

SEAL

DO NOT OPEN THE SEAL UNTIL INSTRUCTED TO DO SO

Series :

A

Question Booklet No.

103039

LT/C/03/2024 EXAM.

2024

Invigilator's Signature

Candidate's Signature

Time : 2 Hours

Maximum Marks : 100

ROLL NO.

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LT/C/03/2024 EXAM. 2024/7-A

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1. If the voids of the soil mass are full of air only, the soil is termed as
 - [A] air entrained soil
 - [B] partially saturated soil
 - [C] dry soil
 - [D] dehydrated soil

2. The ratio of the volume of voids to the volume of soil solids in a given soil mass is known as
 - [A] porosity
 - [B] specific gravity
 - [C] void ratio
 - [D] water content

3. Water content of soil can
 - [A] be less than 0%
 - [B] be greater than 100%
 - [C] never be greater than 100%
 - [D] take values only from 0% to 100%

4. The bearing capacity of a soil depends upon
 - [A] internal frictional resistance of particles
 - [B] shape of the particles
 - [C] cohesive properties of particles
 - [D] All of the above

5. Allowable bearing capacity of the foundation depends upon
 - [A] allowable settlement only
 - [B] ultimate bearing capacity of the soil
 - [C] both allowable settlement and ultimate bearing capacity of the soil
 - [D] None of the above

6. Rise of water table in cohesionless soils up to ground surface reduces the net ultimate bearing capacity approximately by
 - [A] 25%
 - [B] 50%
 - [C] 75%
 - [D] 90%

7. The maximum differential settlement in isolated footing on clayey soils should be limited to
 - [A] 25 mm
 - [B] 40 mm
 - [C] 65 mm
 - [D] 100 mm

8. A combined footing is generally used when
 - [A] number of columns is more than two and they are spaced far apart
 - [B] number of columns is two and they are spaced close to each other
 - [C] number of columns is two and they are spaced far apart
 - [D] there is only one column



9. Which of the following trees yields hard wood?

- [A] Deodar
- [B] Chir
- [C] Shisham
- [D] Pine



10. If fineness modulus of sand is 2.5, it is graded as

- [A] very fine sand
- [B] fine sand
- [C] medium sand
- [D] coarse sand

11. Putty is made up of

- [A] white lead and turpentine
- [B] powdered chalk and raw linseed oil
- [C] red lead and linseed oil
- [D] zinc oxide and boiled linseed oil

12. The trunk of the tree left after cutting all the branches is known as

- [A] log
- [B] batten
- [C] plank
- [D] baulk

13. Which of the following stones is best suited for the construction of piers and abutment of bridges?

- [A] Granite
- [B] Sand stone
- [C] Limestone
- [D] Quartzite

14. The frog of the brick in a brick masonry is generally kept on

- [A] bottom face
- [B] top face
- [C] shorter side
- [D] longer side

15. Hydraulic lime is obtained by

- [A] burning of limestone
- [B] burning of kankar
- [C] adding water to quicklime
- [D] calcination of pure clay

16. Which of the following is the purest form of iron?

- [A] Cast iron
- [B] Wrought iron
- [C] Mild steel
- [D] High carbon steel

17. As compared to the stretcher course, the thickness of joints in header course should be
- [A] less
 - [B] more
 - [C] equal
 - [D] equal and more
18. In brick masonry the bond produced by laying alternate headers and stretchers in each course is known as
- [A] English bond
 - [B] double Flemish bond
 - [C] zigzag bond
 - [D] single Flemish bond
19. The height between the two floors is 3.0 m and riser is 15 cm. Assuming two flights between the floors, the number of treads will be
- [A] 18
 - [B] 19
 - [C] 20
 - [D] 21
20. In the designation 10 DS 20, the letter D stands for
- [A] single shutter
 - [B] double shutter
 - [C] door opening
 - [D] window opening
21. Modulus of rigidity is defined as the ratio of
- [A] longitudinal stress to longitudinal strain
 - [B] shear stress to shear strain
 - [C] stress to strain
 - [D] stress to volumetric strain
22. For an isotropic, homogeneous and elastic material obeying Hooke's law, number of independent elastic constants is
- [A] 2
 - [B] 3
 - [C] 9
 - [D] 1
23. Two bars of different materials are of the same size and subjected to same tensile force. If the bars have unit elongations in the ratio of 4 : 7, then the ratio of moduli of elasticity of the two materials is
- [A] 7 : 4
 - [B] 4 : 7
 - [C] 4 : 17
 - [D] 16 : 49
24. Maximum bending moment in a beam occurs where
- [A] deflection is zero
 - [B] shear force is maximum
 - [C] shear force is minimum
 - [D] shear force changes sign

25. The sum of the normal stresses is

- [A] constant
- [B] variable
- [C] dependent on the plane
- [D] None of the above

26. Shear stress on principal plane is

- [A] zero
- [B] maximum
- [C] minimum
- [D] None of the above

27. Rate of change of bending moment is equal to

- [A] shear force
- [B] deflection
- [C] slope
- [D] rate of loading

28. The difference in ordinate of the shear curve between any two sections is equal to the area under

- [A] load curve between these two sections
- [B] shear force between these two sections
- [C] bending moment curve between these two sections
- [D] load curve between these two sections plus concentrated loads applied between the sections

29. Principle of superposition is applicable when

- [A] deflections are linear functions of applied forces
- [B] material obeys Hooke's law
- [C] the section of applied forces will be affected by small deformations of the structure
- [D] None of the above

30. Caissons are used for structure such as

- [A] bridge pier
- [B] 10-storeyed building
- [C] river abutments
- [D] Both [A] and [C]

31. Pneumatic caisson consists of

- [A] air lock
- [B] decompression chamber
- [C] Both [A] and [B]
- [D] None of the above

32. Well foundation is the name given to

- [A] box caisson
- [B] open caisson
- [C] floating caisson
- [D] None of the above



33. Negative skin friction on pile is dominant in
- [A] friction pile in soft clay
 - [B] friction pile in sands
 - [C] friction per bearing piles
 - [D] piles resting on hard sands
34. Chances of settlement is more in
- [A] cohesive soil
 - [B] non-cohesive soil
 - [C] Both [A] and [B]
 - [D] None of the above
35. The nature of the cofferdam enclosure is generally
- [A] permanent
 - [B] temporary
 - [C] almost permanent
 - [D] semi-permanent
36. Foundation settlement is not always dangerous if it settles throughout
- [A] uniformly
 - [B] within desired limit
 - [C] Both [A] and [B]
 - [D] None of the above
37. Sand is produced by crushing in
- [A] hammer mill
 - [B] ball mill
 - [C] gyrator
 - [D] jaw crusher
38. Trenching machine cannot be used for
- [A] rocks
 - [B] hard clay
 - [C] muddy clay
 - [D] loose material
39. Which of the following is **not** an excavating equipment?
- [A] Power shovel
 - [B] Scraper
 - [C] Dragline
 - [D] Hoe
40. Economic span of a bridge is the span at which the correct relation between the cost of substructure and cost of superstructure is
- [A] equal
 - [B] more
 - [C] less
 - [D] Cannot be predicted in advance
41. The unit of measurement for steel works in trusses and its parts is
- [A] quintal
 - [B] cm
 - [C] numbers
 - [D] kilograms



42. The unit of measurement of concrete work in RCC is

- [A] square meter
- [B] cubic meter
- [C] meter
- [D] quintal

43. The unit of measurement of wood work in door and window frame, rafter, beams, roof trusses etc. is

- [A] meter
- [B] sq. m
- [C] quintal
- [D] cu. m

44. Estimate expected to be least accurate is

- [A] supplementary estimate
- [B] plinth area estimate
- [C] detailed estimate
- [D] revised estimate

45. The useful part of a livable area of a building is also known as

- [A] carpet area
- [B] circulatory area
- [C] horizontal circulation area
- [D] plinth area



46. The ratio of cost of labour to the total cost of the building is

- [A] 1 : 10
- [B] 1 : 4
- [C] 1 : 1
- [D] 6 : 10

47. One brick thick wall is measured in

- [A] cubic meter
- [B] square meter
- [C] running meter
- [D] All of the above

48. It is required to plaster a wall of 4 m long, 3 m high and 30 cm thick. The cost of plastering at the rate of ₹ 8.50 per square meter would be

- [A] ₹ 102
- [B] ₹ 204
- [C] ₹ 304
- [D] ₹ 404

49. The Damp Proof Course is measured in

- [A] cu. m
- [B] sq. m
- [C] metres
- [D] None of the above

50. Due to change in price level, a revised estimate is prepared if the sanctioned estimate exceeds

- [A] 2.0 %
- [B] 2.5 %
- [C] 4.0 %
- [D] 5.0 %

51. Which of the following types of riveted joint is free from bending stress?

- [A] Lap joint
- [B] Butt joint with single cover plate
- [C] Butt joint with double cover plate
- [D] None of the above

52. Bolts are most suitable to carry

- [A] shear
- [B] bending
- [C] axial tension
- [D] shear and bending



53. A circular column section is generally not used in actual practice because

- [A] it is uneconomical
- [B] it cannot carry the load safely
- [C] it is difficult to connect beams to the round section
- [D] All of the above

54. The use of tie plate in laced column is

- [A] prohibited
- [B] not prohibited
- [C] permitted at start and end of the lacing system only
- [D] permitted between two parts of the lacing

55. Lacing bar in a steel column should be designed to resist

- [A] bending moment due to 2.5 % of the column load
- [B] shear force due to 2.5 % of the column load
- [C] 2.5 % of the column load
- [D] Both [A] and [B]

56. Gantry girders are designed to resist

- [A] lateral loads
- [B] longitudinal loads and vertical loads
- [C] lateral, longitudinal and vertical loads
- [D] lateral and longitudinal loads

57. Normally the angle of roof truss with asbestos sheets should not be less than

- [A] 26.5°
- [B] 30°
- [C] 35°
- [D] 40°

58. To minimize the total cost of a roof truss, the ratio of the cost of truss to the cost of the purlins shall be

- [A] 1
- [B] 2
- [C] 3
- [D] 4

59. Strength of concrete increases with
- [A] increase in water cement ratio
 - [B] increase in fineness of cement
 - [C] decrease in curing time
 - [D] decrease in size of aggregate
60. The compressive strength of 100 mm cube as compared to 150 mm cube is always
- [A] less
 - [B] more
 - [C] equal
 - [D] All of the above
61. For walls, columns and vertical faces of all structural members, the form work is generally removed after
- [A] 24 to 48 hours
 - [B] 3 days
 - [C] 7 days
 - [D] 14 days
62. For a cantilever of effective depth of 50 cm, the maximum span to satisfy vertical deflection limit is
- [A] 3.5 m
 - [B] 4 m
 - [C] 4.5 m
 - [D] 5 m
63. In working stress design, permissible bond stress in the case of deformed bars is more than that in plain bars by
- [A] 10%
 - [B] 20%
 - [C] 30%
 - [D] 40%
64. Half of the main steel in a simply supported slab is bent up near the support at a distance x from the center of slab bearing, where x is equal to
- [A] $1/3$
 - [B] $1/5$
 - [C] $1/7$
 - [D] $1/10$
65. The minimum cover to the ties or spirals should not be less than
- [A] 15 mm
 - [B] 20 mm
 - [C] 25 mm
 - [D] 50 mm
66. While designing the pile as a column, the end conditions are nearly
- [A] both ends hinged
 - [B] both ends fixed
 - [C] one end fixed and another end hinged
 - [D] one end fixed and another end free



67. The diameter of needle used in Vicat's apparatus for the determination of initial setting time is prescribed as

- [A] 0.5 mm
- [B] 1.0 mm
- [C] 5.0 mm
- [D] 10.0 mm

68. Increase in fineness modulus of aggregate indicates

- [A] finer grading
- [B] courser grading
- [C] gap grading
- [D] None of the above



69. The partial safety factor for steel as per IS 456 is taken as

- [A] 1.15
- [B] 1.50
- [C] 1.85
- [D] 2.20

70. According to Indian Standards, the pozzolana content in Portland pozzolana cement is

- [A] 10% to 25%
- [B] 25% to 35%
- [C] 35% to 50%
- [D] more than 50%

71. A sewer that receives the discharge of a number of house sewers is called

- [A] house sewer
- [B] lateral sewer
- [C] intercepting sewer
- [D] submain sewer

72. A pipe conveying sewage from plumbing system of a single building to common sewer or point of immediate disposal is called

- [A] house sewer
- [B] lateral sewer
- [C] main sewer
- [D] submain sewer

73. As per CPHEEO Manual, the design period for Sewage Treatment Plant is

- [A] 15 years
- [B] 30 years
- [C] 45 years
- [D] 60 years


74. The suitable system of sanitation for area of distributed rainfall throughout the year with less intensity is

- [A] separate system
- [B] combined system
- [C] partially separate system
- [D] partially combined system

75. The slope of sewer shall be
- [A] given in the direction of natural slope of ground
 - [B] given in the opposite direction of natural slope of ground
 - [C] zero
 - [D] steeper than 1 in 20
76. The minimum and maximum diameters of sewers shall preferably be
- [A] 15 cm and 100 cm
 - [B] 15 cm and 300 cm
 - [C] 30 cm and 450 cm
 - [D] 60 cm and 300 cm
77. The velocity of flow **does not** depend on
- [A] grade of sewer
 - [B] length of sewer
 - [C] hydraulic mean depth of sewer
 - [D] roughness of sewer
78. The means of access for inspection and cleaning of sewer line is known as
- [A] intake
 - [B] manhole
 - [C] drop manhole
 - [D] catch basin
79. The working condition(s) in Imhoff tanks is/are
- [A] aerobic only
 - [B] anaerobic only
 - [C] aerobic in lower compartment and anaerobic in upper compartment
 - [D] anaerobic in lower compartment and aerobic in upper compartment



80. Disinfection of water results in
- [A] removal of turbidity
 - [B] removal of hardness
 - [C] killing of disease bacteria
 - [D] complete sterilisation
81. In highway construction rolling starts from
- [A] sides and proceeds to center
 - [B] center and proceeds to sides
 - [C] one side and proceeds to other side
 - [D] bottom to top
82. For the construction of water bound macadam roads, the **correct** sequence of operation after spreading coarse aggregates is
- [A] dry rolling, wet rolling, application of screening and application of filler
 - [B] dry rolling, application of filler, wet rolling and application of screening
 - [C] dry rolling, application of screening, wet rolling and application of filler
 - [D] dry rolling, application of screening, application of filler and wet rolling
83. When the bituminous surfacing is done on already existing black top road or over existing cement concrete road, the type of treatment to be given is
- [A] seal coat
 - [B] tack coat
 - [C] prime coat
 - [D] spray of emulsion

84. Which of the following premix methods is used for base course?
- [A] Bituminous carpet
 - [B] Mastic asphalt
 - [C] Sheet asphalt
 - [D] Bituminous bound macadam
85. The suitable surfacing material for bridge deck slabs is
- [A] sheet asphalt
 - [B] bituminous carpet
 - [C] mastic asphalt
 - [D] rolled asphalt
86. The thickness of bituminous carpet varies from
- [A] 2 to 2.5 cm
 - [B] 5 to 7.5 cm
 - [C] 7.5 to 10 cm
 - [D] 10 to 12 cm
87. The drain which is provided parallel to roadway to intercept and divert the water from hill slopes is known as
- [A] sloping drain
 - [B] catch water drain
 - [C] side drain
 - [D] cross-drain
88. The walls which are necessary on the hill side of roadway where earth has to be retained from slipping is known as
- [A] retaining wall
 - [B] breast wall
 - [C] parapet wall
 - [D] None of the above
89. In hill roads the side drains are provided
- [A] only on the hill side of road
 - [B] only on the opposite side of hill
 - [C] on both sides of road
 - [D] None of the above
90. For sandy soils, the most common method of stabilization is
- [A] soil cement stabilization
 - [B] mechanical stabilization
 - [C] soil lime stabilization
 - [D] soil bitumen stabilization
91. On a horizontal curve if the pavement is kept horizontal across the alignment, then the pressure on the outer wheels will be
- [A] more than the pressure on inner wheels
 - [B] less than the pressure on inner wheels
 - [C] equal to the pressure on inner wheels
 - [D] zero
- 

92. The transition curve used in the horizontal alignment of highways as per IRC recommendations is
- [A] spiral
 - [B] lemniscate
 - [C] cubic parabola
 - [D] circular
93. In case of hill roads, the extra widening is generally provided
- [A] equally on inner and outer sides of the curve
 - [B] fully on the inner side of the curve
 - [C] fully on the outer side of the curve
 - [D] one fourth on inner side and three fourth on outer side of the curve
94. The maximum design gradient for vertical profile of a road is
- [A] ruling gradient
 - [B] limiting gradient
 - [C] exceptional gradient
 - [D] minimum gradient
95. If ruling gradient is 1 in 20 and there is also a horizontal curve of radius 76 m, then the compensated grade should be
- [A] 3%
 - [B] 4%
 - [C] 5%
 - [D] 6%
96. Air valves are generally provided in pressure pipes of water supply
- [A] at pipe junctions
 - [B] at summits
 - [C] at low points
 - [D] near service pipes
97. A centrifugal pump is required to be primed before starting if it is located
- [A] at higher level than the water level of the reservoir
 - [B] at lower level than the water level of the reservoir
 - [C] Both [A] and [B]
 - [D] Neither [A] nor [B]
98. Underground water is obtained from
- [A] rivers
 - [B] lakes
 - [C] reservoirs
 - [D] springs
99. For a well-planned city, the layout of distribution pipes generally adopted is
- [A] grid iron system
 - [B] ring system
 - [C] radial system
 - [D] dead end system
100. The most widely used pump for lifting sewage is
- [A] centrifugal pump
 - [B] reciprocating pump
 - [C] pneumatic pump
 - [D] air pressure pump



SPACE FOR ROUGH WORK

