



MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

FIFTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (CIVIL ENGINEERING)

ECV 522: DESIGN AND CONSTRUCTION OF DAMS

DATE: 14/12/2021

TIME: 11.00-1.0 PM

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 (COMPULSORY) (30 MARKS)

- a) How are dams classified? Discuss in detail. (20 marks)
- b) What factors affect the selection of site for a dam? Discuss them briefly. (10 marks)

QUESTION TWO (20 MARKS)

- a) List three dams built and operational in Kenya and write the primary purpose of the reservoir (12 marks)
- b) Discuss at least four advantages and disadvantages of constructing a large dam. (8 marks)

QUESTION THREE (20 MARKS)

- a) What are spillways and what is their necessity? (6 marks)
- b) Enumerate the different types of spillways which are used in dam construction. (6 marks)
- c) Draw a neat sketch of a typical earth dam and describe the basic elements. (8 marks)

QUESTION FOUR (20 MARKS)

Describe the following terms with the context of hydraulic structures. Use diagrams that reinforce your discussion.

- a) Spillways
- b) Outlet structures
- c) Intake structures
- d) Stilling basin
- e) Hydraulic jump

QUESTION FIVE (20 MARKS)

An earthen dam has to be constructed to store a maximum depth of 12m of water over river bed consisting of coarse sand and gravel up to a depth of 3m below river bed followed thereafter by hard and sound rock. Clay soil is available in plenty in the vicinity of the river. Draw and detail a suitable section of the dam at the river bed.