

# MIZORAM PUBLIC SERVICE COMMISSION

## TECHNICAL COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO THE POST OF JUNIOR ENGINEER UNDER PUBLIC HEALTH ENGINEERING DEPARTMENT, GOVERNMENT OF MIZORAM. JUNE-2019

### CIVIL ENGINEERING

#### PAPER - II

Time Allowed : 2 hours

Full Marks : 150

*Attempt all questions.*

*All questions carry equal marks of two (2) each*

- The main factor to be considered while preparing a detailed estimate is
  - Quantity of materials
  - Availability of materials
  - Transportation of materials
  - All of these
- Brick wall are measured in sq.m if the thickness of the wall is
  - 15cm
  - 20cm
  - 25cm
  - 30cm
- While estimating the quantities for construction of a building, the correct metric unit is
  - Metre for length
  - Cubic metre for area
  - Square metres for volume
  - Litre for capacity
- In the mid-section formula
  - The mean depth is the average of depths of two consecutive sections
  - The area of mid sections is calculated using mean depth
  - The volume of the earth work is calculated by multiplying the mid-section area by the distance between the two original sections
  - All of these
- The measurement is made in square metre in case of
  - Cement concrete in foundation
  - RCC members
  - Hollow concrete block wall
  - None of these
- The excavation exceeding 1.5m in width and 10 sq.m. in plan area with a depth not exceeding 30cm is termed as
  - Excavation
  - Surface excavation
  - Cutting
  - Surface dressing
- The centerline method is specially adopted for estimating
  - Circular buildings
  - Hexagonal buildings
  - Octagonal buildings
  - All of these
- Salvage value is
  - The value of the building at the end of utility period after dismantling
  - The value of the building at the end of utility period without dismantling
  - The value of dismantled materials
  - None of these

9. Depreciation is
- (a) The rate of decrease of the value of a property annually
  - (b) The gradual exhaustion of the usefulness of property
  - (c) The gradual decay of quality of a property
  - (d) All of these
10. Scrap value is
- (a) The value of materials before dismantling
  - (b) The value of materials after dismantling
  - (c) The difference between the original value and the present value
  - (d) The reserved price of the materials
11. The most reliable estimate is
- (a) Preliminary Estimate
  - (b) Detailed Estimate
  - (c) Plinth area estimate
  - (d) Cubical Rate Estimate
12. If the diameter a spherical ball is 7m, its volume is around
- (a) 1432 cu.m
  - (b) 1420 cu.m
  - (c) 1437 cu.m
  - (d) 1429 cu.m
13. The unit of measurement is per kg for the following
- (a) Collapsible gate
  - (b) Rolling shutters
  - (c) Steel roof truss
  - (d) Expanded metal wire netting
14. The plinth area of a building does not include
- (a) Area of walls at floor level
  - (b) Internal shaft for sanitary installation upto 2 sq.m in area
  - (c) Lift and wall including landing
  - (d) Area of cantilevered balcony
15. The cross section for a highway is taken at
- (a) 30m apart
  - (b) Right angle to centerline
  - (c) Intermediate points having abrupt changes in gradient
  - (d) All of the above
16. The traffic forecast period considered in India in highway design is
- (a) 10 years
  - (b) 12 years
  - (c) 15 years
  - (d) 20 years
17. In rigid pavement, arrangements given for tying two slabs together but without transferring the pavement load are
- (a) Wire mesh
  - (b) Tie bars
  - (c) Dowel bars
  - (d) Bars mat
18. A very light application materials to tie an existing bituminous or cement concrete surface, used to ensure a bond between the surface being paved and the overlying course is called
- (a) Prime coat
  - (b) Tack coat
  - (c) Seal coat
  - (d) Bituminous surface

19. In Indian practice of traffic signal, the amber period of transition interval between green and red signal is
- (a) 1 second (b) 1.5 second  
(c) 2 seconds (d) 2.5 seconds
20. Minimum thickness for rigid pavement is
- (a) 150mm (b) 125mm  
(c) 175mm (d) 65mm
21. Surveys which are carried out to depict mountains, rivers, water bodies, wooded areas and other cultural details are known as
- (a) Cadastral surveys (b) City surveys  
(c) Topographical surveys (d) Guide map surveys
22. Which of the following scales is the largest one
- (a) 1cm = 50m (b) 1:42000  
(c) RF= 1/300000 (d) 1cm = 5km
23. The principle of working from 'whole to part' is used in surveying because
- (a) Plotting becomes easy (b) Survey work can be completed easily  
(c) Accumulation or errors is prevented (d) All of the above
24. Local attraction in compass surveying may exist due to
- (a) Incorrect leveling of the magnetic needle  
(b) Loss of magnetism of the needle  
(c) Friction of needle at the pivot  
(d) Presence of magnetic substances near the instrument
25. Theodolite is an instrument used for
- (a) Tightening of the capstan-headed nuts of level tube  
(b) Measurement of horizontal angles only  
(c) Measurement of vertical angles only  
(d) Measurement of both horizontal & vertical angles
26. The multiplying constant of a theodolite
- (a)  $f/i$  (b)  $(f + d)$   
(c)  $f/i + d$  (d)  $\frac{f}{d} + i$
27. A series of closely spaced contour lines represents
- (a) Steep slope (b) Gentle slope  
(c) Uniform Slope (d) Plane surface
28. Which of the following methods of contouring is most suitable for a hilly terrain?
- (a) Direct method (b) Square method  
(c) Cross section method (d) Tacheometric method
29. Benchmark is established by
- (a) Hypsometry (b) Barometric leveling  
(c) Spirit leveling (d) Trigonometric leveling

30. The first stage of deciding the alignment of a hill road is  
(a) Reconnaissance (b) Detsil survey  
(c) Trace out (d) Preliminary survey
31. The retention time of septic tank at average daily flow is  
(a) 8 hrs (b) 12 hrs  
(c) 24 hrs (d) 48 hrs
32. Which one of the following is the standard treatment of rapid sand filter?  
(a) Plain chlorination (b) Pre-chlorination  
(c) Post chlorination (d) Super chlorination
33. In the design of any water works project, a more accurate estimate of water that is required can be arrived at using  
(a) Total population of city  
(b) Daily consumption per person served  
(c) Total daily consumption averaged over one month  
(d) Total daily consumption averaged over ten years
34. The greatest mass constituent of any air pollutant is  
(a) Sulphur Dioxide (b) Hydro Carbons  
(c) Carbon Monoxide (d) Nitrogen Oxide
35. Turbidity of water is remedied by  
(a) Sedimentation (b) Chlorination  
(c) Filtration (d) All of these
36. Bio-chemical Oxygen Demand (BOD) is the amount of oxygen consumed by the \_\_\_\_\_ bacteria which causes biological decomposition of sewage  
(a) Anaerobic (b) Aerobic  
(c) Common (d) None of these
37. In flushing cisterns of water closets, height from top of pan to bottom of cistern is average \_\_\_\_\_ cm for high level cisterns.  
(a) 150 (b) 60  
(c) 70 (d) 80
38. Average domestic consumption of water per head per day in India is  
(a) 100 (b) 125  
(c) 135 (d) 150
39. Hardness of water is due to salts of calcium and \_\_\_\_\_  
(a) Sodium (b) Alumina  
(c) Magnesium (d) Potassium
40. pH value of drinking water should be close to  
(a) 6 (b) 7  
(c) 8 (d) 9
41. The gross diameter of a rivet is the diameter of  
(a) Cold rivet before driving (b) rivet measured after driving  
(c) Rivet hole (d) None of these

42. A riveted joint may fail due to  
(a) Shear failure of rivets (b) Shear failure of plates  
(c) Tearing failure of rivets (d) Tearing failure of plates
43. Efficiency of a riveted joint is defined as the ratio of  
(a) Least strength of a riveted joint to the strength of solid plate  
(b) Greatest strength of a riveted joint to the strength of solid plate  
(c) Least strength of a riveted plate to the greatest strength of the riveted joint  
(d) None of the above
44. In calculating shear and bending stresses, the effective diameter of the bolt shall be taken as  
(a) Hole diameter (b) Nominal diameter of bolt  
(c) Diameter (d) Actual bolt diameter
45. The strength of weld is equal to permissible stress multiplied by  
(a) Throat thickness (b) Throat area  
(c) Weld area (d) Leg length
46. The effective thickness fillet weld shall not be less than  
(a) 3mm (b) 2.5mm  
(c) 4mm (d) 3.5mm
47. The most economical section for a steel column is  
(a) Rectangular section (b) Tubular section  
(c) Solid round section (d) I- Section
48. Slenderness ratio of a compression member is defined as  
(a) Moment of Inertia/Least radius of gyration (b) Effective Length/Least radius of gyration  
(c) Moment of Inertia/Cross Sectional Area (d) Effective Length/Cross sectional area
49. Maximum slenderness ratio ( $l/r$ ) of compression member carrying dead loads and superimposed load shall not exceed  
(a) 180 (b) 250  
(c) 200 (d) 350
50. The effective length 'l' of a column held in position and restrained in direction at both ends in terms of actual length 'L' is  
(a)  $l = 2L$  (b)  $l = 0.65L$   
(c)  $l = L$  (d)  $l = 0.80L$
51. The pressed plates in pressed steel tanks have thickness of 3mm, 5mm and 6mm and the size of plate is  
(a) 1.00m×1.00m (b) 1.25m×1.25m  
(c) 1.30m×1.30m (d) 1.50m×1.50m
52. In pressed steel tank, the plates are connected at the junction by  
(a) Welding (b) Rivets  
(c) Bolts (d) Rivets and bolts
53. The minimum pitch to be used for rivet is  
(a) 2.2 times diameter of rivet (b) 2.5 times diameter of rivet  
(c) 2.0 times diameter of rivet (d) 1.75 times diameter of rivet

- 54.** The maximum pitch of to be used for rivet should not exceed (t is thickness of thinner plate)
- (a) 35t or 350mm, whichever is less (b) 30t or 300mm, whichever is less  
(c) 25t or 250mm, whichever is less (d) 32t or 300mm, whichever is less
- 55.** If 't' is the thickness of the plates, the diameter of rivet (F) to be used is to be calculated using the expression
- (a)  $F = 6\sqrt{t}$  (b)  $F = 5\sqrt{t}$   
(c)  $F = 4\sqrt{t}$  (d)  $F = 5.5\sqrt{t}$
- 56.** The amount to be deposited for performance guarantee in a Contract is
- (a) 5% of the contract amount (b) 2.5% of the contract amount  
(c) 2% of the contract amount (d) 3% of the contract amount
- 57.** The amount of earnest money which a contractor should deposit with the tender costing upto Rs. 10.00 crore is
- (a) 3% of the tendered amount (b) 2% of the tendered amount  
(c) 2.5% of the tendered amount (d) 5% of the tendered amount
- 58.** The cost of tender documents for works costing between Rs. 1 lakh and Rs. 50 lakh is
- (a) Rs. 250 (b) Rs. 750  
(c) Rs. 500 (d) Rs. 1000
- 59.** The time limit between the date of publication of tender in press and the date of receipt of tender for work costing more than Rs. 2.00 crore is
- (a) 12 days (b) 15 days  
(c) 14 days (d) 21 days
- 60.** The correct stages for executing the work is
- (a) Administrative Approval – Technical Sanction- Expenditure Sanction- Tender  
(b) Administrative Approval – Expenditure Sanction – Technical Sanction- Tender  
(c) Expenditure Sanction- Administrative Approval- Tender – Technical Sanction  
(d) None of these
- 61.** The provision contingency in an estimate for work upto Rs. 1.00 crore is
- (a) 2% (b) 5%  
(c) 4% (d) 3%
- 62.** In a project, revised estimate is necessary when the sanctioned amount is exceeded by:
- (a) 15% (b) 10%  
(c) 12% (d) 7.5%
- 63.** Tender Form to be used for percentage rate tender is
- (a) CPWD Form 6 (b) CPWD Form 8  
(c) CPWD Form 10 (d) CPWD Form 7
- 64.** For works costing above Rs. 20.00 crores, tender shall be invited in
- (a) CPWD Form 8 (b) Two/Three Envelop System  
(c) CPWD Form 7 (d) CPWD Form 6
- 65.** The form used for showing serial number of Measurement Book, issue and return is
- (a) CPWA 62 (b) CPWA 92  
(c) CPWA 72 (d) CPWA 82

**Directions (Questions 66 - 68) : Find the missing term in the following series:**

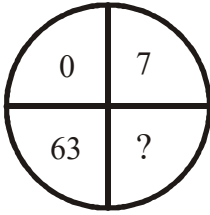
66. 2, 4, 8, 16, 32, \_\_\_\_\_, 128

- (a) 40
- (b) 64
- (c) 65
- (d) 81

67. 77, 7777, 777777, \_\_\_\_\_, 7777777777

- (a) 7777777
- (b) 77777777
- (c) 7777777777
- (d) 777777777777

68.



- (a) 15
- (b) 21
- (c) 26
- (d) 42

**Directions (Question 69 - 70) : Complete the analogy:**

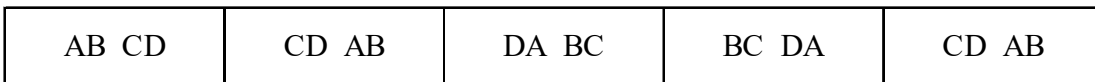
69. See is to look, as hear is to \_\_\_\_\_

- (a) ears
- (b) noise
- (c) sense
- (d) listen

70. Carpenter is to chisel, as cobbler is to \_\_\_\_\_

- (a) Anvil
- (b) saw
- (c) axe
- (d) drill

71. Which comes next in the sequence?

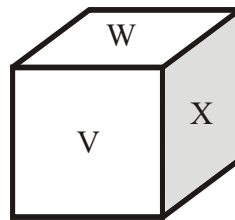
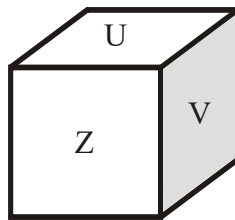
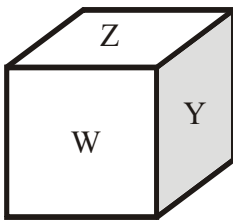


Answer Figures



- (a)
- (b)
- (c)
- (d)

72. Which letter is on the opposite face of X?



- (a) Z
- (b) W
- (c) Y
- (d) U

**Directions (Questions 73 - 75) :** *In the following questions, two statements are followed by two conclusions numbered I and II. Decide which of the given conclusions logically follows from the given two statements, disregarding commonly known facts:*

**73. Statements**

- I. All singers are smokers.
- II. Some smokers are drinkers

*Conclusions*

- I. All smokers are singers
- II. Some drinkers are not smokers

Give answer as

- (a) If only conclusion I follows
- (b) If only conclusion II follows
- (c) If neither I nor II follows
- (d) If both I and II follows

**74. Statements**

- I. All stones are precious.
- II. Some precious are yellow.

*Conclusions*

- I. Some precious are stones.
- II. All yellow are precious.

Give answer as

- (a) If only conclusion I follows
- (b) If only conclusion II follows
- (c) If neither I nor II follows
- (d) If both I and II follows

**75. Statements**

- I. Some scooters are pink.
- II. All pink are trains.

*Conclusions*

- I. Some scooters are trains
- II. No pink is a scooter

Give answer as

- (a) If only conclusion I follows
- (b) If only conclusion II follows
- (c) If neither I nor II follows
- (d) If both I and II follows

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