



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN
BUSINESS INFORMATION SYSTEMS**

4th YEAR 1ST SEMESTER 2016/2017 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: IIS 3419

COURSE TITLE: SYSTEMS THINKING & BUSINESS DYNAMICS

EXAM VENUE:

STREAM: IIS

DATE:

EXAM SESSION:

TIME: 2.00 HOURS

INSTRUCTIONS:

- 1. Answer Question 1 (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**

QUESTION ONE

- a) Define systems thinking. (3 Marks)
- b) Using appropriate examples identify four main types of systems. (4 Marks)
- c) Systems' thinking is concerned with 'connectedness' as well as 'wholeness' in problem analysis and solving. (4 Marks)
- d) There are four paradigms of systems thinking, namely; Hard Systems Thinking, Soft Systems Thinking, Critical Thinking, Multimodal Systems Thinking. Describe each paradigm (8 Marks)
- e) What are the effects of dynamic complexity in a system? (5 Marks)
- f) Simulation models are not the only models that can be used for understanding and improving the real world. There exist other modeling approaches. Why would simulation be used in preference to these other modeling approaches? (6 Marks)

QUESTION TWO

- a) Please discuss the merits of Hard systems and soft systems approaches in solving computer-based information Systems problems (6 Marks)
- b) The modelling process can be divided into four stages; List and discuss the stages. (8 Marks)
- c) What is systems dynamics modeling (6 Marks)

QUESTION THREE

- a) The advantages of Systems Dynamics as a problem-solving methodology are that it captures both the quantitative and qualitative. Discuss (6 Marks)
- b) Systems Dynamic's simulation models can be considered as a representational system in a broad sense as a language that allows us to view and describe reality. There are three types of knowledge that we may represent .Outline and discuss them (8 Marks)
- c) Systems Dynamic's can support business process description, assessment and prediction. Explain (6 Marks)

QUESTION FOUR

- a) Among the most compelling reasons for using simulation are the benefits gained by managers. Explain any THREE benefits. (6 Marks)
- b) Systems Thinking Diagrams are composed of only two components, elements and influences. Draw and explain how they work (6 Marks)

- c) There is a wide range of computer software which is available for use in business process modelling and analysis. Give three examples of these software's and their application areas (3 Marks)
- d) There are five stages in simulation modeling. Describe each stage (5 Marks)

QUESTION FIVE

- a) The word "problem statement" is used in preference to research question(s) because systems' modelling being a subset of Information Systems requires solving problems rather than answering questions. The statement of the problem is an important early phase in the science of decision-making. There are several characteristics of a good problem statement: state and explain these characteristics (4 Marks)
- b) Conceptual modelling enables understanding the nature of the problem and to propose a model that is suitable for tackling it. Conceptual modelling consists of sub-processes: list and discuss the sub processes (4 Marks)
- c) There is a wide variety of reasons for undertaking simulations of software process models. Simulation is an aid to decision making. Simulation helps in risk reduction and helps management at the strategic, tactical and operational levels. However the most important use of simulation in software project management can be grouped into six categories. State and discuss them. (12 Marks)