NITTTR
Chennai

NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH
Institution Deemed to be University under Distinct Category, A Centrally Funded Technical Institute
Ministry of Education, Government of India, Taramani, Chennai - 600 113.
राष्ट्रीय तकनीकी शिक्षक प्रशिक्षण एवं अनुसंधान संस्थान
विशिष्ट श्रेणी के तहत मानित विश्वविद्यालय संस्थान, एक केंद्रीय वित्त पोषित तकनीकी संस्थान
शिक्षा मंत्रालय, भारत सरकार, तारामणि, चेन्नई - ६०० ११३.

Date of Examination:	29.05.2026						**Time: 90 Minutes**			
Name of the Post:	TECHNICAL ASSISTANT GRADE – 1 Jr. Engineer - CIVIL									
Name of the Candidate:										
Roll No:										

Candidate's Signature **Invigilator's Signature**

Instructions to the Candidate:

1. Question paper consists of **100 questions**. Questions in the form of **MCQ** type.
2. Out of 4 options given, choose the most appropriate option for each question.
3. Use of Calculators, Cell Phones and Other Electronic Devices are not permitted inside the examination hall.
4. Candidate should fill the details on both question paper booklet and OMR sheet carefully without any corrections.
5. Candidate should carefully read the instructions given on the question paper booklet and OMR sheet.
6. Candidate should mark correct answer only on OMR sheet.
7. Each question carrying **one** mark. **No negative mark for wrong answer.**
8. Clarifications on Questions are not permitted.
9. Rough works can be done in the rough sheet provided.
10. No Candidate is allowed to leave the examination hall till the examination is completed.
11. Candidate **should return question paper booklet, OMR sheet and the rough sheets after completion of examination to the invigilator.**

NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH, CHENNAI

Recruitment for the post of TECHNICAL ASSISTANT GRADE – 1
Jr. Engineer – CIVIL

1. Which material has lowest Specific Gravity?

   a. Granite
   b. Limestone
   c. Basalt
   d. Sandstone

2. Which mineral presence in stone resist abrasion more?

   a. Silica
   b. Lime
   c. Quartz
   d. None of the them

3. Consider the statements
   A) Presence of Silica leads to softness
   B) Calcite is harder than Silica

   a. Both statements are correct
   b. Statement B is correct
   c. Statement A is correct
   d. Both statements are wrong

4. Over burnt Bricks are suitable for

   a. High-precision masonry
   b. Concrete Aggregate
   c. Exposed Structural Members
   d. All of them

5. Rapid Hydration of Cement will cause

   a. Slow Setting
   b. Increased Permeability
   c. Rapid Strength gain
   d. None of the them

6. Dam structures use

   a. Low Heat Cement
   b. Rapid Hardening Cement
   c. Either of the above
   d. None of the them

7. Durable Bitumen have

   a. Lower Flash point
   b. Highly Volatile
   c. Higher Penetration
   d. None of the them

8. Wood is stronger when grains are

   a. Cross grains
   b. Transverse
   c. Longitudinal
   d. None of the them

9. Borosilicate Glasses are resistant to

   a. Chemical Corrosion
   b. Water
   c. Thermal Shock
   d. All of them

10. Blistering in Paints occurs due to

a. UV Degradation
b. Corrosion
c. Excess drying
d. Trapped Moisture

11. Asbestos are

a. Non-Composite Material
b. Plain Cement Material
c. Composite Material
d. None of them

12. Bitumen is used for

a. Water Proofing
b. Paving
c. Rust Proofing
d. All of them

13. Which Cement has faster initial setting time

a. Ordinary Portland Cement
b. Portland Pozzolana Cement
c. Both of them
d. None of them

14. Which material completely withstand fire

a. Granite
b. Limestone
c. Timber
d. None of them

15. Which material has Silica

a. Glass
b. Granite
c. Both of them
d. None of them

16. Concrete is strong in

a. Compression
b. Flexure
c. Tension
d. Torsion

17. Consider the statements
    A) Durable Concrete is Permeable
    B) Micro Cracks in Concrete are due to low compressive stress

a. Both statements are correct
b. Statement B is correct
c. Statement A is correct
d. Both statements are wrong

18. Mix Ratio for M20 grade Concrete

a. 1:1:2
b. 1:2:4
c. 1:1.5:3
d. 1:2.5:5

19. Which is true regarding Water Cement Ratio

a. Strength is directly proportional to w/c ratio
b. W/C ratio only affects workability, not strength
c. High w/c ratio increases durability
d. None of them

20. Workability of concrete is inversely proportional to

a. Aggregate Grading
b. Water Aggregate Ratio
c. Aggregate Cement Ratio
d. Water Cement Ratio

21. Friction of Concrete components is reduced by

a. Angular Aggregates
b. Flaky Aggregates
c. Rounded Aggregates
d. Porous Aggregates

22. Curing is essential to avoid
A) Cracking
B) Premature Drying
C) Shrinkage

a. All of them are correct
b. B and C are wrong
c. A and C are correct
d. A and B are correct

23. Water Quality affects
A) Hydration Process
B) Aggregate Density
C) Aggregate Grading

a. All of them are correct
b. B and C are wrong
c. A and C are correct
d. A and B are correct

24. Cold weather concreting is defined when?

a. Water temperature is below 10 degrees Celcius
b. Air temperature is below 5 degrees Celcius
c. Air temperature is below 10 degrees Celcius
d. Water temperature is below 5 degrees Celcius

25. Which is more reliable and accurate?

a. Weight Batching
b. Volume Batching
c. Either of them
d. None of them

26. Poor compaction leads to

a. Segregation
b. Cracking
c. Honey Combing
d. All of them

27. Concrete is not advantageous in

a. Mass concreting
b. RCC Structures
c. Shear Wall
d. None of them

28. 45 degree rule is related to

a. Cone Penetration Test
b. Cube Compression Test
c. Non-Destructive Testing
d. Slump Cone Test

29. Repair Technique for fine cracks

a. Cement Mortar Injection
b. Painting
c. Epoxy Injection
d. Grouting

30. For stronger Concrete use more

a. Water
b. Compaction
c. Cement
d. Fine Aggregate

31. Surveying principle states

a. Work from part to the whole
b. Work from bench mark
c. Work from predetermined positions
d. Work from whole to the part

32. Direct measurement can be done using

a. Chain
b. Compass
c. Theodolite
d. All of them

33. Chain Surveying is done

a. In plain terrains
b. Using well-conditioned triangles
c. Using perpendicular offsets
d. All of them

34. Sag in Chain causes

a. Decrease in Length
b. Increase in Length
c. Decrease in Slope
d. Both b and c

35. Prismatic Compass measures

a. Reduced Bearing
b. End Bearing
c. Whole Circle Bearing
d. Both b and c

36. With a series of connected lines what all shall be measured?

a. Angle
b. Bearing
c. Length
d. Both b and c

37. Fore bearing and Back bearing differ by

a. Pi radians
b. 180 degrees
c. Both a and b
d. 360 degrees

38. Plane Table surveying involves use of

a. Compass
b. Cross staff
c. Alidade
d. Arrows

39. Longitudinal axis of the telescope is inclined by 30 degrees positioned at a height of 1.75 m in station A from the reduced level of 120 m.

At an inclined distance of 130 m apart, the reading in the levelling staff held vertical positioned at station B is 1.55 m. What is the RL of the station B?

a. 175.87 m
b. 185.20 m
c. 195.26 m
d. 155.65 m

40. Theodolite directly measures

a. Angles
b. Bearings
c. Distance
d. Both a and b

41. Contour lines are

a. Lines joining points of same elevation
b. Lines joining points of same bearing
c. Both a and b
d. None of them

42. A levelling operation was carried out between benchmark station A and station B.

The Reduced Level (RL) of benchmark A is 110.000 m and the RL of station B is 115.000 m.

During the levelling work, the following staff readings were observed:

Back sights: 2.500 m at A, 3.200 m at Change Point 1 (CP1), and 2.850 m at Change Point 2 (CP2).

Intermediate sights: 1.650 m, 2.100 m, 1.250 m, 0.950 m, 1.100 m, and 0.750 m.

Fore sights: 1.850 m at CP1, unknown at CP2, and 1.600 m at B.

Determine the missing foresight reading at CP2.

a. 1.250 m
b. 0.920 m
c. 0.100 m
d. 0.300 m

43. Two straight roads intersect at an angle of $90°$. A simple circular curve of radius 70 m is to be provided to connect the roads. Determine the length of the curve.

a. 100 m
b. 110 m
c. 120 m
d. 130 m

44. In tachometric surveying, neglecting the effect of vertical angle while calculating horizontal distance for inclined sights can lead to significant errors in the computed distance and elevation.

a. True
b. False
c. Only affects staff intercept
d. Only affects instrument constant

45. In most economical earthwork excavation

a. Volume of Excavation should be within Volume of Filling
b. Volume of Excavation should replace Volume of Filling
c. Volume of Filling should be within Volume of Excavation
d. None of them

46. Soil mass is a

a. Solid + Liquid + Air
b. Solid + Fluid
c. Solid + Liquid
d. Both a and b

47. The degree of saturation of a soil sample is 50% and the water content is 20%. If the specific gravity of soil solids is 2.5, determine the porosity of the soil sample.

a. 20 %
b. 50 %
c. 25 %
d. 60 %

48. The specific gravity of clayey soil will be

a. 2.2
b. 2.4
c. 2.7
d. 3.5

49. Atterberg's limits are used to determine:

a. The consistency and plasticity characteristics of fine-grained soils
b. The compaction and consolidation properties of granular soils
c. The shear strength and permeability characteristics of coarse-grained soils
d. The bearing capacity and density index of cohesionless soils

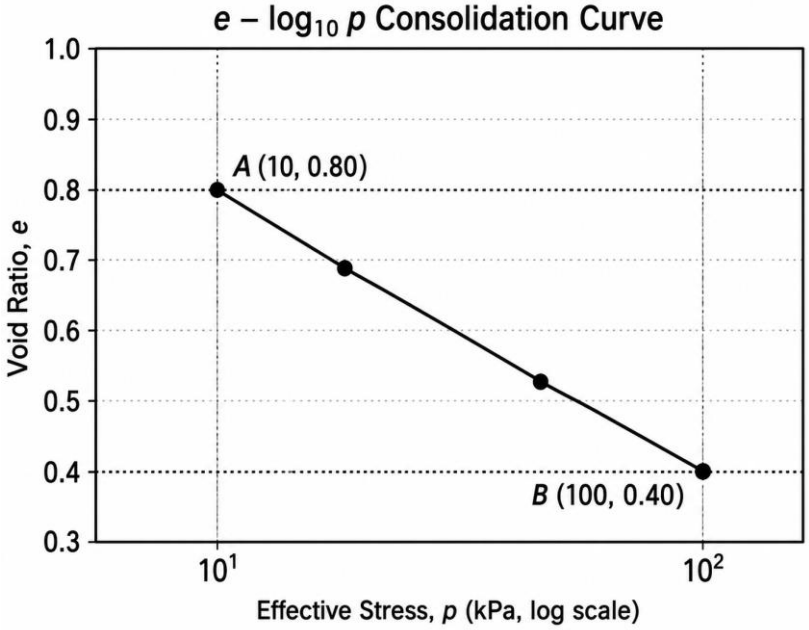
50. A constant head permeability test was conducted on a soil sample of length 10 cm and cross-sectional area 50 cm^2. Under a constant head difference of 20 cm, 1000 cm^3 of water was collected in 100 seconds. Determine the coefficient of permeability of the soil.

a. 0.15 cm/s
b. 1.5 mm/s
c. Both a and b
d. 1 mm/s

51. Which of the following combinations is correct?
    A) An unconfined aquifer has its upper surface open to atmospheric pressure with or without permeable soil.
    B) Water in a confined aquifer is under pressure greater than atmospheric pressure.
    C) A confined aquifer is always located above rock strata.

    a. A and B only
    b. A and C only
    c. B and C only
    d. All of A, B, C

52. Determine Compression Index



    a. 0.1
    b. 0.2
    c. 0.3
    d. 0.4

53. Which of the following combinations is correct?
    A) Maximum Dry Density is the maximum unit weight obtained by compaction at a minimum moisture content.
    B) Optimum Moisture Content is the water content at which the soil attains maximum dry density.
    C) Increasing moisture content beyond the Optimum Moisture Content may sometime increases dry density.

    a. A and B only
    b. A only
    c. B only
    d. All of A, B, C

54. Which of the following combinations is correct?
    A) Rankine's earth pressure theory considers wall friction between the soil and retaining wall.
    B) Coulomb's earth pressure theory assumes that the back of the retaining wall is perfectly smooth.
    C) Passive earth pressure is greater than active earth pressure for the same soil condition.

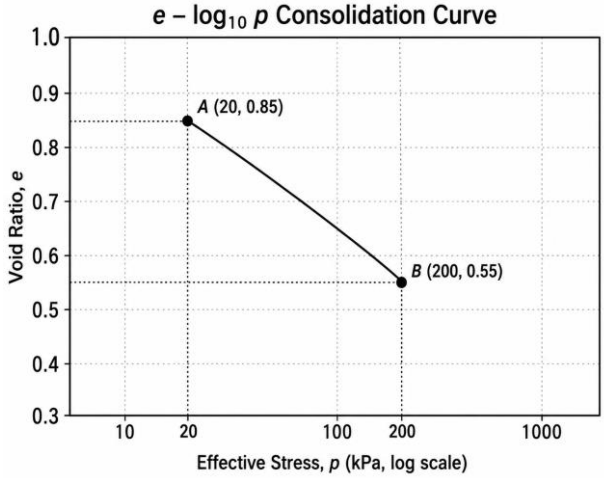
    a. A only
    b. B only
    c. C only
    d. A and C only

55. Which of the following combinations is correct?

A) An SPT N-value less than 4 generally indicates dense sand or stiff clay.
B) An SPT N-value greater than 50 is generally considered as refusal.
C) Higher N-values generally indicate greater soil density and strength.

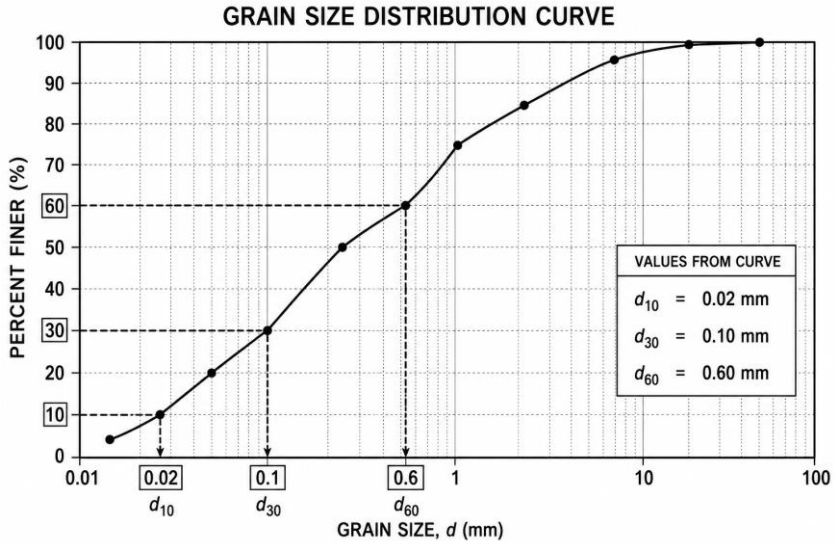
a. A and B only
b. B and C only
c. A and C only
d. All of A, B, C

56. If initial clay thickness in 3.70 m, determine ultimate settlement.



a. 6 mm
b. 60 mm
c. 600 mm
d. None of them

57. Determine Coefficient of Uniformity



a. 5
b. 30
c. 6
d. 36

58. Consider the following statements

a. Quick sand condition occurs only in completely dry soils.
b. Quick sand condition increases the shear strength of soil.
c. During quick sand condition, the effective stress in soil becomes zero.
d. None of them are correct

59. A soil sample has a bulk density of 18 kN/m^3 and a water content of 20%. Determine the dry density of the soil sample in kN/m^3.

a. 12
b. 15
c. 18
d. 21

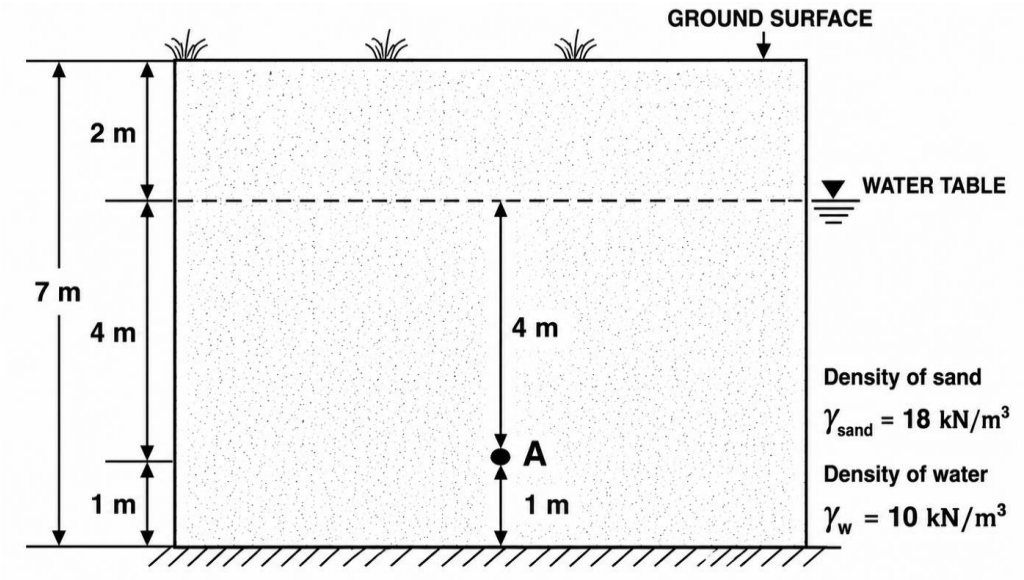
60. A saturated soil sample has a saturated density of 20 kN/m^3 and a water content of 25%. Determine the dry density of the soil sample in kN/m^3.

a. 12
b. 14
c. 16
d. 18

61. How to determine Shear strength of soil in laboratory?

a. Direct Shear Test
b. Vane Shear Test
c. Triaxial Compressive Test
d. All of them

62.



Determine effective stress at A.

a. 62 kPa
b. 64 kPa
c. 66 kPa
d. 68 kPa

63. Confined Aquifer is confined between two

a. Rock strata
b. Impermeable strata
c. Low permeable strata
d. All of them

64. For partially saturated soil, the Degree of Saturation is exactly

a. 50 %
b. 100 %
c. 0%
d. None of them

65. Based on Origin, Soil is classified as

a. Residual Soil and Non-Residual Soil
b. Residual Soil and Transported Soil
c. Cohesive Soil and Cohesionless Soil
d. None of them

66. An RCC slab is supported on all four sides. The longer span is 6 m and shorter span is 3 m. The slab is

a. One way slab
b. Two way slab
c. Two way slab with corners held down
d. Two way slab with corners not held down

67. A reinforced concrete column carries an axial load of 600 kN. If the safe bearing capacity of soil is 200 kN/m^2, determine the required area of isolated footing in m^2.

a. 1
b. 2
c. 3
d. 4

68. A water tank wall is subjected to water pressure increasing linearly with depth. If the water depth is doubled, How the pressure at the bottom will be?

a. Half
b. Double
c. Unchanged
d. Unpredictable

69. A steel roof truss carries a total load of 120 kN equally shared by two supports. Determine the reaction at each support in kN.

a. 30
b. 45
c. 60
d. 90

70. In a simply supported RCC beam carrying a uniformly distributed load, if the span of the beam is doubled while the load per meter remains constant, the maximum bending moment becomes

a. Unchanged
b. Double
c. Three times
d. Four times

71. If the allowable soil bearing capacity decreases for the same column load, the required footing area will be

a. Increased
b. Decreased
c. unchanged
d. Half

72. An RCC beam designed by Working Stress Method is subjected to a tensile stress of 6 N/mm^2. If the cracking stress of concrete is 5 N/mm^2, determine whether the beam will crack.

a. Beam will not Crack
b. Beam will be Over Reinforced
c. Beam will crack
d. Beam will be Under Reinforced

73. Cracking stress of M25 grade concrete RCC bending member in MPa.

a. 2.5
b. 3
c. 3.5
d. 4

74. A reinforced concrete column has an unsupported length of 4 m. Both ends of the column are hinged.
Determine the effective length of the column in m.

a. 2
b. 6
c. 8
d. None of the above

75. Which of the following combinations is correct?
A) A doubly reinforced beam contains reinforcement in both tension and compression zones.
B) Doubly reinforced beams are preferred when beam depth is restricted.
C) Compression reinforcement in a doubly reinforced beam does not contribute to moment of resistance.

a. A and B only
b. B and C only
c. A and C only
d. All of A, B, C

76. Which of the following is correct?

a. A flat slab is directly supported on beams.
b. Flat slabs are unsuitable for buildings requiring large unobstructed floor space.
c. Drop panels are provided in flat slabs to increase shear resistance near columns.
d. All of them

77. Failures which are not purely due to bending moment

a. Shear Failure
b. Buckling Failure
c. Fatigue Failure
d. All of them

78. A doubly reinforced RCC beam is required to resist an additional moment of 36 kN m. The effective cover to compression steel is 50 mm, effective depth is 350 mm, and permissible stress in compression steel is 120 N/mm^2.
Determine the area of compression reinforcement A_{sc} in mm^2.

a. 100
b. 200
c. 1000
d. 2000

79. A simply supported two-way RCC slab of size 4 m $\times$ 4 m with M20 grade concrete and tensile reinforcement of 100 mm^2/m Determine the suitable reinforcement arrangement if the spacing of bars is fixed at 200 mm c/c. Consider all code provisions as per IS 456:2000.
Consider,
Area of 6 mm bar $= 28$ mm^2
Area of 8 mm bar $= 50$ mm^2
Area of 10 mm bar $= 80$ mm^2
Area of 12 mm bar $= 113$ mm^2

a. 6 mm dia bars @ 200 mm c/c
b. 8 mm dia bars @ 200 mm c/c
c. 10 mm dia bars @ 200 mm c/c
d. 12 mm dia bars @ 200 mm c/c

80. Which of the following combinations is correct?
A) Water tanks are generally designed using Working Stress Method.
B) Crack control is important in water retaining structures.
C) LSM is always not preferred since it permits cracks in tension zone.
D) Water tanks should be designed to ensure water tightness.
E) Tensile stress in concrete is kept within permissible limits in WSM.
F) Water tank walls are subjected to hydrostatic pressure.

a. A, B, C, D and F only
b. A, B, D, E and F only
c. A, C, D, E and F only
d. All of A, B, C, D, E and F

81. A dog-legged staircase is provided between two floors having a floor-to-floor height of 3.6 m. The staircase consists of two equal flights. The rise of each step is 150 mm, and the tread is 300 mm. Determine the total horizontal distance covered by one flight of the staircase in m.

a. 3
b. 3.3
c. 3.6
d. 4

82. An RCC lintel of effective span 3 mcarries a uniformly distributed load of 8 kN/m, including self-weight. The permissible bending stress in concrete is 5 N/mm^2. Determine the section modulus required for the lintel in m^3.

a. 0.0003
b. 0.0009
c. 0.0018
d. 0.0036

83. As per IS 456:2000, the design bond stress (τ_{bd}) for plain bars in tension for M20 concrete is 1.2 MPa. If deformed bars are used in tension, deformed bars in compression, plain bars in compression, then the design bond stress in MPa will be

a. 1.92, 2.40, and 1.50
b. 1.92, 1.50, and 2.40
c. 1.50, 1.92, and 2.40
d. 2.40, 1.92, and 1.50

84. In earthquake-prone zones, reinforced brickwork is preferred because it provides

a. More Hardness
b. Lighter Weight
c. Deformation without sudden failure
d. All of them

85. Which of the following combinations is correct?
    A) WSM is based on elastic theory, while LSM considers inelastic behaviour at ultimate loads.
    B) LSM uses a single Factor of Safety applied to working loads, whereas WSM uses partial safety factors.
    C) LSM checks both ultimate limit state (strength) and serviceability limit state (deflection/cracking).
    D) WSM is more suitable for brittle materials, and LSM applies only to ductile materials like steel.
    E) In WSM, stresses under working loads are kept within permissible limits, but collapse load is not directly checked.
    F) LSM uses partial safety factors that are always less than 1.0, resulting in lower overall safety.

    a. A, B, C are correct
    b. A, C, E are correct
    c. B, D, F are correct
    d. D, E, F are correct

86. In estimation, the method in which the total length of walls at the center line is considered for quantity calculation is known as

    a. Mid-section method
    b. Simpson's rule
    c. Center line method
    d. Trapezoidal rule

87. The standard size of non-modular brick as per Indian practice is

    a. 19×9×9 cm
    b. 23x11x7 cm
    c. 20×10×10 cm
    d. 22x10x8 cm

88. Which of the following combinations is correct?
    A) Market value depends on demand and supply.
    B) Book value decreases with depreciation.
    C) Sinking fund is created for future replacement.

    a. A and B only
    b. B and C only
    c. A and C only
    d. All of A, B, C

89. Which of the following combinations is correct?
    A) Depreciation represents reduction in value with age.
    B) Obsolescence may cause depreciation.
    C) Scrap value is always greater than original cost.

    a. A and B only
    b. B and C only
    c. A and C only
    d. All of A, B, C

90. In valuation, the amount obtained after dismantling a structure and selling the materials is known as

    a. Market value
    b. Assessed value
    c. Capital value
    d. Salvage value

91. Which of the following combinations is correct?
    A) Measurement Book is a permanent record of measurements.
    B) Measurement Book can be destroyed immediately after payment.
    C) It forms the basis for payment to contractors.

    a. A and B only
    b. B and C only
    c. A and C only
    d. All of A, B, C

92. Which of the following combinations is correct?
    A) Plinth area is the covered built-up area measured at floor level.
    B) Carpet area includes the thickness of walls.
    C) Salvage value is the value obtained after dismantling the structure.
    D) Depreciation is the increase in value of a structure with age.

    a. A and B only
    b. B and C only
    c. A and C only
    d. All of A, B, C

93. The cross-sectional areas of an embankment at five consecutive sections 20 m apart are 20 m^2, 30 m^2, 40 m^2, 50 m^2, 60 m^2. Determine the volume of earthwork in m^3 using Trapezoidal formula.

    a. 2400
    b. 3200
    c. 3600
    d. 4200

94. The cross-sectional areas of an embankment at five consecutive sections 20 m apart are 20 m^2, 30 m^2, 40 m^2, 50 m^2, 60 m^2. Determine the volume of earthwork in m^3 using Simpson's formula.

    a. 2400
    b. 3200
    c. 3600
    d. 4200

95. A septic tank construction consists of 10 m^3 brick masonry work. The rate of brick masonry is ₹4000 per m^3. The plastering and miscellaneous charges are estimated as 25% of the brickwork cost. Determine the total estimated cost of the septic tank in Rupees.

    a. 40,000
    b. 45,000
    c. 50,000
    d. 55,000

96. A rectangular room has outer dimensions 6 m $\times$ 4 m. The thickness of all walls is 0.30 m, and the height of wall is 3 m. Determine the quantity of brickwork in m^2 using Centre Line Method.

    a. 16.92
    b. 18.56
    c. 17.63
    d. 20.12

97. In analysis of rates for brick masonry, the labour cost is estimated as 40% of the material cost. If the material cost for a work is Rs. $24{,}000$, and overhead charges are 10% of the subtotal of material and labour cost, determine the total cost of work in Rupees.

a. 33640
b. 36960
c. 42600
d. 54360

98. A beam requires 4steel bars each of length 5 m. The unit weight of steel bar is 2 kg/m. An additional 10% length is provided for hooks and bends. Determine the total weight of steel in kg required in the Bar Bending Schedule.

a. 40
b. 42
c. 44
d. 46

99. A reinforced concrete beam requires 6main bars of 16 mm diameter. The clear length of beam is 4 m. Each bar has two hooks of 200 mm length. The unit weight of 16 mm diameter bar is 1.6 kg/m. Determine the total weight of steel in kg required for the main reinforcement in the Bar Bending Schedule.

a. 42.24
b. 44.26
c. 48.62
d. 54.28

100. A flexible pavement of width 5 m and length 200 m consists of:
Sub-base course costing Rs. $400/\text{m}^2$
Base course costing Rs. $600/\text{m}^2$
Wearing course costing Rs. $1000/\text{m}^2$
Labour and rolling charges are estimated as 25% of the total pavement layer cost.
Contractor's profit is 10% of the subtotal.
Determine the total estimated cost of the flexible pavement in Rupees.

a. 13,70,000
b. 18,50,000
c. 24,30,000
d. 27,50,000