



## **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**

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#### **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)