Ph.D. Entrance Examination
November - 2022
Part - C
(Civil Engineering)
Time : 50 Minutes
Maximum Marks : 50
(Minimum Passing Marks : 25)

Note :

(i)   This question booklet comprises of 50 questions.

(ii)   All questions are compulsory.

(iii)   The question booklet along with answer sheet is to be handed over by the candidate to the Invigilator at the end of the examination.

(iv)   There is no negative marking.

(v)   Each question carries one mark.

Multiple Choice Questions :

1.   The factor affecting the mix design of concrete is

   (a)   slump   (b)   w/c ratio   (c)   Fineness modulus   (d)   all of these

2.   In Self compacting concrete, the proportion of coarse aggregates is …..and that of sand is …., in comparison to conventional concrete.

   (a)   more,more   (b)   more,less   (c)   less,more   (d)   less,less

3.   Mix proportion for M 20 grade of Concrete is

   (a)   1:1.5:3   (b)   1:2:4   (c)   1:1:2   (d)   1:3:5

4.   Water which is suitable for …….is generally consider fit for concrete making.

   (a)   Industrial use   (b)   Agriculture   (c)   Drinking   (d)   None of these

5.   Concrete should be free from

   (a)   Segregation   (b)   Bleeding

   (c)   Both (a) and (b)   (d)   workability

6.   W/c ratio is ratio between

   (a)   Weight of cement to Weight of water

   (b)   Volume of cement to volume of water

   (c)   Volume of water to Volume of cement

   (d)   Weight of water to weight of cement

7. Initial setting time of cement is not less than

(a)   30 minutes   (b)   180 minutes

(c)   360 minutes   (d)   24 hours

8. Which among the followings is a design mix concrete

(a)   M 30   (b)   M 10   (c)   M 15   (d)   All of the above

9. In M- 60 grade of concrete, M stands for

(a)   Mixture   (b)   Mix   (c)   Moderate   (d)   None of the above

10. While defining characteristic compressive strength of concrete f_{ck},…..% samples should have strength above fck

(a)   100   (b)   95   (c)   80   (d)   none of these

11. Conditions of static equilibrium are

(a) $\sum V=0$ (b) $\sum H=0$ (c) $\sum M=0$ (d)   All of these

12. When equal and opposite forces applied to a body, tend to shorten it, the stress so produced is called

(a)   compressive stress   (b)   shear stress

(c)   tensile stress   (d)   transverse stress

13. The slope at fixed support will be equal to

(a)   1   (b)   zero   (c)   0.5   (d)   None of these

14. Determinate structures are free from

(a)   Flexural stresses   (b)   shear stresses

(c)   Temperature stresses   (d)   all of these

15. A three hinged arch is

(a)   indeterminate structure   (b)   determinate structure

(c)   instable structure   (d)   all of these

16. For preparation of ILD ,…. Load is rolled on the structure.

(a)   Heavy   (b)   0   (c)   unit   (d)   any load

17. Which among followings is an indeterminate structure

(a)   Two hinged arch   (b)   Three hinged arch

(c)   simply supported beam   (d)   None of these

18. The summation of distribution factors at a joint shall be equal to

(a)   1   (b)   0   (c)   any number (d)   none of these

19. The Indian standard code which deals with design of RCC structure, is

(a)   IS:800   (b)   IS:456   (c)   IS:865   (d)   IS:12820

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20. Simple bending theory equation is

(a) M/I=R/E=f/y   (b) M/I=E/R=f/y

(c) M/I=R/E=y/f   (d) none of these

21. The equivalent length of a column hinged at both ends, is

(a) 0.5L   (b) 2L   (c) 0.75L   (d) L

22. At point of Contraflexure, BM will be

(a) Maximum (b) Zero (c) Minimum   (d) changing sign

23. Ratio of volume of voids to volume of solids is called

(a) void ratio (b) porosity (c) % air voids (d) water content

24. Soil which is completely dry, will be called as soil in ….phase system.

(a) two   (b) three   (c) one   (d) none of these

25. Liquid limit is measured by

(a) Casagrande apparatus   (b) Atterberg apparatus

(c) core cutter   (d) none of these

26. Father of soil mechanics is

(a) Taylor   (b) Terzaghi   (c) Coulomb   (d) None of these

27. Permeability is useful in the ……..

(a) Settlement of building   (b) yield of wells

(c) design of filters   (d) all of these

28. In flownet, ….the dimensions of the field, greater will be the velocity of flow through it.

(a) greater   (b) smaller   (c) any type of   (d) cannot say

29. Seepage line is also called as

(a) Phreatic line   (b) stream function line

(c) velocity potential line   (d) all of these

30. The water which is in the pores of soil and move under influence of gravity is called

(a) free water (b) held water   (c) extra water   (d) none of these

31. The upward pressure due to soil on the underside of the footing is called……

(a) positive pressure   (b) Negative pressure

(c) contact pressure   (d) effective pressure

32. In consolidation reduction of volume is due to

(a) Expulsion of air   (b) Expulsion of water

(c) dynamic load reducing voids (d) Artificial means

33. Smooth -wheel rollers are useful for

    (a) finishing operation

    (b) compaction of thicker layers more than 1 m thickness

    (c) for kneading operations

    (d) for sheep foot action

34. Consolidated-drained tests are also called as ….test

    (a) Quick   (b) semi-quick   (c) slow   (d) normal

35. The main principle of surveying is to work

    (a) part to whole   (b) whole to part

    (c) both of these   (d) None of these

36. The area of land that can be irrigated with a unit volume of water supplied is called

    (a) Duty   (b) Delta   (c) Both of these   (d) None of these

37. ……is the depth of water required to raise a crop over a unit area.

    (a) Duty   (b) Delta   (c) Both of these   (d) None of these

38. Creep is …….

    (a) time dependent   (b) time independent

    (c) temperature dependent   (d) None of these

39. As per IS 456 :2000, there are five … conditions.

    (a) Environmental exposure   (b) chemical conditions

    (c) thermal conditions   (d) none of these

40. Concrete should not be done, when temp. is

    (a) Above 40^0 C   (b) between 20 to 30^0 C

    (c) above 50^0 C   (d) between 10 to 20^0 C

41. ….. is the graphical representation of elevations of given terrain.

    (a) Plane table survey   (b) Triangulation

    (c) Contour   (d) None of these

42. Whole circle bearing of $123^0.30'$ will be ………. In Quadrantal bearing system.

    (a) S $56^0.30'$ E   (b) N $56^0.30'$ E

    (c) S $56^0.30'$ W   (d) None of these

43. In uniform flow, the velocity of fluid is

    (a) Zero   (b) Uniformly Varying

    (c) Constant   (d) None of these

44. Partial differential derivative (w.r.t. a particular direction) of ……..gives velocity component in that direction .

    (a) Stream function   (b) Velocity potential

    (c) Reynolds Number   (d) None of these

45. The Energy Grade Line shows the height of the ……

    (a) Elevation Head   (b) Pressure Head

    (c) Total Bernoulli Constant Head (d) All of these

46. Channel losses are

    (a) Evaporation   (b) Seepage

    (c) Both of these   (d) None of these

47. The Ideal Site for a Rain gauge station is

    (a) Coniferous Forest   (b) Deciduous Forest

    (c) Mediterranean Forest   (d) All of these

48. …… is the maximum gradient within which highway engineer attempts to design the vertical profile of a road.

    (a) Exceptional gradient   (b) Limiting gradient

    (c) Both (a) and (b)   (d) Ruling gradient

49. Absolute minimum sight distance is also called as ……sight distance.

    (a) Stopping   (b) Safe overtaking   (c) Both (a) and (b)   (d) None of these

50. Super elevation is also called as

    (a) Banking   (b) Cant   (c) Both (a) and (b)   (d) None of these

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