



**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 INFORMARTION SYSTEMS**  
**3<sup>RD</sup> YEAR 1<sup>ST</sup> SEMESTER 2023/2024 ACADEMIC YEAR**  
**MAIN CAMPUS**

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**COURSE CODE: ITB 2305**

**COURSE TITLE: SYSTEM DESIGN**

**EXAM VENUE:LR5      STREAM: BUSINESS INFORMATION SYSTEMS**

**DATE:6/1/25      EXAM SESSION:14-16.00 PM**

**TIME:2 HRS**

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**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 1 (30 MARKS)

You have been asked to lead a team of young software developers in the development and implementation of a Student Attendance System for JOOUST. The functions of the system include:

- Automated Attendance Recording: Efficiently records student attendance using various methods like biometric scanning, RFID cards, or manual entry.
- Real-Time Tracking: Provides instant updates on student presence, absence, or tardiness.
- Data Storage and Retrieval: Stores attendance records for easy access and analysis.
- Reporting and Analytics: Generates comprehensive reports on attendance patterns, identifying trends and areas for improvement.
- Integration with Other Systems: Connects with school management software, learning management systems, or communication platforms for seamless data sharing.
- Parental Notifications: Sends automated notifications to parents about their child's attendance, ensuring transparency and involvement.
- Absence Management: Helps track and manage absences due to illness, excused absences, or unauthorized absences.

- a) Using your knowledge of System Development Life cycle briefly 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)
- b) Briefly discuss any five advantages of this information system. (5 Marks)
- c) Discuss any five preparations you would require in order to conduct an interview for requirement analysis. (5 Marks)

## QUESTION 2 (20 MARKS)

You have been hired as a system analyst in a project involving the development of the JOOUST Transport and Fleet Management System to hel address the issues with expred inspection, poor accountability of fuel usage and maintenance service.

- a) Identify the problem. Provide a justification for your answer **(2 Marks)**
- b) Discuss at least five roles the system analyst **(5 Marks)**
- c) Identify any four skills you would require as a system analyst to deliver effectively **(4 Marks)**
- d) With the help of a diagram discuss the Use Case for the above system **(9 Marks)**

## QUESTION 3 (20 MARKS)

You have been hired to lead a team of IT developers to develop a Course Management System for Jaramogi Oginga Odinga University of Science and Technology using UML tool called Visual Paradigm for UML.

- 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]

- a) Universities play a key role in the development of human resource for all production sectors of the economy through training and conducting research and development for the generation, curation and dissemination of new knowledge. NACOSTI is mandated with research and innovation in universities in Kenya. They developed what is considered the research priority areas in Kenya. Briefly discuss in details these research areas. **(10 marks)**
- b) Briefly discuss five research methodologies you would apply in a Research and Development project. **(10 marks)**

### QUESTION 5 [20 MARKS]

More than 5000 students attend the JOOUST Health Clinic. The Clinic employs the Chief Medical Officer, two doctors, three Clinical Officers, eight nurses (Full time and Part-time) and a few receptionists. Patients can arrange appointments with any available one. These appointments may subsequently be canceled. 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 at the receptionist room of the Clinic.

- a) Draw an Entity Relationship Diagram (ERD) for this system. **(10 Marks)**
- a) 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. **(10 Marks)**