



**INTERNATIONAL CENTRE FOR APPLIED SCIENCES
MAHE, MANIPAL**

B.Sc. (Applied Sciences) in Engg.

End – Semester Theory Examinations – May 2021

IV SEMESTER - HIGHWAY ENGINEERING [ICE 241]

(Branch: CIVIL)

Time: 3 Hours

Date: 12 May 2021

Max. Marks: 50

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- ✓ **Answer ALL the questions.**
 - ✓ **Missing data, if any, may be suitably assumed**
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- 1A.** What is Super elevation? Explain the steps for super elevation design. (5)
- 1B.** Calculate the safe overtaking sight distance for a design speed of 96kmph. Assume speed of overtaking vehicle ' V_b '=80kmph, Acceleration ' A '=2.5kmph/s and Reaction time of driver ' t ' = 2 seconds. (5)
- 2A.** Explain the various available methods for measuring speed and delay for traffic studies. (5)
- 2B.** What are the factors that affect Passenger Car Unit Values? (5)
- 3A.** What are the factors that Motor Vehicle Operation Costs (VOC) depends on? (5)
- 3B.** What are the importance of highway drainages? (5)
- 4.** The 15 minute-traffic counts on cross roads 1 and 2 during peak hour are observed as 178 and 142 vehicles per lane respectively approaching the intersection in the direction of heavier traffic flow. If the amber times required re 3 and 2 seconds respectively for two roads based on approach speeds, design the signal timings by trial cycle method. Assume an average time headway of 2.5 seconds during green phase. (10)
- 5A.** Explain the following with the help of neat diagram: (5)
1. Equivalent single wheel load (ESWL)
 2. Joints in Rigid Pavements.
- 5B.** Write a short note on typical rigid pavement failures. (5)
