



MACHAKOS UNIVERSITY

University Examination 2019/2020

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

THIRD YEAR FIRST SEMESTER EXAMINATION FOR

DIPLOMA IN CIVIL ENGINEERING

BCECD 306 CREATIVE ENGINEERING

DATE: 6/12/2019

TIME: 8.30-10.30 AM

INSTRUCTIONS

This paper comprises five questions

Answer question ONE (compulsory) and any other TWO questions.

QUESTION ONE (30 MARKS) (COMPULSORY)

- a) Mention four features incorporated in road design to minimize injuries. (4 marks)
- b) Describe the phases of the architectural design process. (10 marks)
- c) Explain the phases of the creative process. (10 marks)
- d) Outline the stages of the design process. (6 marks)

QUESTION TWO (20 MARKS)

- a) Define the following terms;
 - i. average annual daily traffic
 - ii. average daily traffic (4 marks)
- b) Outline four characteristics of divergent thinking. (8 marks)
- c) Enumerate eight principles of brainstorming. (8 marks)

QUESTION THREE (20 MARKS)

- a) List down four documents developed in the architectural design process. (4 marks)
- b) Outline considerations to be made during the geometric design of road. (16 marks)

QUESTION FOUR (20 MARKS)

- a) Mention five guidelines to be considered when selecting a design speed. (5 marks)
- b) Briefly explain the stages in the design process. (7 marks)
- c) Briefly explain four types of architectural drawings. (8 marks)

QUESTION FIVE (20 MARKS)

- a) Outline the principal vehicle dimensions that affect the design of roads. (4 marks)
- b) Design and draw the layout of a two-bedroom bungalow to include kitchen, water closet, bathroom porch and passage. Include dimensions. (16 marks)