B

PUBLIC WORKS DEPARTMENT

DEPARTMENTAL EXAMINATION OF SECTION ASSISTANT (S.A.) UNDER P.W.D., 2024

ENGINEERING PAPER

(100 MARKS)

Signature of Invigilator _____

CODE NO.
(For Official use)

MARK TABULATION			
Question No.	Marks carried by each question	No. of correct answers	Marks
1-100	1		

Signature of Examiner_____

Signature of Scrutiniser _____

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Roll No. _____

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Time allowed : 3 hours **Full Marks : 100**

Pass Marks : 40

Choose the correct answer (Each question carries 1 mark)
(Put a tick mark (✓) against the correct answer in the bracket ( )

1. While measuring cutting down of trees, girth shall be measured at:-
   (a) 1 m above ground level ( ) (b) 1.2 m above level ( )
   (c) 1.5 m above ground level ( ) (d) 1.8 m above ground level ( )

2. A 12m long 12mm dia bar would weight:-
   (a) 8.0 Kg ( ) (b) 9.5Kg ( )
   (c) 10.6Kg ( ) (d) 12.0 Kg ( )

3. Volume of one bag (50 Kg) of cement may be taken as:-
   (a) $0.000035m^3$ ( ) (b) $0.00035m^3$ ( )
   (c) $0.0035m^3$ ( ) (d) $0.035m^3$ ( )

4. Using usual notation, quantity of frustrum of pyramid portion of the foundation footing is calculated as:-
   (a) $h/6(A_1+A_2+2Am)$ ( ) (b) $h/6\ (A_1+A_2+4Am)$ ( )
   (c) $h/8(A_1+A_2+2Am)$ ( ) (d) $h/8(A_1+A_2+4Am)$ ( )

5. The unit of measurement of half brick work is:-
   (a) Rm ( ) (b) m^2 ( )
   (c) m^3 ( ) (d) Nos ( )

6. A tap with an horizontal inlet and a nozzle bent to discharge in a downward direction is:-
   (a) Baffles ( ) (b) Bell mouth ( )
   (c) Elbow ( ) (d) Bib tap ( )

7. The system of plumbing in which the waste connection from sinks, baths, work basins and the soil pipes branches are all collected into one main pipeline trap ventilation is called:-
   (a) One-pipe system ( ) (b) Two-pipe system ( )
   (c) Single stack system ( ) (d) None of (A), (B) & (C) ( )

8. A white colour plastic type of pipe used in many cold-water plumbing application is:-
   (a) CPVC ( ) (b) UPVC ( )
   (c) PVC ( ) (d) PE ( )

9. A depressed or bent fittings in Building sanitary works which prevent foul air or gas to pass through it are called:-
   (a) Soil pipes ( ) (b) Traps ( )
   (c) Floats ( ) (d) Valves ( )

10. A covered pit dug generally in the pervious soil which can absorb sewage effluent or discharges is:-

(a) Flushing cisterns ( ) (b) Water closets ( )

(c) Septic tank ( ) (d) Sock Pit ( )

11. The rise of Jack Arch floor is kept equal to:-

(a) $1/10^{th}$ of the span ( ) (b) $1/12^{th}$ of the span ( )

(c) $1/14^{th}$ of the span ( ) (d) $1/16^{th}$ of the span ( )

12. What is the meaning of 12-16Øin structural drawing?

(a) 12 Nos of 16 mm dia bars ( )

(b) 12 mm dia bar16 mm centre to centre ( )

(c) Provide bar of 12 mm dia to 16 mm dia ( )

(d) Mixing of 12mm & 16mm dia bar ( )

13. A dots or dashes in Architectural drawings indicate:-

(a) Discontinuous members ( )

(b) Something which is not solid ( )

(c) Small openings ( )

(d) Something hidden from View Angle ( )

14. Which of the following information is typically not available in structural drawings:-

(a) Spacing of re-enforcement ( )

(b) Cross sectional detail of doors ( )

(c) Effective cover to re-enforcement ( )

(d) None of (A), (B) & (C) ( )

15. Which of the following information is typically not available in Architecture drawings:-

(a) Development length ( )

(b) Recommended foundation dept ( )

(c) Landscaping ( )

(d) Space utilization management ( )

16. Which one of the following Indian standard rolled steel section is an I-Section?

(a) ISHT ( ) (b) ISLC ( )

(c) ISJB ( ) (d) ISMC ( )

17. Choose an equal angle section from the followings:-

(a) ISA 75 X 76 X 8mm ( ) (b) ISA 110 X 110 X 16mm ( )

(c) ISA 45 X 30 X 5mm ( ) (d) ISA 125 X 75 X 10mm ( )

18. An Indian Standard Channel section MC 200 means:-

(a) Medium weight channel of dept 200 mm ( )

(b) Medium weight channel of 200 Kg ( )

(c) Medium weight channel of thickness 200mm ( )

(d) Medium weight channel of length 200mm ( )

19. The upright member added to strengthen the Queen post truss is:-

(a) Strut ( ) (b) Tie beam ( )

(c) Straining beam ( ) (d) Princess Post ( )

20. A timber board used to hold the common rafter forming verge is:-

(a) Eaves board ( ) (b) Barge board ( )

(c) Ridge ( ) (d) Jack rafters ( )

21. The maximum water-cement ratio for structural purpose cement concrete is:-

(a) 0.45 ( ) (b) 0.50 ( )

(c) 0.55 ( ) (d) 0.60 ( )

22. The maximum spacing of main steel in RCC slab is:-

(a) 300 mm ( ) (b) 350mm ( )

(c) 400mm ( ) (d) 450mm ( )

23. Providing proper cover to re-enforcement in RCC members will ensure:-

(a) Tensile strength ( ) (b) Durability ( )

(c) Deflection condition ( ) (d) Lateral Stability ( )

24. The wedge-shape unit fixed at the crown of an Arch is:-

(a) Key ( ) (b) Soffit ( )

(c) Springer ( ) (d) Rise ( )

25. The minimum strength of concrete for structural purpose is:-

(a) M15 ( ) (b) M20 ( )

(c) M25 ( ) (d) M30 ( )

26. Which of the following is a shallow type of foundation?

(a) Caissons ( ) (b) Pier foundation ( )

(c) Pile foundation ( ) (d) Strap footings ( )

27. The most suitable foundation for bridge pier among the following is:-

(a) Combined footing ( ) (b) Mat foundation ( )

(c) Well foundation ( ) (d) Spread foundation ( )

28. Which of the following is cohesionless by soil?

(a) Sand ( ) (b) Silt ( )

(c) Clay ( ) (d) Silty Peat ( )

29. The type of door permitting free ventilation but at the same time can maintain privacy is:-

(a) Wire-Gauged Door ( ) (b) Flight Doors ( )

(c) Louvered Door ( ) (d) Batten and ledge door ( )

30. The vertical outside member of the shutter of a door or window is called:-

(a) Sill ( ) (b) Head ( )

(c) Strut ( ) (d) Style ( )

31. The dimension in 'mm' for A3 size drawing Sheet is:-

(a) 841 X 1189 ( ) (b) 297X420 ( )

(c) C) 420 X 594 ( ) (d) 210 X 297 ( )

32. Which one of the followings is an enlargement scale?

(a) 1.2000 ( ) (b) 1.2 ( )

(c) 1.1 ( ) (d) 50:1 ( )

33. The type of line recommended to be used for dimension lines in Building Drawing is:-

(a) Continuous Thin ( ) (b) Continuous Thick ( )

(c) Dashed Thin ( ) (d) Dashed Thick ( )

34. The angular measurement is given by:-

(a) Chains ( ) (b) Compass ( )

(c) Theodolites ( ) (d) Both (B) & (C) ( )

35. If the representative factor in a drawing is 1/30000, then, 6Km long will be represented by:-

(a) 10 cm ( ) (b) 15 cm ( )

(c) 20 cm ( ) (d) 30 cm ( )

36. Thickness of partition walls of Building may be seen from:-

(a) Plan ( ) (b) Elevation ( )

(c) Section ( ) (d) Both (A) & (C) ( )

37. Drawing for Buildings started with:-

(a) Detail Elevation ( ) (b) Plan ( )

(c) Sectional Drawing at different locations ( ) (d) All of (A), (B) & (C) ( )

38. In which of the following, you will show cross section detail of lintel over windows/Doors?

(a) Plan ( ) (b) Elevation ( )

(c) Section ( ) (d) All of (A), (B) & (C) ( )

39. The overburnt bricks with irregular shape and dark colour should be classed as:-

(a) First class ( ) (b) Second class ( )

(c) Third class ( ) (d) Fourth class ( )

40. Each Bitumen Emulsion drum shall be legibly and indelibly marked with:-

(a) Source, month and year of manufacture ( ) (b) Type/Grade and Batch number ( )

(c) Date of Expiry ( ) (d) All of (A), (B) and (C) ( )

41. Which of the following type of roof would be most suitable for Verandah roofing?

(a) Hip roof ( ) (b) Deck roof ( )

(c) Gable roof ( ) (d) Lean-to-roof ( )

42. To fix GI sheet roofing , a hole must be drilled at:-

(a) The crown ( ) (b) The valley ( )

(c) Mid-point of crown and valley ( ) (d) Always closure to the valley ( )

43. The overall width of GI sheet roofing is:-

(a) 1.0 m ( ) (b) 1.01 m ( )

(c) 1.05 m ( ) (d) 1.10 m ( )

44. Choose the wrong statement:-

(a) SOR includes 10% Contractor's profit ( )

(b) SOR can be made up-to- date using cost index ( )

(c) SOR must always carry year of publication ( )

(d) SOR must be the same all over the state. ( )

45. Requirement for the preparation of SOR is:-

(a) Rate analysis ( ) (b) Deviation Statement ( )

(c) Expenditure statement ( ) (d) All of (A), (B) & (C) ( )

46. The Current Cost Index for MPWD SOR 2019 (Building wells) is:-

(a) 26.13% ( ) (b) 27.12% ( )

(c) 26.33% ( ) (d)27.33% ( )

47. Choose which of the following is required for analysis of rates of an item:-

(a) Quantity of Material ( ) (b) Number of labourers needed ( )

(c) Over heads ( ) (d) All of (A), (B) & (C) ( )

48. The basic rate of materials are inclusive of :-

(a) Contractors profit ( ) (b) Royalty, Taxes etc. ( )

(c) Overheads ( ) (d) Carriage ( )

49. Rocks or boulders which way is quarried or split with crow bars is classified as:-

(a) Hard Rock (Requiring blasting) ( )

(b) Hard Rock (Blasting Prohibited) ( )

(c) Soft/Disintegrated rocks (not requiring blasting) ( )

(d) Hard/Dense soil ( )

50. Excavation upto 1.5m dept below ground level and depositing excavated-material on the ground which is included in the item of earthwork for various kinds of soil is:-

(a) Lead ( ) (b) Lift ( )

(c) Lead & Lift ( ) (d) Planking and Strutting ( )

51. The expenditure provided for sundries in analysis of rate in general is:-

(a)1% of total rate of item ( ) (b) 1.5% of total rate of item ( )

(c) 2% of total rate of item ( ) (d) 2.5% of total rate of item ( )

52. Choose the factor(S) affecting rate of item from the following:-

(a) Specification of item ( ) (b) Transportation of material ( )

(c) Labour wages ( ) (d) All of (A), (B) & (C) ( )

53. Choose labour required for rate analysis of mild steel re-enforcement for RCC work:-

(a) Mason ( ) (b) Mate ( )

(c) Blacksmith ( ) (d) Painter ( )

54. The unit for wood work in frames of doors, windows etc., is:-

(a) Rm ( ) (b) m^3 ( )

(c) m^2 ( ) (d) Each ( )

55. Weight of round bars in Kg/m may be calculated as, where D is diameter in 'mm':-

(a) $(D)^2/162$ ( ) (b) D/162 ( )

(c) $D^2/169$ ( ) (d) D/169 ( )

56. The requirement of cement for 1 cum of M20 grade cement concrete may be taken, for rate analysis purpose as:-

(a) 6.0 bags ( ) (b) 6.4 bags ( )

(c) 8.0 bags ( ) (d) 8.4 bags ( )

57. Cost of labour component of an item in building work for rough estimation purpose is:-

(a) 30 to 35% of total cost ( ) (b) 65 to 70% of total cost ( )

(c) 80 to 85 percent total cost ( ) (d) 90 to 95% of total cost ( )

58. The number of Brick requirement per sq.mt of Plinth area is:-

(a) 450 nos ( ) (b) 500 nos ( )

(c) 550 nos ( ) (b) 600 nos ( )

59. The unit of measurement for scarifying in road work is:-

(a) Rm ( ) (b) m^2 ( )

(c) m^3 ( ) (d) Nos ( )

60. The Rankine's formula for calculations of thickness of arch in arch culvert is:-

(a) T=0.01R ( ) (b) T=0.012R ( )

(c) T=0.1R ( ) (d) T=0.12R ( )

61. In the process of preparation of dry soil sample for various tests, soil samples as received from the field shall be dried:-

(a) In the air or sun ( ) (b) Always in drying apparatus ( )

(c) By heating in a pan ( ) (d) by blowing air ( )

62. By rolling or tamping , compaction is carried out in soil due to removal of:-

(a) Water ( ) (b) Air ( )

(c) Deleterious material ( ) (d) Organic material ( )

63. A soil which is sticky when wet and become powder when dry is:-

(a) Gravels ( ) (b) Sand ( )

(c) Silt ( ) (d) Clay ( )

64. Liquid limit and plastic limit of soil depends on:-

(a) Clay content ( ) (b) Silt content ( )

(c) Sand content ( ) (d) All of (A), (B) & (C) ( )

65. The soil having the range of particle size less than 0.002mm is:-

(a) Fine sand ( ) (b) Fine silt ( )

(c) Medium silt ( ) (d) Clay ( )

66. The mix design method used for Rigid concrete pavement is:-

(a) Hubbard-Field Method ( ) (b) Hveem mix design method ( )

(c) Marshall mix design method ( ) (d) None of (A), (B) & (C) ( )

67. If there is a blue smoke from the bituminous mix during laying operating it indicates:-

(a) High moisture content ( ) (b) Overheating of mix ( )

(c) High binder content ( ) (d) Excessive fines ( )

68. Tack coat is applied in the construction of flexible pavement:-

(a) To make bituminous layers functions as one ( )

(b) to coat and stabilised loose unbound layer ( )

(c) To protect the base course surface from wet weather ( )

(d) To harden the base course so as to avoid potential damage from construction equipment ( )

69. The process of application of proper grade of paving bitumen or RS cationic emulsion to a previously prepared surface followed by application of cover aggregate and well rolled is:-

(a) Pre-mix competing ( ) (b) Mix seal surfacing ( )

(c) Seal coating ( ) (d) surface dressing ( )

70. A smooth pavement surface having a very low skid resistance is primary due to:-

(a) Non-uniform application of Bitumen ( )

(b) Loss of cover aggregates in surface dressing ( )

(c) Polishing of aggregates under traffic ( )

(d) Excessive prime coat or tack coat ( )

71. The reach of the river at the upstream and downstream for ideal location of Bridge site should be:-

(a) Curve ( ) (b) Zig-zag ( )

(c) Straight ( ) (d) None of (A), (B) & (C) ( )

72. The overall cost of bridge can be reduced if the river channel at the proposed bridge site is:-

(a) Narrow ( ) (b) Wide ( )

(c) Low height ( ) (d) Gentle slope ( )

73. Which of the following is not hill roads:-

(a) NH ( ) (b) SH ( )

(c) ODR ( ) (d) None of (A), (B) & (C) ( )

74. The desirable road land width for village roads in built up area is:-

(a) 9m ( ) (b) 12m ( )

(c) 15m ( ) (d) 24m ( )

75. The maximum permissible super elevation for hill roads not bound by snow is:-

(a) 7% ( ) (b) 10% ( )

(c) 12% ( ) (d) 15% ( )

76. Radius of an existing curve at site may be calculated by:-

(a) Chord/4(offset)^2 ( ) (b) 4 (Chord)^2/offset ( )

(c) (Chord)^2/8offset ( ) (d) 8 Chord/(offset)^2 ( )

77. The minimum radius for inner curve in hair pin bend is:-

(a) 10m ( ) (b) 12m ( )

(c) 14m ( ) (d) 20m ( )

78. Wet sieving method may be done for material which:-

(a) Tend to agglomerate ( ) (b) is very coarse ( )

(c) is very fine ( ) (d) All of (A), (B) & (C) ( )

79. The dry density of soil at site may be determined by:-

(a) Plate load test ( ) (b) Sand replacement method ( )

(c) Standard proctor test ( ) (d) CBR test ( )

80. Which of the following test is used to determine atterbergs limit of soil sample?

(a) Proctor test ( ) (b) SPT ( )

(c) Tri-axial test ( ) (d) Liquid limit test ( )

81. Which of the following is not distance measuring device?

(a) Passometer ( ) (b) Clinometer ( )

(c) Odometer ( ) (d) Pedometer ( )

82. The process of centering a prismatic compass over the station where bearing is to be taken by dropping a small piece of stone is called:-?

(a) Levelling ( ) (b) Observing ( )

(c) Offsetting ( ) (d) Centering ( )

83. The difference between back bearing and fore bearing of a compass in order to eliminate local attraction must be:-

(a) 0^0 ( ) (b) 90^0 ( )

(c) 180^0 ( ) (d) 270^0 ( )

84. The process of temporary adjustment of a theodolite includes:-

(a) Setting up ( ) (b) Levelling up ( )

(c) Elimination of parallax ( ) (d) All of (A), (B) & (C) ( )

85. In survey work of hilly terrain by a method of stepping, tool used to transfer points to the ground is:-

(a) Plumb bob ( ) (b) whites ( )

(c) Laths ( ) (d) Ranging Rods ( )

86. Which of the following will be an obligatory point while surveying road alignment

(a) Bridge site ( ) (b) Intermediate town ( )

(c) Water logged area ( ) (d) All of (A), (B) & (C) ( )

87. Choose the correct sequence of step in surveying of new highway project: -

(a) Reconnaissance survey → Map study → Preliminary survey → Final adjustment ( )

(b) Preliminary survey → Map study → Reconnaissance → Final adjustment ( )

(c) Map study → Reconnaissance → Preliminary survey → Final adjustment ( )

(d) Map study → Preliminary survey → Reconnaissance → Final adjustment ( )

88. The primary operation for formation work in road that provides inspection path for inspection of alignment is:-

(a) Jungle clearance ( ) (b) Trace-cut ( )

(c) Excavation ( ) (d) Blasting ( )

89. Cutting on the hill side on the inner edge of the curve to improve visibility is called:-

(a) Zigs ( ) (b) Ledge ( )

(c) Box cut ( ) (d) Vision berms ( )

90. The minimum stopping sight distance that must be provided for a design speed of 30Km/hr is:-

(a) 30m ( ) (b) 35m ( )

(c) 40m ( ) (d) 45m ( )

91. Which of the following is Disintegration types of deflects in flexible pavement :-

(a) Alligator crack ( ) (b) Ravelling ( )

(c) Cutting ( ) (d) Fatty surfaces ( )

92. The purpose of sub-base course beneath the cement concrete pavements includes:-

a) To provide strong supporting layer ( ) (b) To prevent mud-pumping ( )

(c) To reduce thickness requirement ( ) (d) All of (A), (B) & (C) ( )

93. Tool used to check the finished cement concrete pavement surface in longitudinal direction is:-

(a) Straight edge ( ) (b) Float ( )

(c) Vibrating screed ( ) (d) Canvas Belt ( )

94. Dowel bars are used in rigid pavement to :-

(a) Transfer load between adjacent concrete ( )

(b) Maintain two slabs at the same height ( )

(c) Improve performance of joints ( )

(d) All of (A), (B) & (C) ( )

95. Which of the following is not defect in rigid pavement?

(a) Mud pumping ( ) (b) Corrugations ( )

(c) Spalling ( ) (d) Blowups ( )

96. Choose the one which is not a cross-drainage type of drain:-

(a) Small bridges ( ) (b) Slab culvert ( )

(c) Cause ways ( ) (d) None of (A), (B) & (C) ( )

97. Provision of 1.50 to 1.80m deep drainage channels close to the road gives satisfactory results in road construction :-

(a) In areas where the problem is of water lofting alone ( )

(b) In areas where in addition to water logging, flooding for prolong periods is so expected ( )

(c) In areas where in addition to water logging, harmful salts are present in the sub soil or ground water ( )

(d) None of (A), (B) & (C) ( )

98. The general requirement of number of culverts per kilometre in hill roads is:-

(a) 6 to 8 ( ) (b) 8 to 10 ( )

(c) 10 to 12 ( ) (d) 12 to 14 ( )

99. The shape for catch water drain recommended is:-

(a) V-Shape ( ) (b) U-Shape ( )

(c) Trapezoidal Shape ( ) (d) Parabolic Shape ( )

100. The type of cross drainage structure recommended at a location where there is a shallow non-perennial stream with the expected interruption between 12 hr to 24 hrs would be:-

(a) Vented causeway ( ) (b) culvert ( )

(c) Submersible bridge ( ) (d) Ford ( )