



MACHAKOS UNIVERSITY

University examinations 2022/2023

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

FIFTH YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR
BACHELOR IN CIVIL ENGINEERING

ECV 522: DESIGN AND CONSTRUCTION OF DAMS

Date 9/3/2023

time 2:00 – 4:00 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 (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)

a) Describe the following terms with the context of hydraulic structures. Use diagrams that reinforce your discussion.
(20 Marks)

1. Spillways
2. Outlet structures
3. Intake structures
4. Stilling basin
5. Hydraulic jump

QUESTION FIVE (20 Marks)

a) 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.
(20 Marks)