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

1. The probable error of the adjusted bearing at the middle is

a. rn

b. rn

c. rn

d. rn.

2. 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.

3. The radius of curvature of the arc of the bubble tube is generally kept

a. 10 m

b. 25 m

c. 50 m

d. 100 m

4. If h is the difference in level between end points separated by l, then the slope correction is . The second term may be neglected if the value of h in a 20 m distance is less than

a. m

b. 1 m

c. 2 m

d. 3 m

5. Vanadium steel is generally used for

a. railway switches and crossing

b. bearing balls

c. magnets

d. axles and springs.

6. The initial setting time of lime-pozzolana, is

a. 30 minutes

b. 60 minutes

c. 90 minutes

d. 120 minutes.

7. The variety of pig iron used for manufacture of wrought iron, is

a. Bessemer pig

b. Grey or foundry pig

c. White forge pig

d. Mottled pig.

8. Depending on the chemical composition and mechanical properties, iron may be classified as

a. cast iron

b. wrought iron

c. steel

d. all the above.

9. In plastic analysis, the shape factor for a circular section, is

a. 1.5

b. 1.6

c. 1.7

d. 1.75

10. For determining the support reactions at A and B of a three hinged arch, points B and C are joined and produced to intersect the load line at D and a line parallel to the load line through A at D'. Distances AD, DD' and AD' when measured were 4 cm, 3 cm and 5 cm respectively. The angle between the reactions at A and B is

a. 30°

b. 45°

c. 60°

d. 90°

11. The maximum twisting moment a shaft can resist, is the product of the permissible shear stress and

a. moment of inertia

b. polar moment of inertia

c. polar modulus

d. modulus of rigidly.

12. For a simply supported beam with a central load, the bending moment is

a. least at the centre

b. least at the supports

c. maximum at the supports

d. maximum at the centre.

13. The momentum correction factor (β) for the viscous flow through a circular pipe is

a. 1.33

b. 1.50

c. 1.66

d. 2.00

14. The Empirical formula for discharge over large rectangular weirs, is known as

a. Francis formula

b. Bazin formula

c. Rehbook formula

d. Kutter's formula.

15. The property of steam function ψ is :

a. the flow around any path in the fluid is zero for continuous flow

b. the rate of change of ψ with distance in an arbitrary direction, is proportional to the component of velocity normal to that direction

c. the velocity vector may be found by differentiating the stream function

d. all the above.

16. If the volume of a liquid weighing 3000 kg is 4 cubic metres, 0.75 is its

a. specific weight

b. specific mass

c. specific gravity

d. none of these.

17. The internal molecular attraction of a soil, the cohesion

a. decreases as the moisture content increases

b. increases as the moisture content decreases

c. is more in well compacted clays

d. depends upon the external applied load.

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. Pick up the correct statement from the following:

a. Silty clayloam contains highest percentage of silt

b. Stiff boulder clay offers maximum shear strength

c. Soft chalk carries least safe load

d. All the above.

20. The liquid limit and plastic limit exist in

a. sandy soils

b. silty soils

c. gravel soils

d. clay soils.

21. The transverse reinforcements provided at right angles to the main reinforcement

a. distribute the load

b. resist the temperature stresses

c. resist the shrinkage stress

d. all the above.

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. Design of a two way slab simply supported on edges and having no provision to prevent the corners from lifting, is made by

a. Marcus formula

b. Rankine Grashoff formula

c. Grashoff formula

d. Rankine-Marcus formula.

24. If the effective length of a 32 cm diameter R.C.C. column is 4.40 m, its slenderness ratio, is

a. 45

b. 50

c. 55

d. 60

25. The pile which is provided with a bulb filled with concrete at its lower end, is known as

a. Mac-Arthur pile

b. Raymond pile

c. Franki pile

d. none of these.

26. Queen closer may be placed

a. in stretcher course

b. in header course next to first brick

c. in stretcher course next to first brick

d. in any position.

27. According to I.S. : 456, the number of grades of concrete mixes, is

a. 4

b. 5

c. 6

d. 7

28. Transport of concrete by pumps, is done for a distance of

a. 200 m

b. 300 m

c. 400 m

d. none of these.

29. Average annual rainfall at any station is the average of annual rainfall over a period of

a. 14 years

b. 21 years

c. 28 years

d. 35 years.

30. Manholes along the mains from the source to a city are provided at 500 m intervals in

a. steel pipes

b. R.C.C. pipes

c. hume steel pipes

d. all the above.

31. 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.

32. 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.

33. The top of the capillary zone

a. lies below the water table at every point

b. lies above the water table at every point

c. coincides the water table at every point

d. none of these.

34. For loss of head in a canal inverted syphon barrel, the factor in the Unwin formula is a coefficient for loss of head due to

a. friction

b. exit

c. entry

d. gradient

35. When a canal and a drainage approach each other at the same level, the structure so provided, is

a. an aqueduct

b. a syphon

c. a level crossing

d. inlet and outlet.

36. The sinuosity of a meander is the ratio of

a. meander length and the width of meander

b. meander length and half width of the river

c. curved length and the straight distance

d. none of these.

37. The usual width of parapet walls along Highways in hilly region, is

a. 60 cm

b. 70 cm

c. 80 cm

d. 100 cm

38. A single lane carriage way whenever changes to two-lane carriage way, is affected through a taper of

a. 1 in 10

b. 1 in 15

c. 1 in 20

d. 1 in 15 to 1 in 20

39. The period of long term plan for the development of roads in India, known as Bombay Plan (Aug. 1958), is

a. 10 years

b. 15 years

c. 20 years

d. 25 years

40. Road makers along roads from the edge of a kerb should not be less than

a. 45 cm

b. 50 cm

c. 55 cm

d. 60 cm

41. The main factor to be considered while preparing a detailed estimate, is

a. Availability of materials

b. Transportation of materials

c. Location of site and local labour charges

d. All the above.

42. Pick up the correct statement from the following:

a. The actual expenditure involved to complete a work including incidental, establishment and travelling charges, is called actual cost

b. The formal acceptance by the administrative department for incurring an expenditure on the work, is called administrative approval

c. The order of a competent authority sanctioning a properly detailed estimate of the cost of a work of construction or repair is called technical sanction

d. All the above.

43. Pick up the excavation where measurements are made in square metres for payment.

a. surface dressing up to 15 cm depths

b. Surface excavation up to 30 cm depths

c. Both (b) and (c)

d. Both (a) and (b)

44. The correct prismoidal formula for volume is

a. D [first area + last area + ∑ Even area + 2 ∑ odd areas]

b. [first area + last area + 4 ∑ Even area + 2 ∑ odd areas]

c. [first area + last area + 2 ∑ Even area + 4 ∑ odd areas]

d. [first area + last area + 2 ∑ Even area + 4 ∑ odd areas].

45. The main principle of an organisation, is

a. cohegency

b. effective control at all levels

c. delegation of authority

d. all the above.

46. The artificial activity which indicates that an activity following it, cannot be started unless the preceding activity is complete, is known as

a. event

b. free float

c. dummy

d. constant

47. Pick up the correct statement from the following:

a. If the float is positive and the activity is delayed by a period equal to its total float, the completion of project is not delayed

b. If the float of an activity is negative, delay in its performance is bound to delay the completion of project

c. If the float of an activity is zero, the activity is critical and any delay in its performance will delay the whole project

d. All the above.

48. Pick up the correct statement from the following:

a. PERT analysis is event oriented

b. CPM does not make any allowance for the uncertainties in the duration of time

c. In CPM, the time is related to cost

d. All the above.

49. The maximum length and pavement strength of the runway is that of

a. A 1

b. B 2

c. B 3

d. G 7

50. The meterological condition which influences the size and location of an air port is

a. air density

b. reduced level

c. wind direction

d. all the above.