



**ELIZADE UNIVERSITY, ILARA-MOKIN**  
**FACULTY OF ENGINEERING**

**DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING**

**COURSE CODE: CVE 517      SESSION/SEMESTER: FIRST SEMESTER/ 2019/2020**

**COURSE TITLE: HIGHWAY ENGRINEERING II      LEVEL: 500L**

**TIME ALLOWED: 2 HOURS 30 MINUTES**

**INSTRUCTION: ATTEMPT ANY FOUR QUESTIONS**

**Question 1 (15 marks)**

- 1a. i.** Define Highway Planning. (2 marks)
- ii.** Highlight four problems that are related to the highway mode of transportation. (4 marks)
- iii.** How will you reduce the negative impacts of highways? (1.5 marks)
- 1b.** Briefly discuss the three main categories which traffic studies may be grouped. (7.5 marks)

**Question 2 (15 marks)**

- 2a. i.** Explain why by traffic volume studies are conducted. (3 marks)
- ii.** What is Average Annual Daily Traffic (AADT) used for? (5 marks)
- 2b.** Describe the two basic methods of conducting traffic volume count. State their merit and demerit. (7 marks)

**Question 3 (15 marks)**

- 3a.** Outline the functions of pavement structure. (6 marks)
- 3b.** Draw a schematic diagram of typical flexible and rigid pavements. (4 marks)
- 3c.** Draw a schematic diagram showing the behaviour of 'Flexible' and 'Rigid' Pavement under wheel loads. (5 marks)

**Question 4 (15 marks)**

- 4a.** In tabular form, compare Highway and Airport Pavements. (9 marks)
- 4b.** Enumerate the satisfactory design factors to be considered in the thickness design of flexible highway pavements. (6 marks)

**Question 5 (15 marks)**

- 5a. i.** Define Maintenance in relation to road pavement. (2 marks)
- ii.** Why is maintenance necessary? (2 marks)
- iii.** What are the things that could necessitate maintenance? (3 marks)
- 5b. i.** Explain the term "defect or distress" in pavement. (2 marks)
- ii.** Outline six causes of defects in flexible pavement. (6 marks)

**Question 6 (15 marks)**

- 6a.** Write short note on Cut-back bitumen and list the types that can be produce using different solvents. (5 marks)
- 6b.** Briefly explain the significance of the following bitumen tests. (10 marks)
  - Penetration test
  - Specific gravity test
  - Flash and fire point test
  - Viscosity test