B.Tech. (Main & COP)
Fourth Semester Theory Examination 2016-17
Transportation Engg.-I

Time: 3 Hours   Total Marks: 100

Note Attempt all questions. IRC 37 and IRC 58 is allowed.

1.   Attempt any four parts of the following: (5x4=20)
   (a) Explain the role of road development in the overall progress of rural areas in India.
   (b) Discuss the modified road classification system recommended by the Third Twenty year Road Development Plan. What are its merits as compared to the previous classifications?
   (c) What are various factors to be considered in the alignment of a new highway route? Explain with sketches, where necessary.
   (d) Distinguish between 'camber' and 'super-elevation'.
   (e) Explain the 'PIEV' theory for understanding the total reaction time of a driver when they see a danger ahead.
   (f) What is an 'ideal transition curve'? What are the modifications? What shapes are commonly used for highways?

2.   Attempt any two parts of the following: (10x2=20)
   (a) Discuss the various traffic studies and their importance. Explain the term 'traffic volume'. What are the objectives of carrying out traffic volume studies?
   (b) What is the procedure for designing pedestrian and traffic signal by various methods? Explain.
   (c) List the various types of intersections. Explain the design principle of rotary intersection as per IRC Code.

3.   Attempt any two parts of the following: (10x2=20)
   (a) Explain the differences between flexible and rigid types of pavements. Also, list the various factors which affect pavement design, and explain them briefly.

(b) Calculate the load and temperature stresses at edge regions of a cement concrete pavement using IRC:58. Stress equation, for the following data:

    Wheel Load = 5100 kg.
    Modulus of Elasticity of Concrete = 3×10^5 kg/cm^2
    Modulus of Subgrade Reaction = 6 kg/cm^3
    Radius of Contact Area = 15 cm
    Bradbury's coefficient for L/l value of 5.5 = 0.82
    Poisson's ratio of concrete = 0.15
    Thickness of pavement = 20 cm
    Temperature differential of the location = 18^0C

(c) Explain the CBR method of flexible pavement design. What are its limitations?

4.   **Attempt any two parts of the following:**   (10x2=20)
 (a) Write short notes on:
   (i)   Dry Bound Macadam
   (ii)   Wet Mix Macadam
 (b) Why is Asphaltic Concrete superior to other types of bituminous construction? What are its applications?
 (c) What are the advantages and disadvantages of concrete roads? List out the steps involved in the construction of a concrete pavement.

5.   **Attempt any two parts of the following:**   (10x2=20)
 (a) What are the various types of parking facilities designed for traffic needs? Compare kerb parking with off-street parking.
 (b) What are the various types of parking studies to be conducted? Explain in detail.
 (c) Write a detailed note on 'Traffic regulatory measures for on street parking facilities'.