

Module-3

- 5 a. Explain briefly, how CBR value of given soil is determined. (08 Marks)
 b. Explain with a neat sketch, how the plate load test is conducted to determine the modulus of sub grade reaction of soil and for making correction for small plate size. (08 Marks)

OR

- 6 a. Explain the meaning of ESWL. How is it determined for a dual wheel assembly and what are its applications? (08 Marks)
 b. Calculate the warping stress at interior, edge and corner region in a 25cm thick concrete pavement with transverse joint at 11m interval and longitudinal joints at 3.6m interval. The modulus of subgrade reaction is 6.9kg/cm^3 . Assume temperature difference for day conditions to be 0.6°C per cm of slab thickness. Assume radius of loaded area as 15cm $C_x = 1.03$ and $C_y = 0.55$, $E = 3 \times 10^5\text{kg/cm}^2$, $\mu = 0.15$, $e = 10 \times 10^{-6}$ per $^\circ\text{C}$. (08 Marks)

Module-4

- 7 a. Explain the construction steps for Bituminous concrete surface course. (08 Marks)
 b. What do you understand by Wet-Mix Macadam? What are its advantages and disadvantages over Water Bound Macadam? (08 Marks)

OR

- 8 a. List the desirable properties and explain the specifications of material for WBM pavement. (08 Marks)
 b. Enumerate the construction steps for cement concrete pavements. (08 Marks)

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- 9 a. Explain with sketches how the subsurface drainage system is provided to lower the water table and control the seepage flow. (08 Marks)
 b. The maximum quantity of water expected in one of the open longitudinal drains on clayey soil is $0.9\text{m}^3/\text{sec}$. Design the cross section and longitudinal slope of trapezoidal drain assuming the bottom width of the trapezoidal section to be 1.0m and cross slope to be 1.0 vertical to 1.5 horizontal. The allowable velocity of flow in the drain is 1.2m/sec and Mannings roughness coefficient is 0.02. (08 Marks)

OR

- 10 a. Explain the various road user benefits of highway improvements. (08 Marks)
 b. Calculate the annual cost of a stretch of highway from the following particulars:

Item	Total cost Rs. In lakhs	Estimated life, years	Rate of interest %
Land	12.0	100	6
Earth Work	9.0	40	8
Bridge culverts	7.5	60	8
Pavement	14.0	15	10

The average cost of maintenance of the Road is Rs. 1.5 lakhs per year. (08 Marks)
