



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)

MARKTABULATION

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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ENGINEERING PAPER

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Roll No. _____

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PUBLIC WORKS DEPARTMENT
DEPARTMENTAL EXAM FOR SECTION ASSISTANT, 2024
ENGINEERING PAPER

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. 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 ()
2. 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 ()
3. The overall width of GI sheet roofing is:-
(a) 1.0 m () (b) 1.01 m ()
(c) 1.05 m () (d) 1.10 m ()
4. 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. ()
5. Requirement for the preparation of SOR is:-
(a) Rate analysis () (b) Deviation Statement ()
(c) Expenditure statement () (d) All of (A), (B) & (C) ()
6. The Current Cost Index for MPWD SOR 2019 (Building wells) is:-
(a) 26.13% () (b) 27.12% ()
(c) 26.33% () (d) 27.33% ()
7. 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) ()
8. The basic rate of materials are inclusive of :-
(a) Contractors profit () (b) Royalty, Taxes etc. ()
(c) Overheads () (d) Carriage ()
9. 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 ()

10. 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 ()
11. 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 ()
12. Which one of the followings is an enlargement scale?
- (a) 1.2000 () (b) 1.2 ()
(c) 1.1 () (d) 50:1 ()
13. 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 ()
14. The angular measurement is given by:-
- (a) Chains () (b) Compass ()
(c) Theodolites () (d) Both (B) & (C) ()
15. 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 ()
16. Thickness of partition walls of Building may be seen from:-
- (a) Plan () (b) Elevation ()
(c) Section () (d) Both (A) & (C) ()
17. Drawing for Buildings started with:-
- (a) Detail Elevation () (b) Plan ()
(c) Sectional Drawing at different locations () (d) All of (A), (B) & (C) ()
18. 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) ()
19. 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 ()
20. 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) ()
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. 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 ()
32. A 12m long 12mm dia bar would weight:-
 (a) 8.0 Kg () (b) 9.5Kg ()
 (c) 10.6Kg () (d) 12.0 Kg ()
33. 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 ()

34. Using usual notation, quantity of frustrum of pyramid portion of the foundation footing is calculated as:-
- (a) $h/6(A_1+A_2+2A_m)$ () (b) $h/6(A_1+A_2+4A_m)$ ()
(c) $h/8(A_1+A_2+2A_m)$ () (d) $h/8(A_1+A_2+4A_m)$ ()
35. The unit of measurement of half brick work is:-
- (a) Rm () (b) m^2 ()
(c) m^3 () (d) Nos ()
36. 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 ()
37. 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) ()
38. A white colour plastic type of pipe used in many cold-water plumbing application is:-
- (a) CPVC () (b) UPVC ()
(c) PVC () (d) PE ()
39. 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 ()
40. 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 ()
41. The rise of Jack Arch floor is kept equal to:-
- (a) $1/10^{\text{th}}$ of the span () (b) $1/12^{\text{th}}$ of the span ()
(c) $1/14^{\text{th}}$ of the span () (d) $1/16^{\text{th}}$ of the span ()
42. What is the meaning of 12-16 \emptyset in structural drawing?
- (a) 12 Nos of 16 mm dia bars ()
(b) 12 mm dia bar 16 mm centre to centre ()
(c) Provide bar of 12 mm dia to 16 mm dia ()
(d) Mixing of 12mm & 16mm dia bar ()
43. 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 ()

44. 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) ()
45. 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 ()
46. Which one of the following Indian standard rolled steel section is an I-Section?
- (a) ISHT () (b) ISLC ()
 (c) ISJB () (d) ISMC ()
47. 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 ()
48. 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 ()
49. The upright member added to strengthen the Queen post truss is:-
- (a) Strut () (b) Tie beam ()
 (c) Straining beam () (d) Princess Post ()
50. A timber board used to hold the common rafter forming verge is:-
- (a) Eaves board () (b) Barge board ()
 (c) Ridge () (d) Jack rafters ()
51. Which of the following is Disintegration types of defects in flexible pavement :-
- (a) Alligator crack () (b) Ravelling ()
 (c) Cutting () (d) Fatty surfaces ()
52. 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) ()
53. 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 ()

54. 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) ()
55. Which of the following is not defect in rigid pavement?
 (a) Mud pumping () (b) Corrugations ()
 (c) Spalling () (d) Blowups ()
56. 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) ()
57. 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) ()
58. 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 ()
59. The shape for catch water drain recommended is:-
 (a) V-Shape () (b) U-Shape ()
 (c) Trapezoidal Shape () (d) Parabolic Shape ()
60. 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 ()
61. Which of the following is not distance measuring device?
 (a) Passometer () (b) Clinometer ()
 (c) Odometer () (d) Pedometer ()
62. 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 ()
63. 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 ()

64. 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) ()
65. 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 ()
66. 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) ()
67. 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 ()
68. 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 ()
69. 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 ()
70. 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 ()
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) $\text{Chord}/4(\text{offset})^2$ () (b) $4(\text{Chord})^2/\text{offset}$ ()
 (c) $(\text{Chord})^2/8\text{offset}$ () (d) $8\text{Chord}/(\text{offset})^2$ ()
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. 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 ()
82. 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) ()
83. Choose labour required for rate analysis of mild steel re-enforcement for RCC work:-
 (a) Mason () (b) Mate ()
 (c) Blacksmith () (d) Painter ()
84. The unit for wood work in frames of doors, windows etc., is:-
 (a) Rm () (b) m^3 ()
 (c) m^2 () (d) Each ()
85. 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) $D/169$ ()

86. 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 | () |
87. 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 | () |
88. The number of Brick requirement per sq.mt of Plinth area is:-
- | | | | |
|-------------|-----|-------------|-----|
| (a) 450 nos | () | (b) 500 nos | () |
| (c) 550 nos | () | (d) 600 nos | () |
89. The unit of measurement for scarifying in road work is:-
- | | | | |
|--------------------|-----|--------------------|-----|
| (a) Rm | () | (b) m ² | () |
| (c) m ³ | () | (d) Nos | () |
90. 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) $T=0.12R$ | () |
91. 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 | () |
92. By rolling or tamping , compaction is carried out in soil due to removal of:-
- | | | | |
|--------------------------|-----|----------------------|-----|
| (a) Water | () | (b) Air | () |
| (c) Deleterious material | () | (d) Organic material | () |
93. A soil which is sticky when wet and become powder when dry is:-
- | | | | |
|-------------|-----|----------|-----|
| (a) Gravels | () | (b) Sand | () |
| (c) Silt | () | (d) Clay | () |
94. Liquid limit and plastic limit of soil depends on:-
- | | | | |
|------------------|-----|---------------------------|-----|
| (a) Clay content | () | (b) Silt content | () |
| (c) Sand content | () | (d) All of (A), (B) & (C) | () |
95. The soil having the range of particle size less than 0.002mm is:-
- | | | | |
|-----------------|-----|---------------|-----|
| (a) Fine sand | () | (b) Fine silt | () |
| (c) Medium silt | () | (d) Clay | () |
96. 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) | () |

97. 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 ()
98. 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 ()
99. 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 ()
100. 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 ()