Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Closed contours of decreasing values towards their centre means :
   (A) a level road
   (B) a cliff
   (C) a depression
   (D) a hill

2. Coning of wheels in locomotives to :
   (A) prevent lateral movement of wheels
   (B) provide smooth running trains
   (C) avoid excessive wear of inner faces of rail
   (D) all the above

3. The earth's water circulatory system is known as :
   (A) Monsoon cycle
   (B) Hydrological cycle
   (C) Water cycle
   (D) None of the above

4. If the porosity of a soil sample is 20% the void ratio is :
   (A) 1.0
   (B) 0.8
   (C) 0.20
   (D) 0.25

5. Point of contra flexure is the point where :
   (A) shear force is zero
   (B) bending moment is maximum
   (C) couple is maximum
   (D) bending moment changes its sign

6. Carriage way width for single lane traffic is :
   (A) 3.75 M
   (B) 6.00 M
   (C) 3.25 M
   (D) 4.25 M

7. The characteristic compressive strength of M30 concrete is :
   (A) $28\,N/mm^2$
   (B) $28.77\,N/mm^2$
   (C) $20\,N/mm^2$
   (D) $30\,N/mm^2$

8. Bourdon tube gauge is used to measure :
   (A) potential difference of an electric circuit
   (B) discharge velocity
   (C) consolidation pressure
   (D) medium and high pressures of water

9. For laying or paving 400 sq.m area by using 20 cm × 20 cm size paving tiles, the number of tiles required will be :

(A) 10000 (B) 1000

(C) 400 (D) 4000

10. The weight per metre length of 20 mm diameter miled steel bar is approximately equal to :

(A) 2 times the weight per metre length of 12 mm dia-miled steel bars

(B) 2 times the weight per metre length of 10 mm dia-miled steel bars

(C) 4 times the weight per metre length of 10 mm dia-miled steel bars

(D) 4 times the weight per metre length of 12 mm dia-miled steel bars

11. Plate girders are usually used :

(A) as a tie member in a steel truss of small span

(B) over very small openings in residential buildings

(C) for railway bridges

(D) as a fish plate

12. The height of a wash basin above floor level is :

(A) 600 to 650 mm (B) 900 to 950 mm

(C) 750 to 800 mm (D) 1000 to 1200 mm

13. The most reliable estimate is :

(A) rough cost estimate (B) preliminary estimate

(C) plinth area estimate (D) detailed estimate

14. As per standards in India, water required per head per day for domestic purpose is :

(A) 80 litres (B) 105 litres

(C) 220 litres (D) 135 litres

15. Vicat's apparatus is generally used to measure :

(A) conductivity of water (B) consistency of cement

(C) shear strength of soil (D) soundness of cement

16. The grade of concrete which is not recommended for reinforced concrete work is :

(A) M30 (B) M25

(C) M10 (D) M20

17. The standard size of first class wire cut brick is :

(A) 19 cm × 9 cm × 9 cm
(B) 21.5 cm × 11.4 cm × 7.3 cm
(C) 20 cm × 10 cm × 10 cm
(D) 20 cm × 10 cm × 5 cm

18. Differential manometer is used to measure :

(A) very low pressure
(B) difference in pressure at two points
(C) atmospheric pressure
(D) none of the above

19. The test strength of concrete cubes obtained as samples from a major concrete work is the average strength of :

(A) 16 specimen cubes
(B) 3 specimen cubes
(C) 4 specimen cubes
(D) 28 specimen cubes

20. Cause ways are defined as :

(A) a raised roadway crossing water or marshy land
(B) a small opening in a canal to control the flow of water
(C) a type of flow through an open channel
(D) none of the above

21. Temporary hardness is caused by the presence of :

(A) Nitrates of Ca and Mg
(B) Sulphates of Ca and Mg
(C) Bi-Carbonates of Ca and Mg
(D) Chlorides of Ca and Mg

22. The rectangular moment of inertia of a circular section of diameter D about it's own centroidal axis is :

(A) $\frac{\pi}{4}D$
(B) $\frac{\pi D^3}{32}$
(C) $\frac{\pi}{16}D^2$
(D) $\frac{\pi D^4}{64}$

23. Hydrographic survey deals with the mapping of :

(A) large water bodies
(B) mountaineous region
(C) movement of clouds
(D) heavenly bodies

24. Steel structures are ideally suitable for impact loads because they have :

(A) plastic modulus
(B) design stress
(C) ductility
(D) toughness value

25. The tapered movable rail, connected at its thickest end to running rail is called :

(A) guard rail
(B) tongue rail
(C) stock rail
(D) leader rail

26. The whole circle bearing of a line is 300 degrees it's reduced bearing is :

(A) N 30°E (B) N 30°W

(C) N 60°W (D) S 60°E

27. For linear measurements of highest precision, the tape which is to be recommended is :

(A) linen tape (B) metallic tape

(C) steel tape (D) invar tape

28. For important works, moist curing on the exposed surface of concrete is done at least for a period of :

(A) 14 days (B) 28 days

(C) 7 days (D) 3 days

29. Generally adopted nominal size of course aggregate for reinforced concrete construction is :

(A) 20 mm (B) 10 mm

(C) 12 mm (D) 40 mm

30. A water is said to be acidic, when it's p^H value :

(A) greater than 17 (B) greater than 7

(C) less than 7 (D) equal to 7

31. In a well-conditioned triangle no angle greater than :

(A) 100° (B) 60°

(C) 120° (D) 75°

32. The force acting along the circumference will cause stress in the walls in a direction normal to the longitudinal axis of cylinder, this stress is termed as :

(A) longitudinal stress (B) hoop stress

(C) yield stress (D) ultimate stress

33. The shear strength of a beam can be increased by :

(A) using binding wires

(B) using more water on concrete during its mixing

(C) providing stirrups

(D) rubbing the bars with emery paper before placing.

34. A surge tank is provided to :

(A) release the entrapped air

(B) eliminate smell and odour

(C) keep the constant pressure

(D) relieve the pressure due to water hammer

35. The constant vertical distance between two adjacent contour is called :

(A) contour interval
(B) horizontal equivalent
(C) horizontal interval
(D) none of the above

36. A planimeter is used for :

(A) the measurement of distance
(B) carpentry works
(C) enlarging and reducing plans
(D) measurement of plan areas

37. The value of modulus of elasticity of steel is :

(A) 0.002×10^6 N/mm^2
(B) 0.02×10^5 N/mm^2
(C) 0.2×10^5 N/mm^2
(D) 2×10^5 N/mm^2

38. The velocity of a fluid particle at the centre of a pipe section is :

(A) maximum
(B) minimum
(C) equal everywhere
(D) none of the above

39. Latitude of a traverse line is obtained by multiplying its length by :

(A) Tangent of its reduced bearing
(B) Cosine of its reduced bearing
(C) Deflection angle is radians
(D) Sine of its reduced bearing

40. Modulus of rigidity is :

(A) $\frac{\text{Shear force}}{\text{Bending moment}}$
(B) $\frac{\text{Linear stress}}{\text{Linear strain}}$
(C) $\frac{\text{Lateral strain}}{\text{Linear strain}}$
(D) $\frac{\text{Shear stress}}{\text{Shear strain}}$

41. The well-known Nagpur plan is associated with :

(A) Construction of Shipyards in India
(B) Construction of Railways in India
(C) Construction of Highways in India
(D) Construction of Airports in India

42. The quantity of cement required for 12mm thick cement sand plastering in the ratio 1:5 one coat for 10 Sq.m is :

(A) 49 kg
(B) 47 kg
(C) 57 kg
(D) 43 kg

43. Net Income × years purchase is equal to :

(A) Book value
(B) Scrap value
(C) Capitalized value
(D) Depreciated value

44. Due to the attack of dry rot, the timber :

(A) Shrinks
(B) Swells
(C) Cracks
(D) Reduces to powder

45. Galvanizing means, covering Iron with a thin coat of :

(A) Poly urethane
(B) Tin
(C) Zinc
(D) Chromium

46. Generally, in a steel member, maximum deflection should not be greater than :

(A) $\frac{\text{span}}{750}$
(B) $\frac{\text{span}}{325}$
(C) $\frac{\text{span}}{500}$
(D) $\frac{\text{span}}{225}$

47. Well foundations are commonly used for :

(A) Water tank of capacity 500 litres
(B) Bridges
(C) Residential buildings
(D) For the foundation of centrifugal pump

48. Soil is dried beyond its shrinkage limit, it will show :

(A) Large volume change
(B) No volume change
(C) Low volume change
(D) Moderate volume change

49. An area of one hectare is :

(A) $10\,m^2$
(B) $100\,m^2$
(C) $1000\,m^2$
(D) $10000\,m^2$

50. The deflection at the free end of a cantilever beam carrying concentrated load W at the free end and having span L and flexural rigidity EI is equal to :

(A) $\frac{WL^3}{3EI}$
(B) $\frac{WL^3}{8EI}$
(C) $\frac{WL^4}{6EI}$
(D) $\frac{WL^3}{2EI}$

51. Sieve analysis is a procedure used to determine :

(A) Slump value of concrete

(B) Flakiness index number of coarse aggregate

(C) To remove larger size particles

(D) Particle size distribution of a granular material

52. Drop man holes are provided in sewerage system when there is :

(A) A change from gravity system to pressure system

(B) A change in the alignment of sewer line

(C) Change in the elevation of ground level

(D) Change in the size of sewer

53. IRC recommended Camber value on bituminous roads for heavy rainfall area :

(A) 1.7%

(B) 2%

(C) 2.5%

(D) 4%

54. The best method of interpolation of contour is by :

(A) Computation

(B) Graphical means

(C) Estimation

(D) Emperical methods

55. If A is the cross section area of a R.C.C. slab and if HYSD bars and M20 concretes are used, The minimum percentage of steel provided is :

(A) 0.48% of A

(B) 0.42% of A

(C) 0.12% of A

(D) 0.15% of A

56. The lateral ties in a reinforced rectangular column under axial compression are used :

(A) For confinement of concrete

(B) To reduce axial deformation

(C) To provide adequate shear capacity

(D) To avoid buckling of the longitudinal steel area under compression

57. The amount shown in the account book after allowing necessary depreciation is :

(A) Scrap value

(B) Book value

(C) Net value

(D) Gross value

58. Barometers are used to measure :

(A) Pressure in water channels

(B) Very low pressure

(C) Difference in pressure at two points

(D) Atmospheric pressure

59. Plotting of inaccessible points on a plane table is done by the method of :

(A) intersection (B) radiation

(C) traversing (D) all the above

60. A type of rock formed by the deposition of materials at the earth's surface by the action of water, wind and other natural agencies :

(A) Plutonic rock (B) Magmatic rock

(C) Sedimentary rock (D) Volcanic rock

61. Bitumen felt is :

(A) Used as a water proofing material

(B) Used as a damp proofing material

(C) Made from bitumen and Hessian fibre

(D) All the above

62. The characteristic strength of concrete is defined as the compressive strength below which not more than :

(A) 20% results are expected to fall

(B) 5% results are expected to fall

(C) 2% results are expected to fall

(D) 15% results are expected to fall

63. The radius of gyration k of a section of area A, the least moment of inertia I about the centroidal axis is obtained from the relation :

(A) $I = A^2K$ (B) $I = \sqrt{AK}$

(C) $I = A^2\sqrt{K}$ (D) $I = AK^2$

64. A type of survey in which the curvature of earth is taken into consideration is :

(A) Geodetic survey (B) Plane table survey

(C) Topographical survey (D) Military survey

65. The standard trimmed size of AO drawing sheet is :

(A) 841 × 1189 mm (B) 625 × 880 mm

(C) 300 × 240 mm (D) 450 × 625 mm

66. A fixed beam AB of span L and carrying uniformly distributed load w/m on the entire span, its fixing moment values MA and MB are equal and is given by the expression :

(A) $\frac{WL^2}{8}$ (B) $\frac{WL^2}{12}$

(C) $\frac{WL^2}{2}$ (D) $\frac{WL}{4}$

67. The gradual accumulation of amount by way of deposits for the replacement of the structure at the end of it's useful period is called :

(A) Annuity (B) Depreciation

(C) Sinking fund (D) Solatium

68. A material which shows same elastic properties in all the directions at the point is said to be :

(A) Orthotropic (B) Isotropic

(C) Homogeneous (D) Isogonic

69. A truss containing j joints and m members will be a perfect simple truss if :

(A) $j = 3m - 2$ (B) $j = 2m - 3$

(C) $m = 2j - 3$ (D) $m = 3j - 2$

70. The magnitude of shear stress due to shear force F on a rectangular section of are A at Neutral axis is :

(A) $\frac{F}{A}$ (B) $\frac{F}{2A}$

(C) $\frac{2F}{3A}$ (D) $\frac{3F}{2A}$

71. The function of ballast in railway track is to :

(A) Facilitate drainage

(B) Provide the necessary resilience against dynamic effect of the loads

(C) Serve as an elastic support for the track structure

(D) All the above

72. A structure in which the number of reactive components is equal to number of available conditions is known as :

(A) Determinate structure (B) Indeterminate structure

(C) Intermediate structure (D) Improper structure