JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

UNIVERSITY EXAMINATION FOR THE DEGREE IN BACHELOR OF SCIENCE INFORMATION AND COMMUNICATION TECHNOLOGY

1st YEAR 2ND SEMESTER 2024/2025 ACADEMIC YEAR MAIN CAMPUS EXAMS

COURSE CODE: ITB1108

COURSE TITLE: SYSTEMS THEORY

VENUE: ……LAB 8……STREAM…….

DATE: ……23/4/2025…… EXAM SESSION: ……15.00-17.00.

TIME: 2.00 HOURS

INSTRUCTIONS:

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1) **Answer QUESTION ONE (Compulsory) and any other two questions**
2) **Candidates are advised not to write on the question paper**
3) **Candidates MUST hand in their answer booklets to the invigilator while in the examination room**
4) **Mobile phones are NOT allowed in the examination room.**

QUESTION 1 (30 Marks)

a) Define the term *system theory* and describe its key characteristics. (6 marks)
b) Explain the concept of a *system boundary* and its importance in system analysis. (6 marks)
c) Discuss the relevance of General Systems Theory to Information Systems. (6 marks)
d) Explain how feedback and control mechanisms operate in a system. Provide examples. (6 marks)
e) Differentiate between open and closed systems with relevant examples. (6 marks)

QUESTION 2 (20 Marks)

a) Describe the systems development life cycle (SDLC) in the context of Systems Theory. (10 marks)
b) Discuss the role of a systems analyst in applying Systems Theory to real-world business problems. (10 marks)

QUESTION 3 (20 Marks)

a) Identify and explain five components of a system. (10 marks)
b) Discuss how the concept of *emergence* applies in complex systems. Give two practical examples. (10 marks)

QUESTION 4 (20 Marks)

a) Explain how systems thinking can be used to solve complex organizational problems. (10 marks)
b) Discuss the difference between *hard* and *soft* systems methodologies. (10 marks)

QUESTION 5 (20 Marks)

A university faced challenges integrating multiple information systems, resulting in duplication of data and inconsistent reports.

a)
Using Systems Theory principles, explain what may have gone wrong. (10 marks)
b) Suggest best practices that could have prevented such issues. (10 marks)