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RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences
Second Year - Semester II Examination – February/ March 2019

COM 2308 – SOFTWARE ENGINEERING

Time: Three (03) hours

1. This paper contains **five (05)** questions on **four (04)** pages.
2. This examination accounts for 60% of the course assessment. The total maximum mark attainable is 100. The marks assigned for each question and section, thereof are indicated in brackets.
3. This is a closed book examination.
4. Mobile phones or any other communication devices are not permitted.
5. Clearly state the assumptions you make.
6. Answer **All** questions.

1. a. Briefly explain following software engineering objectives.
   - Maintainability
   - Reusability
   - Reliability
   - Portability

   (04 marks)

   b. Briefly Describe term **System Engineering**.

   (02 marks)

   c. Briefly Describe term **Software**.

   (02 marks)

   d. Assume that you are working for a software development company. You have to develop a Learning Management System for a university to handle student details, exam results, semester registrations, etc... Project duration is six (06) months.

   In order to develop the system, choose the best software development process model that you would use from the ones given bellow. Justify your decision on your selection or rejection.
   - Extreme programming
   - Waterfall model
   - Spiral model
   - Cowboy coding

   Assume that you and your team are well practiced in these methods.

   (12 marks)

2. a. Describe the importance of **Test cases** in Test Driven Development (TDD).

   (02 marks)

   b. Briefly explain the **four (04)** factors that you need to consider when selecting a programming language.

   (06 marks)

   c. Describe the importance of **coding styles** and **documenting guidelines**.

   (03 marks)

   d. Describe how you can use **Checkpointing** (Software fault tolerance approach) in the project described in Question **1. d** above.

   (03 marks)

   e. Describe how the following factors would affect the **Verification and Validation confidence**.
   - Software function
   - User expectations
   - Marketing environment.

   (06 marks)

3. a. Explain the **Verification and Validation** methods which are suitable to be used in the project described in Question **1. d.**

(04 marks)

b. Briefly describe the process of **Debugging**.

(02 marks)

c. Briefly describe advantage of **software inspections** over **testing**.

(03 marks)

d. Assume that you are working for a software development company. You have to develop an IoT based system. The embedded programming will be done using C and Assembly language. The project duration is **eight (08)** months.
Describe the types of **Verification and Validation** methods needs to be used for this project.

(04 marks)

e. What are the **four (04)** steps in the risk management process? Explain them briefly.

(04 marks)

f. Briefly describe **three (02)** reasons why project scheduling problems occur.

(03 marks)

4 a. Describe the maintenance cost reducing methods that you can use during the development of the project described in Question **3. d** above.

(05 marks)

b. Briefly describe why the maintenance cost increases with program age.

(02 marks)

d. Briefly describe the following terms in configurations management.

- Derivation history
- Version
- Variant
- Release

(06 marks)

e. Briefly describe the process known as **System Building**.

(03 marks)

f. Briefly explain the following **Software Pricing Factors**.

- Contractual terms
- Requirements volatility

(04 marks)

5. a. Briefly describe why it is difficult to measure the productivity of a software development process.

(02 marks)

b. Briefly describe **two (02)** software cost estimation techniques.

(03 marks)

c. Briefly describe the method known as **pair programming**.

(02 marks)

d. Briefly describe **three (03)** human factors in **UI** design.

(03 marks)

e. Briefly describe the following **UI** design principles.

- Minimal surprise
- User guidance

(04 marks)

f. Briefly describe **three (03)** ways in which users interact with a system (user interaction styles).

(03 marks)

g. Briefly describe what **Legacy system** is.

(03 marks)

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