



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

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: 9/8/2021

TIME: 8.30-10.30 AM

INSTRUCTIONS

- *This paper comprises of five questions. Answer **three** questions*
- *Question one is **compulsory** and carry 30 marks*
- *Answer any other **two** questions*

QUESTION ONE (30 MARKS) (COMPULSORY)

- a) Outline the stages of the design process (10 marks)
- b) Explain the phases of creative process (5 marks)
- c) Describe the phases of the architectural design process (7 marks)
- d) Mention four features incorporated in road design to minimize injuries (8 marks)

QUESTION TWO (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)

QUESTION THREE (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 FOUR (20 MARKS)

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

QUESTION FIVE (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)