Registration No :

4ᵗʰ Semester Regular/Back Examination: 2022-23
SUBJECT: Transportation Engineering
BRANCH(S): C&EE, Civil
Time : 3 Hour
Max Marks : 100
Q.Code : M172
Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.
Design codes IRC:37 and IRC:58 are not allowed inside exam hall .The figures in the right hand margin indicate marks.

Part-I

Q1   **Answer the following questions:**   (2 x 10)
  a)   What is map study?
  b)   What are the objectives of providing extra widening?
  c)   Write any two functions of IRC.
  d)   Define camber. Why it is provided?
  e)   Differentiate between prime coat and seal coat.
  f)   As per IRC: 37-2012, What is SAMI layer?
  g)   Define angularity number.
  h)   What are the factors on which PCU values depend?
  i)   Differentiate between Dowel bar and Tie bars.
  j)   What is meant by WBM?

Part-II

Q2   **Only Focused-Short Answer Type Questions- (Answer Any Eight out of**   (6 × 8)
           Twelve)
  a)   What are the significant recommendations of Jayakar Committee report?
  b)   Explain how the final location and detailed survey of a highway are carried out.
  c)   Briefly explain the factors controlling the highway alignment?
  d)   Explain briefly the modified classification of road system in India as per third twenty year road development plan.
  e)   Calculate the stopping sight distance for a two way single lane road at a descending gradient of 1 in 30 for design speed of 65 kmph. Assume coefficient of longitudinal friction is 0.35.
  f)   Briefly explain the impact test of aggregate.
  g)   Differentiate between flexible pavement and rigid pavement.
  h)   Briefly explain the floating car method for speed and delay study.
  i)   What are the various factors to be considered in pavement design?
  j)   Explain how the filter material is designed for use in sub-surface drainage system.
  k)   What are the various causes of formation of wave and corrugations in flexible pavements? Suggest remedial measures.
  l)   Briefly explain the stresses develop in rigid pavement.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 Derive an expression for super elevation required for highway at horizontal curve. **(16)** Calculate the super elevation required for the design speed of 90 kmph for a Nation highway. There is horizontal curve of radius 270m on a certain locality. Assume any other data.

Q4 Briefly explain the step by step procedure for design of flexible pavement as per **(16)** IRC:37-2012.

Q5 Specify the materials required for construction of Bituminous Macadam roads. **(16)** Write down the construction steps for Bituminous Macadam road.

Q6 Explain the various types of failures in rigid pavement and their causes. **(16)**