, the joint is known as

    (A) Lap joint
    (B) Butt joint
    (C) Chain riveted lap joint
    (D) Double cover butt joint

84. When a doubly reinforced beam is preferred?

    (A) When depth of beam is more.
    (B) When depth of beam is to be limited for architectural reason.
    (C) When width of beam is to be limited.
    (D) When the ultimate moment of resistance is less than that of singly reinforced beam.

85. Plaster of Paris is obtained by calcinations of

    (A) Gypsum
    (B) Kankar
    (C) Lime stone
    (D) Sand stone

86. The density of steel used in the structural members should be

    (A) 1 gm/mm^3
    (B) 6.4 gm/mm^3
    (C) 7.85 gm/mm^3
    (D) 13.6 gm/mm^3

87. In long and short wall method of estimation, the length of long wall is the centre to centre distance between the walls and

    (A) breadth of the wall.
    (B) half breadth of wall on each side.
    (C) one fourth breadth of wall on each side.
    (D) None of the above

88. A beam strongest in flexure is one which has

    (A) maximum section modulus.
    (B) maximum bending stress.
    (C) maximum moment of inertia.
    (D) minimum value of radius of gyration.

89. In case of open channel flow, for calculating the specific energy what will be taken as datum?

    (A) Static Energy Line
    (B) Kinetic Energy Line
    (C) Bottom of channel
    (D) Horizontal line passing through level of critical depth

90. If, length of chain is shorter than the standard, then—

    (A) Positive Error and Positive Correction
    (B) Positive Error and Negative Correction
    (C) Negative Error and Positive Correction
    (D) Negative Error and Negative Correction

91. The most widely used tube-well in India is
   (A) Strainer well
   (B) Cavity well
   (C) Slotted well
   (D) Perforated well

92. A slab supported along two sides is called
   (A) Overhanging slab
   (B) Two way slab
   (C) One way slab
   (D) Cantilever slab

93. What is the average rate of loss such that the volume of rainfall in excess of that rate will be equal to direct run-off?
   (A) Run-off coefficient
   (B) Infiltration index
   (C) Infiltration capacity
   (D) Surface retention

94. The position of base course in a flexible pavement is
   (A) below the sub-base.
   (B) over the sub-base.
   (C) over the sub-grade but below sub-base.
   (D) over the wearing course when renewal of surface is needed.

95. The water of a river has an important property called
   (A) Turbidity
   (B) Self purification
   (C) Permeability
   (D) Infiltration capacity

96. For testing compressive strength of hydraulic cement other than masonry cement as per IS 4031 – Part 6, the size of cube used is
   (A) 50 mm
   (B) 70.6 mm
   (C) 150 mm
   (D) 100 mm

97. Windows that are hinged at ends and may swing out or in like doors are called
   (A) Folding window
   (B) Casement window
   (C) Pivoted window
   (D) Double hung window

98. Sieving is not practicable for grain size smaller than about
   (A) 75 μ
   (B) 90 μ
   (C) 120 μ
   (D) 150 μ

99. For no tension to develop in the gravity dam the resultant of all the external forces should always lie
   (A) within the u/s third portion.
   (B) within the d/s third portion.
   (C) within the middle third portion of the base.
   (D) at the centre of the base.

100. The following is a tensile test of concrete:
   (A) Compacting factor test
   (B) Non-destructive test
   (C) Cube compressive strength test
   (D) Splitting test