FACULTY OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING
SECOND SEMESTER EXAMINATION
(AUGUST 2018)
2017/2018 ACADEMIC SESSION

Course Title: Transportation Engineering

Course Code: CVE 512

HOD'S SIGNATURE

Instructions:

1) Attempt any four Questions
2) Time Allowed: 2 hrs 30 mins
3) SEVERE PENALTIES APPLY FOR MISCONDUCT, CHEATING, POSSESSION OF UNAUTHORIZED MATERIALS DURING EXAMINATION

FACULTY OF ENGINEERING

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

B.Sc. (Civil Engineering) Degree Examination

Second Semester 2017/2018 Session

CVE 512: Transportation Engineering

August 2018 Time Allowed: 2 hrs 30 mins

Instruction: Attempt Four Questions.

QUESTION 1 (15 marks)

a) Briefly explain what you understand by the Geometric Design of Highway with respect to its fundamental objectives. **5 Marks**

b) Highway design is based on specified design standards and controls. Enumerate ten factors on which the roadway system depends. **10 Marks**

QUESTION 2 (15 marks)

a) The general form of the parabolic equation, as applied to vertical curve is given as:

$y = ax^2 + bx + c$

where:

y is roadway elevation at distance x from the beginning of the vertical curve (the PVC) in m , x is distance from the beginning of the vertical curve in stations or m, a, b are coefficients, and c is elevation of the PVC in m. With a suitable schematic diagram, show that: $a = \frac{G2-G1}{2L}$. Given that G_2 and G_1 are the gradient or slope of the curve.

5 Marks

b) An equal-tangent vertical curve is to be constructed between grades of -2.0% (initial) and + 1.0 % (final). The PVI is at station 3 + 350.000 and at elevation 130m. Due to a street crossing the roadway, the elevation of the roadway at station 3 + 415.000 must be at 131m. Design the curve **10 Marks**

QUESTION 3 (15 marks)

a) What do you understand by Traffic flow theory? **5 Marks**

b) With a suitable schematic diagram and the theory postulated with respect to the shape of the curve depicting the relationship between the elements, explain the fundamental diagrams of traffic flow. **10 Marks**

QUESTION 4 (15 marks)

a) **i.** Define Intersection. **2 Marks**

ii. State the three general categories in which Intersections are classified. **3 Marks**

b) Draw a schematic diagram of different types of intersections that meet at different gradient. **6 Marks**

c) Traffic signals are needed for the control of conflicting streams of vehicular and pedestrian traffic at intersections. State the warrants defining the minimum conditions under which the installation of traffic signals becomes justifiable. **4 Marks**

QUESTION 5 (15 marks)

a) Briefly explain the two types of parking facilities. **5 Marks**

b) Define the following terms:

i. Space hour **1 Mark**

ii. Parking accumulation **1 Mark**

iii. Parking load **1 Mark**

iv. Practical capacity **1 Mark**

v. Turn over **1 Mark**

c) The purpose of a parking study is to develop a parking programme which meets the requirements of an area. State the necessary information needed. **5 Marks**

QUESTION 6 (15 marks)

a) Define Transportation System. **2 Marks**

b) List the importance of transportation in any society. **5 Marks**

c) Adduce factor that causes Traffic Congestion on urban road and propose pragmatic approach for its mitigation. **8 Marks**