



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology
Department of BUILDING & Civil engineering
UNIVERSITY EXAMINATION FOR:
BACHELOR OF TECHNOLOGY IN CIVIL ENGINEERING

TCV 4428: TRAFFIC ENGINEERING II B
SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: NOVEMBER 2024
TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of five questions.

Attempt question ONE (Compulsory) and any other TWO questions

Do not write on the question paper.

QUESTION ONE 25 Marks) (COMPULSORY)

- a) Differentiate between Junction and Interchange (4 marks)
- b) Discuss, with sketches Underpass and Overpass as applied Interchanges (6 marks)
- c) Discuss what functions of the junction, traffic lights and interchange (4 marks)
- d) Describe The changame Interchange (6 marks)

ANSWER ANY TWO QUESTIONS FROM THIS SECTION

QUESTION TWO (20 Marks)

- a) Differentiate between Time Mean Speed and Space Mean Speed. Give example for each. (4 marks)
- b) The following are spot speeds observed at Makupa course way: 70,75, 65,79 and 85 km/h. Determine the Time Mean Speed and Space Mean Speed. (4 marks)
- c) Explain the cause of Shockwaves and Bottlenecks in our Roads and how they can be minimized. Give examples in your city. (7 marks)
- d) Outline the performance and asset management of signal facility (5 marks)

QUESTION THREE (20 Marks)

- a) Explain term Hierarchy as applied in Traffic Engineering (2 marks)
- b) Discuss the objectives of Road hierarchy (4 marks)



- c) Demonstrate the relationship between land use and Road hierarchy (6 marks)
- d) State THREE
 - i. Functional characteristics
 - ii. Frictional characteristics (8 marks)

QUESTION FOUR (20 Marks)

- a) Define any FOUR of the following terms:
 - i. Controller
 - ii. Cycle (cycle length)
 - iii. Phase/signal phase
 - iv. Interval/clearance interval
 - v. All-red interval
 - vi. Peak hour factor (PHF)
 - vii. Critical lane group
 - viii. Saturation flow rate (6 marks)
- b) Discuss the Four types of Intersections (6 marks)
- c) In certain junction, the average normal flow of traffic on cross roads A and B during design period are 400 and 250 pcu per hour respectfully. The saturation flow values on these roads are estimated as 1250 and 1000 pcu per hour for A and B respectively. The all-red time required for pedestrian crossing is 12 sec. Design two phase traffic signal with pedestrian crossing by Webster method. (8 marks)

QUESTION FIVE (20 Marks)

- a) Discuss importance of Road hierarchy. (6 marks)
- b) Describe the management of Junction signals. (8 marks)
- c) You have been commissioned to design Road Hierarchy in Mombasa town. Discuss (6 marks)