Open University *of* Mauritius

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

EXAMINATION FOR: June - July 2022

MODULE : Software Engineering Fundamentals [OUbs035122]

DATE : Friday 08 July 2022

DURATION : 2 Hours

INSTRUCTIONS TO CANDIDATES

1. This question paper consists of **SECTION A** and **SECTION B**.
2. **Section A** is **COMPULSORY**.
3. Answer **ANY TWO (2) Questions** from **Section B**.
4. Always start a new question on a fresh page.
5. Total marks: **100**

This question paper contains 5 questions and 6 pages.

SECTION A

COMPULSORY

QUESTION 1 [25 MARKS]

a) Explain **three (3)** importance of Software Engineering.

(6 marks)

b) Differentiate between Frontend and Backend Engineers.

(4 marks)

c) What are the advantages of using the Incremental Model?

(4 marks)

d) Define what Functional Requirement is and give **one (1)** example of it.

(3 marks)

e) Differentiate between Regression Testing and Acceptance Testing.

(4 marks)

f) Differentiate between Security Testing and Usability Testing.

(4 marks)

QUESTION 2 [25 MARKS]

a) Write a Python program to check if the number entered by the user is Positive, Negative, or 0.

(7 marks)

b) Company Corn is specialised in developing a system for the hospital's needs. They have been appointed to develop a system to diagnose cancer. Corn has to select which SDLC Model to use. The system must be developed with documented customer and system requirements going in, traceable system and acceptance tests going out, all documents configuration managed, and all requirements proved, confirmed and auditable. Everything has to be confirmed and proved on the way out, with documents stored in a configuration management system as well as in physical form. Suggest and explain which is the best SDLC Model to use.

(5 marks)

c) Draw a Use-Case Diagram for a University, taking into account the following criteria:

- Professors indicate which courses they will teach online.
- A course catalog can be printed.
- Allow students to select four online courses for the upcoming semester.
- No course may have more than 10 students or less than 3 students.
- When the registration is complete, the system sends information to the billing system.
- Professors can obtain course rosters online.
- Students can add or drop classes online

(10 marks)

d) Explain in details what is Features Coverage.

(3 marks)

SECTION B

ANSWER <u>ANY TWO (2)</u> QUESTIONS

QUESTION 3 [25 MARKS]

a) Explain the Object-Oriented Principles.

(8 marks)

b) What are the benefits of Benefits of Code Coverage?

(6 marks)

c) Differentiate between Simple Network Management Protocol (SNMP) and Internet Control Message Protocol's (ICMP).

(4 marks)

d) Explain **two (2)** coding standards that exist.

(4 marks)

e) What is an API?

(3 marks)

QUESTION 4 [25 MARKS]

a) Differentiate between cohesion and coupling.

(4 marks)

b) What are the differences between Deployment and Maintenance?

(4 marks)

c) Using Pythonic Coding, write the following:

i. Declare a variable using white spaces around operators and assignments.

(2 marks)

ii. Declare a variable name of DateOfBirth with today's date.

(2 marks)

iii. A statement with the condition if 'n' is equal to 1 and 'p' is equal to 1 then return true, use case sensitivity and indentation.

(3 marks)

iv. Using one statement of code per line and indentations, use a variable YourDetails that will contain your student ID, full name, date of birth, and address.

(3 marks)

v. Comment this line of code 'print("Welcome")'.

(2 marks)

d) Calculate the cyclomatic complexity of the following code, using a diagram?

```
def score():
    if marks >= 40:
        result = 'Pass'
    else:
        result = ('Fail')
print(result)
```

(5 marks)

QUESTION 5 [25 MARKS]

a) State **five (5)** advantages of using Agile Models.

(5 marks)

b) Using an example, explain what is Multiple Assignment.

(4 marks)

c) Explain what is Recursion Function in Python.

(3 marks)

d) Explain how the Zip functionality works in Python.

(4 marks)

e) Explain **three (3)** benefits of Problem Partitioning?

(3 marks)

f) What are the **three (3)** main things that will be retrieved from the web server?

(6 marks)