

QUESTION 1 (30 MARKS)

You have been asked to spearhead a team assigned with responsibility to develop the Student Information System (SIS). The goal of this mega project is to create an integrated information technology environment for students, parents, HOD/Dean, faculty, Staff and other non teaching staff of the institution. This system will integrate the following modules: Centralized Admission, Student Enrollment, University Examination System, Health Center, Engineering & Estate, General Administration, E- Learning, Finance, and Human Resource. The system allows the admin to add students, faculties and any other events. It allows a faculty to enter or input student's attendance into the database which can later be viewed by students and faculties. The students can view attendance through a separate student login. The admin can upload marks and the timetables for various departments for exam. The time table is then available to be viewed by faculties and students on the web portal. The students can enroll for courses, view their fee balance, pay fees, download transcripts, update their contact address, and download assignments and many others. Teaching and non-teaching staff can download their pay slip, check salary, update their contact information, take attendance, upload course work, upload grades and many more. Information System (SIS) should meet accountability demands with comprehensive student information systems. It should be easy-to-use and integrated. College administration applications reduce time spent on administrative tasks so that focus is on raising student achievement. Student Information Systems accept process and generate reports accurately and any point of time any user can get the information.

- a) Using a table generate a Use-Case Glossary showing at least six Use-Cases and corresponding actors **(6 Marks)**
- b) Sketch a Use-Case diagram of SIS using the Use-Cases and Actors identified above **(6 Marks)**
- c) Sketch a Context diagram of the system **(6 Marks)**
- d) Sketch a data flow diagram of SIS **(6 Marks)**
- e) Draw an ERD for the system. **(6 Marks)**

QUESTION 2 (20 MARKS)

The purpose of this case study is to give you an opportunity for information systems students to apply data modeling, process modeling, and user interface design skills. You have been requested to design an information system for the local KMovie Theater following an embarrassing incident involving H.E The Governor of KCounty. The Governor through a proxy had reserved a ticket for him and his family. However, due to an oversight which turns out to be rather frequent, his tickets were sold to another patron. Fortunately for the Governor and his wife, who are celebrating their wedding anniversary, the box office manager found two box seats which had not been claimed. In talking with the box office manager, the Governor thought about you and how you could perhaps help the theatre avoid this type of problem in the future. Your

role is to design and build a system to help keep track of ticket sales, and hopefully help the theatre become more efficient and improve customer satisfaction.

- a) Draw a Use-Case diagram for the Local KMovie Theater system **(7 Marks)**
- b) Draw a Class Diagram of the system. **(7 Marks)**
- c) Draw a diagram showing the input and output screen of the system **(6 Marks)**

QUESTION 3 (20 MARKS)

In this case study you are required to identify the information systems requirements for a new system called Customer Management System (CMS) that should be defined from the system users' perspectives. What we want to get out of this meeting is consensus on everything the Customer Management System needs to do and who will be using each part of that functionality. Clients need to be able to service requests. Technicians need to enter their records of work on those requests. We also need to track hardware components installed in a client's equipment and software configuration information. We'll also need to be able to set up clients and even employees. One thing I think would be helpful would be for the techs to be able to view a list of their unresolved requests and view the complete history of any request and all the work done on it. As a manager I'd like to see that, too, to see what's going on. Of course, each Tech would see all of his or her own unresolved requests. I'd like to see everyone's unresolved requests. First, I should only get to any of this functionality after I logon. We want to keep this secure from people other than clients and employees. So If I view unresolved requests, the system shows me a list depending on who am I. I also think that more than just clients need to be able to add service requests. There's also the component end of it. Viewing the list of components installed in a piece of equipment. Adding a new component to a piece of equipment. Or for that matter, installing a completely new piece of equipment for a client.

- a) Identify at least six Use Cases and the corresponding actors **(6 Marks)**
- b) Draw a sequence diagram for one of the Use-Cases **(6 Marks)**
- c) Using an illustration briefly discuss the Use Case Diagram for the system above **(8 Marks)**

QUESTION 4 [20 MARKS]

More than 2000 patients are registered with a local health centre. The centre employs a number of general practitioners (i.e. doctors) and a few receptionists. Patients are officially registered with one doctor but can arrange appointments with any available one. These appointments may subsequently be cancelled. Some appointments result in one or more prescriptions. New patients are registered by a receptionist. When a patient is registered he/she provides his/her details such

as name, date of birth, address, etc., and receives a unique patient number. To book an appointment a patient should contact a receptionist. The patient provides his/her number (or date of birth) and the receptionist provides a list of available time slots for appointments. The appointment is booked with the patient's doctor or if the patient's doctor is not available with any available doctor. The date and time of the booked appointment are given to the patient as a confirmation. Patients can cancel booked appointments by contacting a receptionist who will cancel appointments on behalf of patients. A patient who attends an appointment should check in first using a special terminal located in the waiting area of the Health Centre. The patient inputs his/her number (or date of birth). The system checks the details and confirms that the patient has been checked in. Doctors record appointment outcomes and details of prescriptions (if any) during the appointments i.e. all prescriptions issued by doctors are recorded on the patient's record. Patients who leave the area where the Health Centre is located are de-registered by receptionists.

- a) Produce a context diagram of the Medical Appointments System described above. **(7 Marks)**
- b) Draw an Entity Relationship Diagram (ERD) for this system. **(7 Marks)**
- c) Produce a sequence diagram for the use case 'Check in' in the Medical Appointments System described above. A brief description of this use case is given below. **(6 Marks)**
"The patient enters his/her date of birth. The system searches the patient's and appointment's details and displays the patient's name, the appointment details (date, time) and the doctor's details (name, room no.)".

QUESTION 5 [20 MARKS]

A leading eConsultancy company has hired you for a 2 year period to lead a team of young software developers in the development and implementation of an E-Tracking Systems for their chain of Trucks that transport goods across Kenya Your responsibility will be a system analyst. You are expected to work with a project team. Using your knowledge of System Development Life cycle briefly the discuss the activities and relevant deliverables in each of the following phases

- i) Planning phase. **(4 Marks)**
- ii) Analysis phase. **(4 Marks)**
- iii) Design phase. **(4 Marks)**
- iv) Implementation phase. **(4 Marks)**
- v) Testing phase. **(4 Marks)**