University of Ruhuna - Faculty of Technology
Bachelor of Information and Communication Technology Honours Degree
Level 2 (Semester I) Examination, June/July 2023
Academic year 2021/2022

Course Unit: ICT2133 System Analysis and Design and Usability (Theory) Duration: 2 ½ hours
Repeat Examination
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- Answer all **Five (05)** questions.
- Calculators are allowed to be used for calculations.

1.

   a.

      i.   Define the term **System** using your own words.

      ii.   Identify six (06) main elements of a system and briefly explain any three (03) identified elements.

      iii. Define the term Information System (IS) and list down three (03) common objectives of linking business to IS.

   b. "A system analyst must be able to work with people with all descriptions and be experienced in working with computers."

      i.   List down four (04) personal qualities that are required to become a system analyst.

      ii.   Identify the three (03) primary roles of a System Analyst and briefly explain each role.

2.

   a. The Software Development Life Cycle (SDLC) is a phased approach to solving business problems.

      i.   List the generic phases of SDLC in the correct order.

      ii.   Briefly explain the difference between **Technical Feasibility** and **Operational Feasibility**.

      iii. **Observations** and **Questionnaires** are two (02) **Fact-Finding techniques**.
          Identify three (03) advantages and two (02) disadvantages of each technique.

b.

    i.   Briefly explain what software testing is.

    ii.   White box testing is a testing strategy that deals with the internal logic and structure of the code.
Identify two (02) advantages and two (02) disadvantages of white box testing.

    iii.   "Direct approach in system conversion is better than parallel running for small systems".
Discuss whether you agree or disagree with the above statement.

3.

  a.

    i.   What is Project Management?

    ii.   List three (03) factors affecting the duration of a project.

    iii.   What is Slack Time?

  b.

    i.   Construct a Gantt chart to satisfy the requirements shown in the table below.

Activity	Predecessor	Estimate Time in Weeks
Start	-	0
A	Start	3
B	A	4
C	Start	4
D	B, C	8
E	B, C	5
F	E	3
G	D	3
H	F, G	2
I	H	2

    ii.   Draw a PERT diagram for the table given in b) ii) above.

    iii.   Find the critical path for this project and its duration.

4.

   a. Consider the following scenario to answer questions **ii** and **iii**.

A Pizza company requires to develop an online Pizza delivery order processing system. The system should be easy to use by its employees and should provide a good response time of less than 5s. Orders are received from customers online who must state the items and expected delivery deadlines. The orders are recorded and prioritized according to preparation time, transport capacity, delivery deadlines, and time of order. This system will output the order price, and the delivery time. The customer then has the option to confirm or reject the order.

     i. Briefly explain the difference between functional and non-functional requirements.

     ii. Identify three (03) functional requirements of the software system.

     iii. Identify two (02) non-functional requirements of the software system.

   b. Data Flow Diagrams (DFDs) illustrate the way in which the data is passed around the system.

     i. Identify the four (04) major components of DFDs and briefly describe each of the identified components.

     ii. Consider the following scenario and draw a Context Level diagram.

A Real Estate Inc. (AREI) sells houses. People who want to sell their houses sign a contract with AREI and provide information on their house. This information is kept in a database by AREI, and a subset of this information is sent to the citywide multiple listing service used by all real estate agents. AREI works with two types of potential buyers. Some buyers have an interest in one specific house. In this case, AREI prints information from its database, which the real estate agent uses to help show the house to the buyer (a process beyond the scope of the system to be modeled). Other buyers seek AREI's advice in finding a house that meets their needs. In this case, the buyer completes a buyer information form that is entered into a buyer database, and AREI real estate agents use its information to search AREI's database and the multiple-listing service for houses that meet their needs. The results of these searches are printed and used to help the real estate agent show houses to the buyer.

     iii. Explode the Context Level diagram in b) ii) to a Level 0 DFD.

5.

    a. The quality of system input determines the quality of system output.

        i.   Identify five (05) input design objectives.

       ii.   List down three (03) advantages of a good form design.

      iii.   Using two (02) key points briefly explain how to appropriately use icons in screen design.

    b. Outputs deliver information to the users.

        i.   Identify four (04) output design objectives.

       ii.   Identify two (02) advantages and two (02) disadvantages of the following output methods.
            I. Printer
            II. Display Screen
            III. Audio output and podcasts
            IV. Mobile device

      iii.   Write down five (05) factors that need to be considered when choosing the output technology.

---- **End of the Paper** ----