MIZORAM PUBLIC SERVICE COMMISSION

DEPARTMENTAL EXAMINATIONS FOR JUNIOR GRADE OF M.E.S. (AE/SDO) UNDER PUBLIC WORKS DEPARTMENT, GOVERNMENT OF MIZORAM, DECEMBER, 2023.

CIVIL ENGINEERING PAPER – II

Time Allowed : 3 hours FM : 100 PM : 40

Marks for each question is indicated against it.
Attempt all questions.

PART – A (50 MARKS)

Question No.3 is compulsory

1. (a) (i) Explain the application of positive and negative correction to the distance measured using incorrect chain. **(5)**

(ii) The length of a line measured by means of a 20 m chain was found to be 610.2m known to be 612.0m. What was the actual length of the chain? **(15)**

OR

(b) (i) Explain with diagram principle of Simple levelling. **(5)**

(ii) The staff reading on certain point was 3.894m. The staff was found to be 16cm out of plumb in 4m. What is the correct staff reading , if the staff was held vertically? **(15)**

2. (a) (i) Explain Broken back curves with suitable diagram. What is the remedial measure to avoid it? **(10)**

(ii) What is the advantage of provision of intermediate sight distance in hill roads? **(5)**

OR

(b) During the field visit of village road, it was found at one location of curve that the length of chord is 12.96m and that of the offset length from the chord to the centre line is 0.60m. If the design speed is 35 km/h, calculate the rate of super-elevation. Comment on your result. **(15)**

3. (a) Draw a typical Cross-Section of pavement in hill cut and show in it side drain and catch water drain. **(7)**

(b) What kind of retaining wall should be provided for height upto 4.0m, 4.0 to 8.0 m and above 8.0m. **(8)**

PART – B (50 MARKS)

4. (a) (i) What is the advantage of viscosity grade bitumen over penetration grade? **(5)**

(ii) Explain in detail the principle of bituminous emulsion with suitable diagram. How different grade of emulsions are manufactured? **(10+5=15)**

OR

(b) (i) What is the difference between Structural failure and Functional failure of pavement? **(5)**

(ii) Explain the phenomenon 'Bath-tub' situation within the pavement structural layer with suitable diagram. **(10+5)**

5. (a) (i) Explain in detail maintenance of earthen shoulder. **(10)**

(ii) What are the factors governing the selection of Bridge site? **(10)**

OR

(b) (i) Explain longitudinal marking, transverse marking, Hazard marking, Block marking and Arrow marking in pavement. **(10)**

(ii) Write short note on the role played by Engineering, Enforcement and Education for the safety in Road ? **(10)**

6. (a) What is to be done to defective material brought to the site? **(5)**

(b) What is the procedure to be followed for imported materials not covered by specifications in the contract? **(5)**

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