



# MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

FIFTH YEAR SPECIAL/ SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECV 522: DESIGN AND CONSTRUCTION OF DAMS

DATE: 24/3/2021

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)

- a) Briefly discuss THREE dam subsurface exploratory methods (15 marks)
- b) A masonry dam of trapezoidal section is 10m high. It has top width of 1m and bottom width of 6m. The face exposed to water has slope of 1 horizontal to 10 vertical. Calculate the maximum and minimum stresses on the base when the water level coincides with the top of the dam. Take weight density of masonry as  $22.563 \text{ kN/m}^3$ . (15 marks)

### QUESTION TWO (20 MARKS)

Discuss the factors to be considered in selection of dam sites

### QUESTION THREE (20 MARKS)

A trapezoidal masonry dam having 4m top width, 8m bottom width and 12m high, is retaining water up to a height of 10m. The density of masonry is  $2000 \text{ kg/m}^3$  and coefficient of friction between the

dam and soil is 0.55. The allowable compression stress is 343,350N/m<sup>2</sup>. Check the stability of the dam

**QUESTION FOUR (20 MARKS)**

Instrumentation and proper monitoring and evaluation are extremely valuable in determining the performance of a dam. You have been asked to make a short presentation to a committee of stakeholders who are writing a proposal for funding of the above-mentioned subject for a dam in your locality. As an expert, discuss **TEN** features of the dam to be monitored.

**QUESTION FIVE (20 MARKS)**

- a) Discuss the corrections carried out in standard penetration test (10 marks)
- b) Briefly discuss FIVE types of dams (10 marks)