UNIVERSITY OF RUHUNA
BACHELOR OF SCIENCE (GENERAL) DEGREE
LEVEL III (SEMESTER II) EXAMINATION – JANUARY 2018

COURSE UNIT : COM3212 - ADVANCED SOFTWARE ENGINEERING CONCEPTS
TIME : 2 Hours

*Answer only **four** Questions.*

1.

a. "Software engineering is a layered technology", briefly explain what is mean by layered technology in the above statement.

b. What is the most important difference between generic software product development and custom software development? Explain how this difference affects for users of generic software products?

c. Briefly explain four (04) essential attributes of good software.

d. Give two (02) appropriate software process models to design each of the following systems. Give reasons for your answers.

i. An insulin pump control system that collects data from a blood sugar sensor and calculates the amount of insulin required to be injected.

ii. Web based auction system for vehicle spare parts of well-known business organization.

2.

a. Explain the desired situations and the undesired situations to apply RAD model.

b.

i. Briefly explain the phases in spiral model.

ii. Why the spiral model is rarely used in software development.

c.

i. Give three (03) different forms of Software reusability.

ii. Briefly explain three (03) advantages of software reuse.

d. The software development company receives a project to develop software for the small scale business. The software development team summerises the project as follows.

The business organization is unable to give a complete set of requirements. They also expect to receive a simple working model of the software in short time period. Further, they agreed to provide a feedback for this working model periodically.

i. What is the most appropriate prototyping model for the above software development? Justify your answer.

ii. "Prototyping model is less appropriate for real-time systems engineering". Explain the above statement by giving reasons.

3.

a. Explain four (04) principals of agile software development.

b.

i. Explain the difference between plan-driven software development and agile software development with respect to their processes.

ii. Give two situations where agile methods are inappropriate.

c. A software company that designs critical systems for air crafts always attempts to prove the consistency and completeness of the requirements specification mathematically. They follow a specific process model together plan-driven approach for the above purpose.

i. What is the specific process model that matches the above case?

ii. Is the process model you suggested above in (i) popular among many software development teams? Explain your answer.

d.

i. "Rational Unified Process can be described with different perspectives". Explain the statement.

ii. Briefly describe the two phases of the Rational Unified Process in which the majority of the planning and designing activities are performed.

4.

a. Explain why it is important to make a distinction between developing the user requirements and developing system requirements in the requirements engineering process.

b. Propose three (03) suitable functional requirements for a university library system.

c. An automated mobile based taxi service provides a transport facility to its registered customers. A customer can make a request by giving the starting location and the destination of the required travel. The customer can view each travel option's waiting time and price. When one of the preferred options is selected, the system gives the driver's contact details and vehicle information. When the customer reaches the destination the system automatically charges the customer credit card.

   i. Give two product based non-functional requirements for the above system. Write suitable examples for each category using the above case study.

   ii. Give three examples of ambiguities or omissions of the above scenario.

   iii. What are the appropriate software testing types for above system after all the sub systems are integrated? Explain them briefly.

5.

a. The following observations were made by a team during the analysis for developing web based system.

   - The requirements are clear and can be defined completely. These requirements can be prioritized considering importance to the user.
   - The system can be implemented as phases according to the defined priorities.
   - The product must be put into the market use in short time.
   - Development team members are not very well skilled and trained.

   i. What is the best software process model you suggest to use for the development of the above system? Justify your answer.

   ii. State two (02) advantages and two (02) disadvantages of the model, you suggested in (i) above.

iii. Can you apply the model you given in (i) above to design a payroll software application for a manufacturing company? Justify your answer.

b.

i. Give two measures of modularity in software designing.

ii. Briefly describe two levels of each measure.

c. What is mean by stepwise refinement in software design? Give a suitable example to it.

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