



MACHAKOS UNIVERSITY

UNIVERSITY EXAMINATIONS 2024/2025

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

FIFTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECV 509: CIVIL ENGINEERING PRACTICE

Date:

Time :

INSTRUCTIONS

- *This paper comprises of **FIVE** questions. Answer **THREE** questions*
- *Question one is **Compulsory** and carries 30 marks*
- *Answer any other **TWO** questions*

Question One – Compulsory (30 marks)

- a) Describe the typical consequence of unethical behaviour in engineering. [3 Marks]
- b) Describe the primary purpose of the FIDIC Red Book and the FIDIC Yellow Book.
[4 Marks]
- c) What are the main responsibilities of the Engineer under the FIDIC Red Book?
[4 Marks].
- d) Explain the process for submitting a claim under both the FIDIC Red and Yellow Books.
[6 Marks]
- e) A contractor is required to build a bridge under the FIDIC Yellow Book. Midway through the project, the government impose new environmental regulations that significantly increase costs. Outline the steps the contractor should take to address this issue.
[6 Marks]

- f) A Contractor under the FIDIC Red Book faces delays due to adverse weather conditions. Describe the process he can use to claim an extension of time, referencing specific clauses. [7 marks]

QUESTION TWO (20 MARKS)

- a) Giving relevant illustrations, describe the concept of sustainable engineering and its importance in civil engineering projects. [6 Marks].
- b) Describe two strategies that engineers can employ to ensure ethical decision-making in their professional practice. [4 Marks]
- c) A Contractor under the FIDIC Red Book has encountered a delay due to late delivery of materials by a supplier. What steps should the Contractor take to manage this situation and claim for an extension of time? [10 Marks]

QUESTION THREE (20 MARKS)

- a) A Contractor under the FIDIC Red Book encounters unexpected underground water during excavation, leading to delays and additional costs. Outline the steps the Contractor should take, citing relevant clauses. [10 marks]
- b) A Contractor is executing a building project under the FIDIC Yellow Book. During construction, they realize that the structural design provided by the Employer contains flaws that will delay the project. What steps should the Contractor take to address this issue? Cite relevant clauses. [10 marks]

QUESTION FOUR (20 MARKS)

- c) Under the FIDIC Yellow Book, how should a Contractor manage design changes requested by the Employer after the contract has been awarded? Cite the relevant clauses. [10 Marks]
- d) A Contractor under the FIDIC Yellow Book has completed a portion of the work and is preparing for inspection and testing. Outline the steps to ensure compliance with the requirements, citing specific clauses. [10 Marks]

QUESTION FIVE (20 MARKS)

- a) Discuss the significance of performance bonds under the FIDIC Yellow Book and how they protect the interests of the Employer. Cite relevant clauses.
- [10 Marks]
- b) Consider a hypothetical scenario where you are an engineer in a project and you discover a safety flaw in a bridge design that could potentially endanger lives. Outline the steps you should take to address this issue ethically.

[10 Marks]