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**TECHNICAL UNIVERSITY OF KENYA**

**FACULTY OF APPLIED SCIENCES AND TECHNOLOGY**

**SCHOOL OF COMPUTING & INFORMATION TECHNOLOGY**

**END OF SEMESTER EXAMINATION SERIES**

**FIRST SEMESTER EXAMINATIONS 2018/2019**

**THIRD YEAR EXAMINATION FOR THE DEGREE OF**

**BACHELOR OF TECHNOLOGY IN COMPUTER TECHNOLOGY**

**BACHELOR OF TECHNOLOGY IN COMMUNICATION AND COMPUTER NETWORKS**

**ECSI 3105 / ECCI 3105: OBJECT ORIENTED ANALYSIS AND DESIGN**

**Time: 2 Hours**

**Instructions to candidates:**

This paper consists of FIVE Questions.

Answer Question ONE [30 Marks] and any other TWO Questions [20 Marks Each].

Write your college number on the answer sheet.

This paper consists of 3 printed pages

**Candidates should check the question paper to ascertain that allthe pages are printed as indicated and that no questions are missing.**

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QUESTION ONE [30 MARKS] COMPULSORY

1. Define the term UML (2 Marks)
2. Explain the phases of OO software development (6 Marks)
3. With the help of a diagram explain the notation of an object diagram (4 Marks)
4. Explain the key benefits of UML (4 Marks)
5. Explain the principles of object oriented development approach (4 Marks)
6. Distinguish between the following
   * 1. Object and dynamic modeling
     2. Links and Association
     3. OOA and OOD (6 Marks)
7. With the help of examples explain private, public and protected visibility modes as used in classes (4 Marks)

QUESTION TWO [20 MARKS]

1. Compare OOAD & SSAD (4 Marks)
2. With the help of a diagram explain the types of inheritance (8 Marks)
3. A hockey league is made up of at least four hockey teams. Each hockey team is composed of six to twelve players, and one of the players is the captain of the team. A team has a name and a record. Players have a number and a position. Hockey teams play games against each other. Each game has a score and a location. Teams are sometimes lead by a coach. A coach has a level of accreditation and a number of years of experience, and can coach multiple teams. Coaches and players are people with names and addresses. Using the narrative above draw a class diagram and label all links and associations (8 Marks)

QUESTION THREE [20 MARKS]

1. Illustrate the components of a use case diagram (6 Marks)
2. Discussany three building blocks of UML (4 Marks)
3. The author completes an online form that requests the user to input author name, correspondence address, email and, title of paper. The system validates this data and, if correct, asks the author to submit the paper. The author then browses to find the correct paper on their system and submits it. Once received and stored, the system returns to the author a reference number for the paper. Authors may submit as many papers as they like to be considered for acceptance to the conference up until the deadline date for submissions. Papers are allocated to referees for assessment. They review each paper and submit their decisions to the system. Once the programme organizer accepts the decisions,the authors are informed via email. Accepted papers are then schedule to be presented at a conference. This involves allocating a date, time and venue for the paper presentation.

Given this description, Analyze the scenario and draw a use case diagram (10 Marks)

QUESTION FOUR [20 MARKS]

1. Describe the three major elements of the UML conceptual Model (6 Marks)
2. Discuss any four advantages of Object Oriented Analysis over Structured Analysis approach

(8 Marks)

1. With the help of a well labeled sequence diagram illustrate the transactions of an ATM machine of a bank (6 Marks)

QUESTION FIVE [20 MARKS]

1. Compare and contrast Object Oriented Databases and Relational Databases (4 Marks)
2. Explain the features of a DFD (8 Marks)
3. Given the narrative below draw a DFD for Hoosier inventory system (8 Marks)

In Hoosier inventory system, three sources of data come from outside: suppliers, the food-ordering system inventory report, and stock on hand. Suppliers provide invoices as input, and the system returns payments and orders as outputs to the suppliers. Both the inventory report and the stock-on-hand amounts provide inventory counts as system inputs. When the Manager receives invoices from suppliers, he records their receipt on an invoice log sheet and files the actual invoices in his box file. Using the invoices, the Manager records the amount of stock delivered on the stock logs, which are paper forms posted near the point of storage for each inventory item.

Notice that the minimum order quantities—the stock level at which orders must be placed in order to avoid running out of an item—appear on the log form. The stock log also has spaces for entering the stock opening amount, amount delivered, and the amount used for each item. Amounts delivered are entered on the sheet when the Manager logs stock deliveries; amounts used are entered after the Manager compares the amounts of stock used according to a physical count and according to the numbers on the inventory report generated by the food-ordering system.

We should note that Hoosier has standing daily delivery orders for some perishable items that are used every day, such as buns, meats, and vegetables. the Manager uses the minimum order quantities and the amount of stock on hand to determine which orders need to be placed. He uses the invoices to determine which bills need to be paid, and he carefully records each payment.