



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

FIFTH YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (CIVIL ENGINEERING)

ECV 504: CONSTRUCTION MANAGEMENT

DATE: 9/8/2021

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 (COMPULSORY) (30 MARKS)

- a) Imagine you have been appointed as a Resident Engineer for a Civil Engineering Project implemented under a contract agreement. Briefly discuss the role of the contractor and that of the Client /Employer. (5 marks)
- b) i. Name the authority that appoints the Engineer on a civil Engineering contract implemented under FIDIC conditions of contract Part I (Fourth Edition) (2 marks)
- ii. Describe the clauses of the general conditions of contract part I under which the Engineer exercises his powers in question 1 b i) above (3 marks)
- c) i. List all documents that constitute a civil engineering contract under FIDIC conditions. (5 marks)
- ii. Explain the difference between a performance bond undertaking and tender security undertaking (5 marks)
- d) i. Briefly describe the process of procurement of a large civil engineering contract starting from prequalification to award of tender. (5 marks)
- ii. Outline the statute of the laws of Kenya that governs the public procurement of civil engineering projects and services. (5 marks)

QUESTION TWO (20 MARKS)

- a)
 - i. You have been appointed to supervise a concrete construction project at a remote site in Northern Kenya. Describe the elements of site planning and layout that you will consider. (5 marks)
 - ii. Name main quality control tests that will require to be done by the contractor in question 2 a i) above. (3 marks)
 - iii. Explain the purpose of the tests in question a ii) above (2 marks)
- b)
 - i. A 30 km gravel access project road is to be constructed in Kiambu County to feed into the Thika Highway. Give an inventory of the main construction equipment required to undertake the project. (5 marks)
 - ii. Explain the term borrow material (2 marks)
 - iii. Name the soil tests that will be undertaken for quality assurance. (3 marks)

QUESTION THREE (20 MARKS)

- a)
 - i) Give two reasons why deep excavation is sometimes necessary in the civil and building industry. (5 marks)
 - ii. State any four civil engineering techniques applied to ensure stability of deep excavations. (5 marks)
- b)
 - i. Discuss de-watering of a construction site (5 marks)
 - ii. Briefly name and illustrate by drawings four (4) widely used de-watering techniques in Civil Engineering Construction. (5 marks)

QUESTION FOUR (20 MARKS)

- a) Ground water is the only way feasible source of water in some parts of Kenya. Access to this groundwater is by drilling a borehole. Briefly describe two types of water borehole drilling rigs commonly used in Kenya. (10 marks)
- b)
 - i. Outline the process of developing a water borehole for a rural community water supply in Turkana County starting from acquisition of a borehole permit. (5 marks)
 - ii. Explain the statute of the laws of Kenya under which a borehole permit is granted. (5 marks)

QUESTION FIVE (20 MARKS)

- a) Collapsing of buildings has been a common feature in the building and construction industry in Nairobi with severe consequences including loss of lives. Discuss the factors that have contributed to these situations. (10 marks)
- b) i. Name three types of dam embankments that are commonly constructed in Kenya (5 marks)
- ii. Outline the common causes of Dam failure. (5 marks)