B.E. (Civil Engineering) Fourth Semester (C.B.S.)
Transportation Engineering – I Paper - III

P. Pages : 2

Time : Three Hours

TKN/KS/16/7353

Max. Marks : 80

_____

Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) What for Jayakar committee was set-up? What were the recommandations of the committee? **7**

b) Describe the abrasion test on aggregate with IRC recommended values. **6**

OR

2. a) Enlist various test on bitumen? Explain any two with neat sketch. **7**

b) Discuss the engineering survey to be undertaken for the new road proposal. **6**

3. On a state highway, horizontal curve is provided with ruling minimum radius. Design the following geometric features: **14**
i)   Superelevation.
ii) Extra widening.
iii) Length of Transition curve.
iv) SSD & ISD.
Given that design speed is 80 kmph. Assume all other suitable data.

OR

4. a) In a vertical alignment of two gradients of + 3.0% & -5.0%, design the length of summit curve for the Design speed of 90 kmph to provide SSD. **7**

b) Discuss the types & purpose of providing curb with neat sketches. **7**

5. a) A flexible pavement is to be designed with the following data. **8**

i)   Area of plunger = 19.6m^2.
ii) Expected final traffic volume = 500 CND.
iii) Load at 2.5 mm penetration = 2.80 kg / cm^2.
iv) Load at 5.0 mm penetrations = 3.95 kg/cm^2.
v)   Sub-base CBR = 22%.
vi) WBM base course CBR = 85%.
Suggest a suitable crust composition.

b) Differentiate between flexible & Rigid pavement. **6**

OR

6. a) Calculate the wheel load stresses at corner, edges & Interior region from the given details. **8**

    i) Design wheel load = 4000 kg.

    ii) Tyre pressure = 6.1 kg/cm^2.

    iii) Modulus of subgrade reaction = $4 \text{ kg}/\text{cm}^2/\text{cm}$.

    iv) $E = 2 \cdot 5 \times 10^5 \text{ kg}/\text{cm}^2$, $\mu = 0.15$.

    v) Thickness of slab = 13 cm.

b) Describe the group Index method of flexible pavement design. **6**

7. a) Discuss Road user characteristic in detail. **6**

b) Discuss 'Spot speed studies' in detail. Explain how the data is represented. **7**

OR

8. a) Discuss the traffic volume study in detail. Comment on "30th highest hourly volume of traffic. **7**

b) Discuss the parking study in detail. **6**

9. a) What are the points to be considered while selecting site for a new bridge. **7**

b) Calculate the total depth for the following condition. **6**

    i) 3 Spans of 2.5 m.

    ii) 2 Span of 4.5 m.
    Given that average discharge = 325 m^3/sec. & silt factor = 1.1.

OR

10. a) Explain the computation of flood discharge by rational approach. **6**

b) Explain the following terms: **7**
    i) Afflux   ii) Clearance

11. a) Describe various types of cofferdams. **7**

b) Describe various types of wing walls. **6**

OR

12. Write short note on **any three.** **13**

    i) Economic span.

    ii) Classification & Numbering of bridges.

    iii) Maintenance & Inspection of bridge.

    iv) Bridge aesthetic.

    v) Culverts.

****