VU.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: V**
Branch: Computer Science And Engineering **Duration: 3 hrs.**
Course Code: 20CS5PCSEG **Max Marks: 100**
Course: Software Engineering **Date: 27.09.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may suitably assumed.

UNIT - I

1	a)	Discuss the responsibilities that the software engineers should have towards profession and society. State ACM/IEEE code of Ethics and professional practice that software engineers should adhere to.	**6**
	b)	Analyze and classify the Non-functional requirements hierarchy diagram of an interactive system that allows employees of an organization to have private meetings with their clients while working remotely from home. Explain with relevant diagram.	**8**
	c)	Write plausible user requirement definition and system requirements specification for the following functions: i) The cash-dispensing function in a bank ATM ii)An unattended petrol (gas) pump system that includes credit card reader to deliver the amount of fuel required.	**6**

OR

2	a)	Explain the key challenges facing software engineering.	**4**
	b)	Giving reasons for your answer based on the type of system being developed, suggest the most appropriate generic software process model that might be used as a basis for managing the development of the following systems: i) A bank accounting system that replaces an existing system. ii) A virtual reality system to support software maintenance. iii) A system to control anti-lock braking in a bike iv) An interactive system that allows metro rail passengers to find train terminals installed in stations.	**8**
	c)	Consider the vaccination drive service where citizens of a country who are in the age group of 15 to 60 should be given vaccination to fight against the deadly virus. The registration process can be done online or directly get vaccinated at various health centers setup by the government. Capture the requirement specification with respect to the age group and doses to be given using structured natural language template.	**8**

UNIT - II

3 a) Eliciting and understanding stakeholder requirements is difficult for several reasons Justify. **5**

b) A software system is to be developed to manage the records of patients who enter a clinic for treatment. The records include records of all regular patient monitoring (Temperature, BP etc), treatments given, patients reactions and so on. After treatment the records of their stay are sent to patients doctor who maintains their complete medical record. **7**
Identify the principal viewpoints which might be taken into account in the specification of this system and organise these using a view point hierarchy diagram and explain.

c) Consider a Tour and Travel Management System. **8**
a. List three actors. Explain the relevance of each actor.
b. List four use cases at the comparable level of abstraction and prepare a use case diagram for Tour and Travel Management system. Summarize the purpose of each use case with a sentence.
c. Design the Sequence diagram corresponding to any one scenario.
d. Design the State machine model for booking scenario.

UNIT - III

4 a) Explain the Object Oriented Decomposition for an invoice processing system with a neat diagram. Discuss their advantages and disadvantages. **6**

b) i) Analyze the system and suggest an appropriate structural model for the following. Give reasons for your answers **8**

- A computer-controlled video conferencing system that allows video, audio and computer data to be visible to several participants at the same time.
- A robotic floor cleaner that is intended to clean relatively clear spaces such as corridors. The cleaner must be able to sense walls and other obstructions.

ii) Analyze the system and suggest an appropriate control model for the following. Give reasons for your answers

- A batch processing system that takes information about hours worked and pay rates and also prints salary slips, bank credit transfer information.
- A set of software tools that are produced by different vendors, but which must work together.

c) Identify possible objects in the following systems and develop an object-oriented design for them. You may make any reasonable assumptions about the system when deriving the design. **6**
i) Weather station system.
ii) Loan Management system.

UNIT - IV

5 a) Identify the type of risks that are likely to be encountered as a software is built. **4**

b) If an organization average productivity is 10 Function Point(FP) per month at the burdened labour rate of $12000 per month. Given an information domain value count of 420 and ∑(Fi) is 55. Calculate **8**

i) FP Estimate
ii) Cost per FP
iii) Total project cost
iv) Estimates effort in person-months

c) Design the Task network and Time line chart for a developing a software for Online Entrance Exam Management system assuming minimum of 8 tasks, 4 milestones and 5 tasks having dependencies and also show the critical path for your design. **8**

UNIT - V

6 a) Define the objective and strategies involved in Cleanroom software development approach with a neat diagram. **6**

b) Consider that an organization has 25 legacy systems. Analyze how the quality and the business value of each of these systems is assessed and compared with others by plotting it on a chart showing relative business value and system quality. Discuss what are the different clusters that could be formed and explain your answer. **8**

c) Using your knowledge of java, C++ or other programming language, derive a checklist of common errors (not syntax errors) that could not be detected by a compiler but that might be detected in a program inspection. **6**

OR

7 a) Differentiate between Black box and White box testing. **6**

b) Consider the "Binary Search routine" Write the specification of a search routine. Analyze the equivalence partitions for search routine with suitable test cases. Draw the corresponding flow graph for a binary search routine find the number of independent paths to be tested. **8**

c) Write minimum of 10 test cases to check the functionality of the shopping cart of an e-commerce website **6**

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