Open University *of* Mauritius

BSc (Hons) DATA SCIENCE AND ARTIFICIAL INTELLIGENCE [OUbs035]

EXAMINATION FOR: November-December 2022

MODULE : Software Engineering Fundamentals [OUbs035122]

DATE : Tuesday 13 December 2022

DURATION : 2 Hours

INSTRUCTIONS TO CANDIDATES

1. The paper consists of **SIX (6) QUESTIONS**.
2. Answer **ANY FIVE (5) QUESTIONS**.
3. Always start a new question on a fresh page.
4. Total marks: **100**

This question paper contains 6 questions and 4 pages.

ANSWER ANY FIVE (5) QUESTIONS

QUESTION 1 [20 MARKS]

a) Software engineering principles use two important techniques to reduce problem complexity: **abstraction** and **decomposition**.

Differentiate between decomposition and abstraction.

(6 marks)

b) Software project management comprises of several activities. Describe **three (3)** activities involved in software project management

(6 marks)

c) Software Development Life Cycle is a set of steps used to create software applications. Compare and contrast between RAPID APPLICATION DEVELOPMENT (RAD) and V model by including their advantages and disadvantages.

(8 marks)

QUESTION 2 [20 MARKS]

a) There are several tools available for project management. Differentiate between PERT Chart and Critical Path Analysis.

(4 marks)

b) Software Testing is very useful, as it reduces the time and cost of rework. Explain the difference between Functional and Non-Functional Testing using examples.

(10 marks)

c) What do you understand by the term 'SOFTWARE REQUIREMENT SPECIFICATION'?

(6 marks)

QUESTION 3 [20 MARKS]

a) Design and draw a use case diagram for an Online Shopping System.

(8 marks)

b) Verification and validation (V&V) are the generic term for checking process which ensures that the software meets its requirements and that the requirements meet the needs of the customer.

Explain the difference between verification and validation

(6 marks)

c) Differentiate between cohesion and coupling.

(6 marks)

QUESTION 4 [20 MARKS]

a) State and explain the different types of Computer Networks that exist?

(8 marks)

b) What do you understand by RESTful API and what are its different method?

(6 marks)

c) Describe **three (3)** types of python loops.

(6 marks)

QUESTION 5 [20 MARKS]

a) State and explain the three 'C' in a User Story.

(6 marks)

b) Explain the different techniques that can be associated with deployment.

(6 marks)

c) Draw a state machine diagram for an ATM System.

(8 marks)

QUESTION 6 [20 MARKS]

a) What are the different ways to do Software Estimation?

(6 marks)

b) Differentiate between Python iterators and generators

(4 marks)

c) Write a python function that returns a Fibonacci sequence.

(6 marks)

d) Calculate Cyclomatic Complexity of below.

(4 marks)