MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR SPECIAL / SUPPLEMENTARY EXAMINATIONS FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 101/SIT262: SYSTEMS ANALYSIS AND DESIGN

DATE: 25/8/2022   **TIME: 8.30-10.30 AM**

INSTRUCTIONS:

This paper consists of FIVE questions
Answer question *ONE* and other *TWO* questions *in this paper.*

QUESTION ONE (30 MARKS)

(a)   (i)   Define the term *system thinking* as used in Systems Analysis and Design. (2 marks)

(ii)   Describe **two** system stakeholders in a Supermarket Management Information

System.   (4 marks)

(b)   (i)   Using entities ***Doctor*** and ***Patient*** represent each of the following types of

relationships between the two entities in entity relation diagrams.

I.   one to many;

II.   many to many.   (2 marks)

(ii)   Explain **two** characteristics of a closed system.   (4 marks)

(c)   (i)   State **four** types of user interfaces that could be incorporated in a system. (2 marks)

(ii)   Describe the stages in prototyping system development methodology.   (4 marks)

(d)   (i)   Explain **two** types of application backlog in systems analysis and design. (2 marks)

(ii)   Describe **two** general principles of systems.   (4 marks)

(e)   (i)   Compare *interview* and *observation* methods of system requirements gathering.

(3 marks)

(ii)   A system analyst preferred to use questionnaires to gather system requirements.

Outline **three** reasons that could have led to this preference.   (3 marks)

QUESTION TWO (20 MARKS)

(a)   (i)   Outline **one** reason for carrying out a feasibility study in systems analysis and design.   (1 mark)

             (ii)   Explain **two** types of feasibility studies carried out before the development of a system.   (4 marks)

(b)   A system analyst plays several roles in system development. Explain **two** such roles.

                                                                           (4 marks)

(c)   A leading telecommunication company in Kenya has upgraded its systems in line with the current trend and would like to move its subscribers to the new system.

             (i)   Identify the most appropriate change over method the company could use. (1 mark)

             (ii)   Explain **two** challenges associated with the method identified in (i).   (4 marks)

(d)   Needy students are at liberty to apply for county government sponsorship. To be considered a student fills a form which is countersigned by the local administrator and a religious leader. The student then forwards the form to the dean of student for authentication. After authentication the dean of student returns the form to the student who then submits it to the county government office. A clerk in the office receives the form and checks it for completion, stamps and records it in the received form book.

             Represent this narrative in a *use case* diagram.   (6 marks)

QUESTION THREE (20 MARKS)

(a)   (i)   Explain the term *artificial intelligence* as used in systems analysis and design.

                                                                      (2 marks)

             (ii)   Outline **two** advantages of a decision support system to an organization.   (2 marks)

(b)   A university has outsourced its student management information system. Explain **three** advantages it could get from this move.   (6 marks)

(c)   Distinguish between *spiral* and *waterfall* methods of system development.   (4 marks)

(d)   A football match is played between two teams A and B. During the first 90 minutes either of the teams could win. If the teams draw then the match goes for extra time and the teams keep on playing. model this scenario using a decision table.   (6 marks)

QUESTION FOUR (20 MARKS)

(a)   Outline **two** pairs of differences between an *expert system* and an *executive support system*

(4 marks)

(b)   (i)   Explain each of the following terms as used in Human Computer Interaction.

I.   usability;

II.   fit.   (4 marks)

(ii)   A newly chartered University would like to acquire a Student Management Information System. Describe **two** acquisition methods it could use other than outsourcing.   (4 marks)

(c)   Explain each of the following terms as used in object-oriented systems design and analysis.

(i)   Polymorphism;

(ii)   inheritance.   (4 marks)

(d)   A class **Vehicle** has two subclasses **Car** and **Lorry**. **Vehicle** has attributes *Make*, *Model*, *YearofManufacture* and *Size*. **Car** has *RegistrationNumber* and *Capacity*. **Lorry** has *Axelload* and *Tonnage.*

Represent this information in a class diagram.   (4 marks)

QUESTION FIVE (20 MARKS)

(a)   (i)   Define the term *problem identification* as used in System Analysis and Design.

(2 marks)

(ii)   Explain **three** circumstances under which an organization could develop a new system.   (6 marks)

(b)   An organization developed a system its use, however after some time it realized that the system was not worth its development cost. Explain **three** methods the organization could have used to reach this conclusion.   (6 marks)

(c)   (i)   A system should be maintained in order to keep it working well. Outline **three** types of maintenance that could be carried out.   (3 marks)

(ii)   Outline **three** reasons that could make an information system development project fail.   (3 marks)