

80/2014

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. The general method of determining the distance of boundaries during reconnaissance survey :

- (A) Tachcometry (B) Pacing  
(C) Direct method (D) Speedometer

2. The Bowditch rule is based on the assumption that the probable errors of closure of a traverse is proportional to:

- (A)  $3\sqrt{l}$  (B)  $l^2$   
(C)  $\sqrt{l}$  (D)  $\frac{1}{\sqrt{l}}$

Where 'l' is the length of the line?

3. The methods of plane surveying can be done for an area, not more than :

- (A) 250 Sqkm (B) 500 Sqkm  
(C) 1000 Sqkm (D) 5000 Sqkm

4. Which one of the following scales is the smallest?

- (A) 1 mm = 1 m (B)  $RF = \frac{1}{2000}$   
(C) 1 : 20000 (D) 1 cm = 1 km

5. The coefficient of linear expansion of invar as compared to that of ordinary steel is about :

- (A)  $\frac{1}{30}$  (B)  $\frac{1}{300}$   
(C)  $\frac{1}{3000}$  (D)  $\frac{1}{30000}$

6. For a well conditioned triangle, its angle should not be less than :

- (A)  $90^\circ$  (B)  $120^\circ$   
(C)  $30^\circ$  (D)  $15^\circ$

7. The angle of dip at the magnetic pole is :

- (A)  $90^\circ$  (B)  $0^\circ$   
(C)  $45^\circ$  (D)  $60^\circ$

A

3

[P.T.O.]



8. The term height of instrument (H I) in leveling is :
- (A) Height of instrument axis above the station point
  - (B) Elevation of line of sight with respect to a datum
  - (C) Elevation of line of sight with respect to MSL
  - (D) Elevation of the instrument axis above the staff station
9. While leveling on a steep slope, it is preferable to setup the instrument successively along :
- (A) Zig-Zig line
  - (B) Straight line
  - (C) Curved line
  - (D) Diagonal line
10. The contour interval is :
- (A) Greater on flat ground
  - (B) Small on hilly area
  - (C) Directly proportional to the scale of map
  - (D) Inversely proportional to the scale of map
11. In a vernier theodolite having least count  $20''$ , the value of vernier scale division is :
- (A)  $59/60 \times 20''$
  - (B)  $59/60 \times 20'$
  - (C)  $1/60 \times 20^\circ$
  - (D)  $59/60 \times 20^\circ$
12. To measure a vertical angle of an object :
- (A) Vernier C should set zero
  - (B) Vernier D should set zero
  - (C) No need of set zero in the vernier
  - (D) Both verniers C and D should set zero
13. The sum of the interior angle of a closed traverse is :
- (A)  $(N - 2) \times 180^\circ$
  - (B)  $(N + 2) \times 180^\circ$
  - (C)  $(2N - 4) \times 180^\circ$
  - (D)  $(2N + 4) \times 180^\circ$
- Where 'N' is the number of angles.
14. The method of tachnometry is generally done by :
- (A) Subtense bar system
  - (B) Movable hair system
  - (C) Fixed hair system
  - (D) None of the above



15. If 'L' is the length of tracing arm, R is the radius of the anchor arm 'a' is the distance between the roller and the hinge when the wheel is beyond the hinge, the area of Zero circle is given by :

- (A)  $(L^2 - R^2 + 2aL)$  (B)  $(R^2 - L^2 - 2aL)$   
(C)  $\pi(2aL - R^2 - L^2)$  (D)  $\pi(L^2 + R^2 + 2aL)$

16. Tidal datum as compared to the M.S.L datum is usually :

- (A) Lower (B) At same level  
(C) Higher (D) None

17. The cycle of tidal phenomena governed by the moon is for :

- (A) 24 hrs (B) 24 hrs 50 minutes  
(C) 29 ½ days (D) 30 days

18. The spring tide occurs on :

- (A) 7 days after full moon (B) 14 days after full moon  
(C) 21 days after full moon (D) Full moon

19. Which of the following statements is incorrect?

- (A) An echo sounder can be used in strong currents  
(B) A sounding rod is used when currents very strong  
(C) An echo sounder is also called a ferthometer  
(D) An echo sounder will not give correct results near jetties

20. The angle from a sounding boat are measured with a :

- (A) Protractor (B) Prismatic compass  
(C) Nautical sextant (D) Box sextant

21. Polar moment of inertia of a rectangular section is of width 'b' and height 'h' is given by :

- (A)  $\frac{bh^3}{12}$  (B)  $\frac{hb^3}{12}$   
(C)  $\frac{bh^3 + hb^3}{12}$  (D)  $\frac{b^2h^2}{12}$



22. Flexural stress developed in a material results in :

- (A) Tensile stress
- (B) Compressive stress
- (C) Shear stress
- (D) Combination of tensile and compressive stress

23. The flexural rigidity of a beam is expressed by :

- (A)  $EI$
- (B)  $\frac{E}{I}$
- (C)  $\frac{I}{E}$
- (D)  $\frac{E}{I} \times Y$

24. One  $MP_a$  is equivalent to :

- (A)  $\frac{10^6 \text{ KN}}{m^2}$
- (B)  $\frac{10^3 \text{ KN}}{m^2}$
- (C)  $\frac{10^9 \text{ N}}{m^2}$
- (D)  $\frac{10^3 \text{ N}}{mm^2}$

25. The stiffness of propped cantilever is equal to :

- (A)  $\frac{4 EI}{l}$
- (B)  $\frac{2 EI}{l}$
- (C)  $\frac{8 EI}{l}$
- (D)  $\frac{41}{l}$

26. The min. diameter of longitudinal reinforcement in a column as per IS 456 :

- (A) 6 mm
- (B) 12 mm
- (C) 20 mm
- (D) 32 mm

27. When the actual shear stress  $\tau_v$  is less than the permissible shear stress  $\tau_c$ ,

- (A) Shear reinforcement should be designed
- (B) Shear reinforcement need not be designed
- (C) The design should completely revised
- (D) Need not provide shear reinforcement



28. Maximum area of tension reinforcement in a RC beam shall not exceed :
- (A) 8% of Cross sectional area of the member
  - (B) 6% of Cross sectional area of the member
  - (C) 4% of Cross sectional area of the member
  - (D) 2% of Cross sectional area of the member
29. In working stress method of design, the factor of safety for concrete is taken approximately :
- (A) 3
  - (B) 2
  - (C) 4
  - (D) 2.5
30. As per IS 456, expansion joint provided for a structure, when the length exceeds :
- (A) 40 m
  - (B) 45 m
  - (C) 50 m
  - (D) 55 m
31. The kind of plastic mainly used with concrete :
- (A) Epoxy
  - (B) Poly ethylene
  - (C) Poly propylene
  - (D) Bakelite
32. The inert material used in concrete :
- (A) Water
  - (B) Cement
  - (C) Aggregate
  - (D) Admixture
33. As per IS code, the ultimate compressive strength is determined at an age of :
- (A) 7 days
  - (B) 14 days
  - (C) 21 days
  - (D) 28 days
34. The ratio of creep strain over elastic strain is :
- (A) Creep intercept
  - (B) Creep modulus
  - (C) Creep coefficient
  - (D) Tertiary creep
35. Chemical formula of dicalcium silicate :
- (A)  $2\text{CaOSiO}_3$
  - (B)  $2\text{CaOSiO}_2$
  - (C)  $\text{CaOSiO}_2$
  - (D)  $2\text{CaOSiO}_4$
36. Which of the following name is related to soil engineering?
- (A) Blaise Pascal
  - (B) James Watt
  - (C) Rankine
  - (D) Mannings



37. The ratio of volume of voids in soil to its total volume is termed as :
- (A) Specific volume (B) Void ratio  
(C) Porosity (D) Density
38. Heating of soil upto about  $110^{\circ}$  C, for drying it, the water that is evaporated is known as :
- (A) Saturated water (B) Pore water  
(C) Adsorbed water (D) Absorbed water
39. Density of soil may be determined in the field by the method of :
- (A) Sand replacement (B) Core Cutter  
(C) Both (A) and (B) (D) None of the above
40. As per IS specification, soil having particle size b/w 0.2 mm to 0.06 mm is :
- (A) Fine Sand (B) Silt  
(C) Clay (D) Coarse Sand
41. Load of a structure transferred to a wide area of soil through :
- (A) Basement (B) Column  
(C) Beam (D) Foundation
42. For design of foundations, the bearing capacity, generally taken is :
- (A) Ultimate bearing capacity (B) Safe bearing capacity  
(C) Net bearing capacity (D) Improved bearing capacity
43. Which one of the following types of foundation is suitable for bridge?
- (A) Raft foundation (B) Caisson foundation  
(C) Grillage foundation (D) Spread foundation
44. Minimum depth of wall footing is obtained by :
- (A) Rankine's formula (B) Kutter's formula  
(C) Chezy's formula (D) Manning's formula
45. The depression provided at the top of the brick is called :
- (A) Bed (B) Header  
(C) Stretcher (D) Frog
46. The minimum lap provided for brick masonry is :
- (A) 20 mm (B) 30 mm  
(C) 50 mm (D) 100 mm



47. Brick masonry should not be constructed in a day, more than a height of :  
(A) 0.5 m (B) 1.5 m  
(C) 2.5 m (D) 3.5 m
48. The deposits on the surface of brick caused by alternate wetting and drying is called :  
(A) Efflorescence (B) Alkalies  
(C) Sulphates (D) Iron oxides
49. The projection provided on the steps of a stair is known as :  
(A) Tread (B) Rise  
(C) Nosing (D) Winders
50. The minimum width of stair case for a public building :  
(A) 0.9 m (B) 0.8 m  
(C) 1.0 m (D) 1.5 m
51. Dry rubble masonry is suitable for :  
(A) Abutment of a culvert (B) Retaining wall  
(C) Construction of weir (D) Wall foundation
52. The empty space between timber floor and concrete base is :  
(A) Filled with sand (B) Filled with clay  
(C) Filled with waste materials (D) Filled with gravel
53. The space available b/w the floor and the bottom most surface of the structure above the floor in a room is known as :  
(A) Clear space (B) Working space  
(C) Head room (D) Sick room
54. The term 'winders' is related to the construction of :  
(A) Show case (B) Stair case  
(C) Sloped roof (D) Windows
55. The construction of north light roofing is suitable for :  
(A) Residential building (B) Educational building  
(C) Industrial building (D) Hospital building



56. The 'LOTUS' temple in Delhi is an example of :
- (A) Folded plate construction (B) Shell roof construction  
(C) Corrugated roof construction (D) Zig-zag roof construction
57. Which one of the following is a term associated with an arch?
- (A) Tread (B) Berm  
(C) Haunch (D) Eave
58. The capillary rise of a liquid in a glass tube is due to :
- (A) Cohesion (B) Adhesion  
(C) Abrasion (D) Attraction
59. The reason for selection of mercury as the manometric liquid is due to its property of :
- (A) Cohesiveness (B) High specific gravity  
(C) Inert with the glass tube (D) All of the above
60. Piezometer is used to measure :
- (A) Pressure head (B) Velocity head  
(C) Total head (D) Discharged
61. Intensity of colour of water which is accepted for drinking is about :
- (A) 10 mg/l (B) 20 mg/l  
(C) 5 mg/l (D) 15 mg/l
62. Potassium permanganates is used in water, for make it :
- (A) Colourless (B) Colourfull  
(C) Odorless (D) Soft
63. If 'A' is the catchment area in sq.km and  $\lambda$  is a constant, Dicken's formula to calculated peak discharge  $Q_p$  is given by :
- (A)  $Q_p = \lambda A^{0.075}$  (B)  $Q_p = \lambda A^{0.75}$   
(C)  $Q_p = \lambda A^{1.75}$  (D)  $Q_p = \lambda A^{2.75}$
64. The pH value of potable water should be :
- (A) Purely acidic (B) Neutral  
(C) Slightly acidic (D) Slightly basic