



FINAL EXAMINATION

**BACHELOR OF INFORMATION TECHNOLOGY (HONOURS) IN COMPUTER
APPLICATION DEVELOPMENT**

COURSE : SOFTWARE DEVELOPMENT PARADIGMS

COURSE CODE : SWC2623

DURATION : 3 HOURS

INSTRUCTIONS TO CANDIDATES:

1. This question paper consists of **FOUR (4)** questions.
2. Answer **ALL** questions in the Answer Booklet provided.
3. Please check to make sure that this examination pack consists of:
 - i. The Question Paper
 - ii. An Answer Booklet
4. Do not bring any material into the examination hall.
5. Please write your answer using permanent ink.

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SECTION

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DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO

This question paper consists of 4 printed pages including the front page

QUESTION 1

- a. Explain why programming paradigms are important in software development.
(4 marks)
- b. Describe **FOUR (4)** main phases in the Waterfall software development model.
(8 marks)
- c. Differentiate between procedural programming and object-oriented programming.
(8 marks)

(Total : 20 marks)

QUESTION 2

- a. Explain **FIVE (5)** important features of the Haskell programming language that distinguish it from imperative languages.
(10 marks)
- b. Write a complete Haskell program that performs the following tasks:
- Defines a function named `absoluteValue`.
 - The function accepts one integer parameter.
 - If the value is negative, the function returns its positive equivalent.
 - If the value is zero or positive, the function returns the value unchanged.
 - Display the result in the main program.

(10 marks)

(Total : 20 marks)

QUESTION 3

- a. Explain the following terms in Prolog. Give **ONE (1)** example for each term to support your explanation.
- i. Artificial Intelligence (3 marks)
 - ii. Predicate Logic (3 marks)
 - iii. Clause (3 marks)
- b. Given the following Prolog program:
- ```
vehicle(car).
vehicle(bike).
has_wheels(car).
has_wheels(bike).
can_move(X) :- vehicle(X), has_wheels(X).
?- can_move(car).
?- can_move(train).
```
- Indicate the results of the queries. (2 marks)
- c. A clinic records patients and appointments. Patients include amira, hafiz, and kumar. Appointments include "dentist" and "checkup". Amira and Hafiz booked dentist, while Kumar booked checkup. An appointment type is considered "busy" if it is booked by more than one patient.
- i. Express facts in Prolog to represent:  
The list of patients  
The list of appointment types  
The booking relationship between patients and appointment types (4.5 marks)
  - ii. Write a Prolog rule to define when an appointment type is busy. (1.5 marks)
  - iii. Write Prolog queries to find out who booked "dentist" and to check whether "checkup" is a busy appointment. (3 marks)

(Total : 20 marks)

## QUESTION 4

- a. Explain **FOUR (4)** reasons why Python is suitable for developing different types of applications due to its programming paradigm support. (8 marks)
- b. Discuss the differences between **primitive** and **non-primitive** data types in Python using appropriate examples. (4 marks)
- c. Explain the steps involved in creating and importing a user-defined module in Python. (2 marks)
- d. Write a Python program based on the following requirements:
- The Program ask the user to input an examination score.
  - If the score is greater than or equal to 70, display "Passed" if otherwise, display "Not Passed"
- (6 marks)

(Total : 20 marks)

## QUESTION 5

- a. Explain how **Event-Driven Architecture (EDA)** system responsiveness. (2 marks)
- b. Explain **THREE (3)** advantages of using Event-Driven Architecture in modern software systems. (6 marks)
- c. Compare the **Infrastructure as a Service (IaaS)**, **Platform as a Service (PaaS)** and **Software as a Service (SaaS)** in terms of user responsibility and level of control. Provide **ONE (1)** example for each cloud service model. (9 marks)
- d. Explain **TWO (2)** advantage of adopting microservices architecture in large-scale applications. (3 marks)

(Total : 20 marks)

(TOTAL :100 MARKS)

END OF QUESTION PAPER