



MACHAKOS UNIVERSITY

University Examinations for 2024/2025 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

THIRD YEAR FIRST SEMESTER EXAMINATION FOR DEGREE IN
BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECV 306: TRANSPORTATION PLANNING AND DEVELOPMENT

DATE: 15TH JANUARY, 2025

TIME: 11.00 AM – 1.00 PM

INSTRUCTIONS:

Answer question ONE (Compulsory) and any other TWO questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Define the term Transportation system. (2 marks)
- b) A combination of elements and their interactions, which produce the demand for travel within a given area and the supply of transportation services to satisfy this demand. Kenya has made a stride in developing and enhancing road transportation. Northern Corridor road networks cover approximately 12,707 Km is one of such major road transportation project.
Describe Any FIVE road infrastructure facilities considered during the planning and development of road transportation. (5 marks)
- c) Define the term multimodal transport. (3 marks)
- d) Kenya is currently making strides in implementing multimodal transport. Explain five challenges hindering efficient implementation of multi-modal transport system in major cities in Kenya especially the capital city of Nairobi. (6 marks)
- e) Explain the characteristics of an efficient transportation system. (4 marks)
- f) Describe Any Four factors considered in route location of a new Road. (10 marks)

QUESTION TWO (20 MARKS)

- a) Describe Any four factors influencing efficiency of a transportation system. (4 marks)
- b) Discuss the roles played by government and linkage to the supply industry and financial community in enhancing transportation system in Kenya. (6 marks)

- c) Describe the functions of the following Authorities created by Acts of Parliaments for regulation and planning and development of transportation services in Kenya.
- i) Responsibility of Kenya Civil Aviation authority as defined by the Civil Aviation Act No. 21 of 2013
 - ii) Kenya Roads Authorities as defined in Kenya Roads Act No. 2 of 2007 (Revised 2012). (10 marks)

QUESTION THREE (20 MARKS)

- a) Define the term Bus Rapid Transit Systems (BRTS) as a method for enhancing sustainable transportation space requirements. (3 marks)
- b) Describe any Seven features of an efficient Bus Rapid Transit Systems (BRTS). (7 marks)
- c) Define Non-Motorized Transport (NMT). (3 marks)
- d) Describe the benefits of non-motorized Transport (NMT). (7 marks)

QUESTION FOUR (20 MARKS)

- a) Define the term transportation System as used in Transportation planning and development. (4 marks)
- b) Describe modalities of the Kenya government for funding transportation infrastructure development projects. (6 marks)
- c) Outline Four main parameters causing road accidents. (6 marks)
- d) Using appropriate examples describe transportation infrastructures for at least FOUR modes of transport. (4 marks)

QUESTION FIVE (20 MARKS)

- a) Explain the criteria used in determining following three parameters of sustainable transportation planning and development;
 - i. Social sustainability
 - ii. Economic Sustainability
 - iii. Environmental Sustainability (8 marks)
- b) Describe any FOUR functions performed by the National Transport and Safety Authority. (4 marks)
- c) Explain the four basic physical elements of transportation system. (8 marks)