\*\*\*Sub Engineer\*\*\*

1. If S is the length of a subchord and R is the radius of simple curve, the angle of deflection between its tangent and sub-chord, in minutes, is equal to

a. 573 R/S

b. 171.9 S/R

c. 1718.9 R/S

d. 1718.9 S/R.

2. One of the tacheometric constants is additive, the other constant, is

a. subtractive constant

b. multiplying constant

c. dividing constant

d. indicative constant.

3. Two concave lenses of 60 cm focal length are cemented on either side of a convex lens of 15 cm focal length. The focal length of the combination is

a. 10 cm

b. 20 cm

c. 30 cm

d. 40 cm

4. An ideal vertical curve to join two gradients, is

a. parabolic

b. elliptical

c. hyperbolic

d. none of these.

5. Sand stone is

a. sedimentary rock

b. metamorphic rock

c. igneous rock

d. volcanic rock.

6. Pick up the correct statement from the following:

a. For mass concrete structures subjected to wetting and drying, the water ratio should be 0.55

b. For thin structures which remain continuously under water, the water-cement ratio by weight should be 0.55

c. For massive concrete structures which remain continuously under water, the water cement ratio by weight should be 0.65

d. All the above.

7. The main constituent of fly-ash, is

a. aluminium oxide

b. silica

c. ferrous oxide

d. All of these.

8. The variety of pig iron used for the manufacture of steel by Bessemer process, is

a. Bessemer pig

b. Grey pig

c. White forge pig

d. Mottled pig.

9. A material which obeys Hook's law, is subjected to direct stress σ0. At its elastic limit, the following statement is true,

a. Maximum shear stress =

b. Strain energy =

c. Shear strain energy =

d. All the above.

10. There are two hinged semicircular arches A, B and C of radii 5 m, 7.5 m and 10 m respectively and each carries a concentrated load W at their crowns. The horizontal thrust at their supports will be in the ratio of

a. 1 : 1 1/2 : 2

b. 2 : 1 1/2 : 1

c. 1 : 1 : 2

d. none of these.

11. The ratio of the moment of inertia of a circular plate and that of a square plate for equal depth, is

a. equal to one

b. more than one

c. equal to 3π/16

d. none of these.

12. In the cantilever truss as shown in below figure, the horizontal component of the reaction at A, is

a. 30 tonnes

b. 60 tonnes

c. 90 tonnes

d. 120 tonnes

13. Most economical section of a circular channel for maximum discharge

a. hydraulic mean depth = 0.286 diameter of circular section

b. wetted perimeter = 2.6 diameter of circular section

c. wetted perimeter = 2.83 depth of water

d. all the above.

14. Reynold number is the ratio of initial force and

a. viscosity

b. elasticity

c. gravitational force

d. surface tension.

15. An independent mass of a fluid does not posses

a. elevation energy

b. kinetic energy

c. pressure energy

d. none of these.

16. Hydrostatic pressure on a dam depends upon its

a. depth

b. shape

c. material

d. both (b) and (c).

17. The active earth pressure of a soil is proportional to (where φ is the angle of friction of the soil)

a. tan (45° - φ)

b. tan2 (45° + φ/2)

c. tan2 (45° - φ/2)

d. tan (45° + φ)

18. Accurate determination of water content, is made by

a. calcium carbide method

b. sand bath method

c. alcohol method

d. oven-drying method.

19. The liquidity index is defined as a ratio expressed as percentage of

a. plastic limit minus the natural water content, to its plasticity index

b. natural water content minus its plastic limit to its plasticity index

c. natural water content plus its plastic limit to its plasticity index

d. liquid limit minus the natural water content to the plasticity index.

20. Geologic cycle for the formation of soil, is

a. Weathering → upheaval → transportation → deposition

b. Transportation → upheaval → weathering → deposition

c. Weathering → transportation → deposition → upheaval

d. None of these.

21. Design of R.C.C. simply supported beams carrying U.D.L. is based on the resultant B.M. at

a. supports

b. mid span

c. every section

d. quarter span.

22. The effective span of a simply supported slab, is

a. distance between the centres of the bearings

b. clear distance between the inner faces of the walls plus twice the thickness of the wall

c. clear span plus effective depth of the slab

d. none of these.

23. The amount of reinformcement for main bars in a slab, is based upon

a. minimum bending moment

b. maximum bending moment

c. maximum shear force

d. minimum shear force.

24. High strength concrete is used in prestressed member

a. to ovecome bursting stresses at the ends

b. to provide high bond stresses

c. to overcome cracks due to shrinkage

d. all the above.

25. In English garden wall bond

a. one course of headers to three or five course of stretchers

b. queen closer in provided in each heading course

c. the middle course of stretchers is started with a header to give proper vertical joints

d. all the above.

26. Pick up the correct statement from the following:

a. Flush door is generally provided in dinning room

b. Revolving door is generally provided in cinema halls

c. Sliding door is generally provided in show rooms

d. All the above.

27. M 150 grade of concrete approximates

a. 1 : 1 :2 mix

b. 1 : 2 : 4 mix

c. 1 : 1.5 : 3 mix

d. none of these.

28. The increased cohesiveness of concrete, makes it

a. less liable to segregation

b. more liable to segregation

c. more liable to bleeding

d. more liable for surface scaling in frosty weather

29. Acidity in water is caused due to

a. Free CO2

b. Iron sulphate

c. Aluminium sulphate

d. All the above.

30. By boiling water, hardness can be removed if it is due to

a. magnesium sulphate

b. calcium nitrate

c. calcium bicarbonate

d. none of these.

31. The non-clog pump which permits solid matter to pass out with the liquid sewage, is

a. centrifugal pump

b. reciprocating pump

c. pneumatic ejector

d. none of these.

32. When drainage to sewage ratio is 20, the peak dry weather flow is

a. 20% of the design discharge

b. slightly less than 5% of the design discharge

c. slightly more than 5% of the design discharge

d. none of these.

33. The measure to remove water logging of land, is

a. to reduce percolation from canals and water courses

b. to increase outflow from the ground water reservoir

c. both (a) and (b)

d. neither (a) nor (b)

34. When a canal flowing under pressure is carried below a natural drainage such that its F.S.L. does not touch the underside of the supporting structure, the structure so provided, is called

a. syphon

b. aqueduct

c. super passage

d. syphon-aqueduct.

35. According to G.W. Pickles the effect of confining the flood water of a river between levee, is to increase

a. water surface elevation during floods

b. maximum discharge

c. velocity and scouring action

d. surface slope of streams above the leveed portion.

36. The main function of a diversion head works of a canal from a river, is

a. to control floods

b. to store water

c. to raise water level

d. all the above.

37. On the recommendations of Indian Road Congress, the ruling gradient in plains, is

a. 1 in 20

b. 1 in 30

c. 1 in 45

d. 1 in 100

38. If the ruling gradient on any highway is 3%, the gradient provided on the curve of 300 metre radius, is

a. 2.25%

b. 2.50%

c. 2.75%

d. 3.00%

39. Traffic engineering only includes

a. design and application of control devices

b. analysis of traffic characteristics

c. traffic opeation

d. all the above.

40. Pick up the incorrect statement from the following. The super-elevation on roads is

a. directly proportional to width of pavement

b. directly proportional to velocity of vehicles

c. inversely proportional to acceleration due to gravity

d. inversely proportional to the radius of curvature.

41. The order of booking dimensions is

a. Length, breadth, height

b. Breadth, length, height

c. Height, breadth, length

d. None of these.

42. In the mid-section formula

a. The area of mid-sections is calculated by using mean depth

b. The volume of the earth work is calculated by multiplying the mid-section area by the distance between the two sections

c. The volume of the earth work is calculated by multiplying the mid-section area by the distance between the two original sections

d. (a), (b) and (c) of the above.

43. The plinth area of a building not includes

a. area of stair cover

b. internal shaft for sanitary installations up to 2 sq m. in area

c. lift and wall including landing

d. area of cantilevered porch.

44. 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 these.

45. Which one of the following represents an activity

a. curing of concrete

b. setting of question paper

c. preparation of breakfast

d. all the above.

46. A critical ratio scheduling

a. determines the status of each activity

b. adjusts automatically changes in activity progress

c. is a dynamic system

d. none of these.

47. The main principle of an organisation, is

a. cohegency

b. effective control at all levels

c. delegation of authority

d. all the above.

48. Mile Stone charts were invented in the year of

a. 1920

b. 1930

c. 1940

d. 1950

49. International Civil Aviation Organisation (I.C.A.O.) was set up at Montreal (Canada), in

a. 1929

b. 1939

c. 1947

d. 1950

50. Pick up the incorrect statement from the following:

a. L.M.M. is installed at 1.0 km from the threshold

b. Localizer antenna is installed at 300 m from the other end of the runway

c. Glide slope antenna is installed at the centre of the runway about 150 m on one side

d. None of these.