MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 101: SYSTEMS ANALYSIS AND DESIGN

DATE: 6/5/2019 **TIME: 11.00-1.00 PM**

INSTRUCTIONS

Answer **Question ONE and any other TWO questions.**

QUESTION ONE (30 MARKS)

(a) (i) Define the term *system analysis*. (2 marks)

(ii) Describe **two** system stakeholders in an airline booking system. (4 marks)

(b) (i) Masomo college allocates units to lecturers every semester. Using entities *unit* and *lecturer*, model each of the following types of relationships using an entity relationship diagram:

I. One to One;

II. One to Many. (2 marks)

(ii) Outline **two** differences between *probabilistic* and *deterministic* systems. (4 marks)

(c) Students in a university interacts with the management through a management information system. Outline **four** interaction styles that could be used in such a system. (4 marks)

(d) CopyTec company uses waterfall and spiral methodology to develop systems.

(i) Outline **two** advantages of using each of the methodologies. (4 marks)

(ii) Outline **two** circumstances under which each methodology would be used. (4 marks)

(e) One of the activities undertaken in the system development life cycle is feasibility study. Explain **three** types of this study. (6 marks)

QUESTION TWO (20 MARKS)

(a) (i) Explain the term *office automation* as used in Systems Analysis and Design. (2 marks)

(ii) With the aid of a diagram, describe the components of an expert system. (4 marks)

(b) A company outsourced the development of a system. Outline **four** benefits the company could accrue from this outsourcing. (4 marks)

(c) Distinguish between *transaction processing systems* and *management information systems*. (4 marks)

(d) A telecommunication company used parallel changeover method to implement a new system.

(i) Describe this changeover method. (2 marks)

(ii) Explain **two** advantages of using this method. (4 marks)

QUESTION THREE (20 MARKS)

(a) Outline **two** roles of a system analyst in an organization. (2 marks)

(b) Explain **two** benefits of carrying out a feasibility study before developing a system. (4 marks)

(c) A company installed a new information system to ease its operations. Within a few days the system users reported challenges with the system. Explain **three** such challenges. (6 marks)

(d) (i) Organizations implement systems in order to gain competitive advantage. Outline **three** forces that motivate organizations to seek this advantage. (3 marks)

(ii) A customer seeking to be connected to the national electricity grid fills a request form and submits it to the local office. A clerk in the office checks the form for completion and enters it in the company's database. A supervisor allocates a surveyor who surveys the area, prepares a report and submits the report to the office. A cashier computes the amount to be paid by the customer and sends the bill to the customer. Once the customer pays, the supervisor allocates a technician who connects the power.

Model this scenario using *use case* diagram. (5 marks)

QUESTION FOUR (20 MARKS)

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

(i) Affordance; (2 marks)

(ii) flexibility. (2 marks)

(b) Machakos university uses a manual security system, the university has decided to automate the system.

(i) Outline **two** reasons that could have informed this decision. (2 marks)

(ii) Explain **three** circumstances that could lead to the failure of the automation process. (6 marks)

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

(i) Polymorphism;

(ii) Inheritance. (4 marks)

(d) A university has a class Student with two subclasses GSSP and PSSP. Student has attributes *Regno*, *Name*, *Course, Gender* and *Age*. GSSP has attributes *sponsor, county subcounty*. PSSP has attributes *status*, *class*, and *Sponsor.*

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

QUESTION FIVE (20 MARKS)

(a) (i) Define the term *documentation* as used in System Analysis and Design. (2 marks)

(ii) Explain **two** types of documents that should be created when a new system is developed. (4 marks)

(b) A company carries out routine maintenance of its systems. Explain **two** benefits the company could accrue from this maintenance. (4 marks)

(c) Distinguish between *phased* and *pilot* system implementation changeover methods (4 marks)

(d) A technical support team has received printer conditions as follows: The printer prints, A red light is flashing and printer is recognized by the computer. The actions include Check the power cable, Check the printer-computer cable, Ensure printer software is installed, Check/replace ink and Check for paper jam.

Model this scenario using a decision table. (6 marks)