SABARAGAMUWA UNIVERSITY OF SRI LANKA
FACULTY OF COMPUTING
DEPARTMENT OF COMPUTING AND INFORMATION SYSTEMS

086

BSc Hons DEGREE PROGRAMME IN COMPUTING AND INFORMATION
SYSTEMS

IS 2019/2020 SEMESTER IV EXAMINATION MARCH/APRIL 2024

IS 4106 – SOFTWARE ARCHITECTURE

Time allowed: **THREE (03) Hours**

INSTRUCTIONS TO CANDIDATES:

This paper consists of FIVE (05) questions. Answer ALL questions.

The marks in brackets indicate the weight given to each part of the question.
Write your Index No. clearly in all places where appropriate.
Write clearly in English and use blue or black ink.
Non-programmable calculators are ALLOWED in this examination.
No clarifications will be provided on the given questions.
Strike a line through all unused pages in the answer booklet/sheets.
Cross out all scratch paper and hand it in at the time of collection.

1) a) Briefly describe what is meant by Software Architecture and list down the **FIVE (05)** Contributory factors. **[20 Marks]**

b) Compare between the System architecture and the Enterprise architecture. **[20 Marks]**

c) Consider a social media platform like Facebook. Users can create profiles, connect with friends, post updates, and interact with content shared by others. The platform also includes features like messaging, notifications, and privacy settings. **[60 Marks]**

Explain using the Kruchten's 4+1 View Model.

2) a) What are the main steps of constructing a component diagrams? **[20 Marks]**

b) Differentiate ball connectors and socket connectors with the use of an example. **[30 Marks]**

c) Using a package diagram, explain how a customer can check their account balance in a banking system. **[50 Marks]**

Include the main packages involved, such as Authentication Management, Account Management, and Customer Interface, and illustrate how these packages interact to facilitate the process.

3) a) Briefly describe the Decomposition and Generalization. **[20 Marks]**

b) Explain the Implicit invocation system by using a suitable example. **[30 Marks]**

c) A home banking website is a system that allows bank customers to manage their accounts using the internet. This system is usually connected to the bank's core System. **[50 Marks]**

Draw and explain the structure of the Layered Architecture for the home banking website.

[P.T.O]

4) a) A pipe and filter architectural style has independent entities called, pipe and filter. List down the advantages and disadvantages of pipes and filters [20 Marks]

b) Write short note on the following terms coming in event based system, [40 Marks]

    i.   Components

    ii.   Connectors

    iii. Configurations

    iv. Underlying computational model

c) Describe the role of each component (Model, View, Controller) in the (MVC) architecture of a web application? [40 Marks]

5) a) Quality attributes are measurable properties of a system used to measure a system's design, run time performance, and usability. [20 Marks]

List down the quality attributes from the Development team perspective and End users perspective. (05 from each)

b) A customer needs to wait for the system to finish processing previous orders for concert tickets before they are able to send their purchase request. The system is unavailable for customers if the system can't accept their request for tickets, which has a negative effect on the availability quality attribute of the system. [30 Marks]

Explain the above situation using the scenario components.

c) A company is developing a new e-commerce platform and wants to ensure that the architecture meets their business goals and quality attribute requirements. They decide to use the Architecture Tradeoff Analysis Method (ATAM) process to evaluate the architecture. [50 Marks]

Explain how the ATAM process could be applied.