SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SUPPLEMENTARY EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO101: SYSTEMS ANALYSIS AND DESIGN

DATE: **Time:**

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

1. (a) (i) Define the term *system design* as used in Information technology. (2 marks)
(ii) Citing an example describe a closed system as used in system analysis and design. (4 marks)

(b) (i) Using entities ***Student*** and ***Lecturer*** show each of the following types of relationships between the two entities in entity relation diagrams.
I. one to many;
II. many to many. (4 marks)

(ii) ABC company Ltd recently installed a system to automate its operations. The system has some faults that needs maintenance. Explain **three** types of maintenance that can be carried out on the system. (6 marks)

(c) (i) Describe the most appropriate input method for persons with:
I. visual impairment;
II. missing fingures. (2 marks)

(ii) Explain **three** methods that could be used to design a system. (6 marks)

(d) A certain University has estimated that its enrollment has a 30% chance of being high, a 40% chance of being fair and 30% chance of being low. The cost of advertising for its courses is Ksh. 300000. It is also estimated that a return of Ksh. 5 million, 3 million and 1 million will be realised if the chances are high, fair or low respectively.
Using a decision tree, model this case. (6 marks)

2. (a) (i) Define the term *feasibility study* as used in systems analysis and design. (2 marks)
(ii) Describe **two** types of feasibility studies that may be carried out by a system analyst. (4 marks)

(b) John, a system analyst has created a new system for a client. Explain **three** change over methods that may be used to implement the system. (6 marks)

(c) A university requires that an applicant applies for a course to the registrar who then admits the applicant. Once admitted the student applies for a hostel room to the dean of students who may allocate a room to the student. The student is then shown the room by the housekeeper.

Model this scenario using *use case* diagram. Use extends where appropriate. (8 marks)

3. (a) (i) Define the term *artificial intelligence* as used in systems analysis and design. (2 marks)
(ii) Describe **two** components of an expert system. (4 marks)

(b) Explain **three** reasons that would necesitate the creation of a new system in an organization. (6 marks)

(c) Read the case below and use it to answer the question that follows:-

Infant passengers under two years old are offered a discount of 80% on domestic flights. Infant passengers under two years old are offered a discount of 70% on international flights. Youth passengers (between two and sixteen) are offered a discount of 10%, for any kind of destination. Passengers who make reservation five months before their journey are offered a discount of 10%. For international flights, passengers are offered 15% discount if they travel during off-seasons. There would be no discount for international flights, except that when the passenger is an infant passenger or when travelling during off-season. Frequent flyer enjoys a discount of 15%. The amount of discount is accumulated. The maximum amount of discount for infant passengers is 80% .The maximum amount of discount for non-infant passengers is 20%.

Create a decision table for the case. (8 marks)

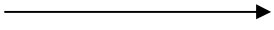
4. (a) (i) Explain each of the following terms as used in Human Computer Interactions.
I. fit;
II. effeciency. (4 marks)

(ii) Distinguish between *acceptability* and *accessibility* as used in Human Computer Interaction. (4 marks)

(b) A computer science graduate has being offered two jobs A and B. Job A requires the graduate to spent Ksh. 70,000 in accomodation and travel while Job B requires Ksh. 30,000 per month. Monthly salaries of Ksh 180,000 and Ksh. 130,000 is attached to Jobs A and B respectively.

Using a decision tree, advise the graduate on the job offer to take. (6 marks)

(c) Amani used the following objects to represent various relationships during system design.

(i) 

(ii) 

Name the type of relationship represented by each object. (2 marks)

(d) A class *Student* has two subclasses *GSS* and *PSS. Student* has attributes *regno*., *name*, *course* and *level. GSS* has *Government*, *County* and *Constiuency*. *PSS* has *Parent* and *Guadian.*

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

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

(ii) Explain each of the following types of system testing.

I. Unit testing;
II. Beta testing;
III. Usability testing. (6 marks)

(b) Distinguish between *functional* and *nonfunctional* requirements as used in System Analysis and Design. (4 marks)

(c) A student was required to develop a system as part of his course work. Describe **two** fact recording methods that he could use. (4 marks)

(d) Distinguish between *system implementation* and *system maintenance*. (4 marks)