VIT-AP UNIVERSITY	Final Assessment Test – Summer Semester-2 - July 2024	
	Course code : CSE 1005	Duration: 3 Hours
	Course Title : Software Engineering	Max Marks: 100
	Course Mode : **CBL / PBL / RBL**	School: SCOPE
Date: 20-07-2024	Slot: C Set 2	Session: FN

Keeping mobile phone/smart watch, even in 'off' position is treated as exam malpractice

General Instructions if any:

1. **"*fx* series" - non Programmable calculator are permitted : YES**
2. **Reference tables permitted : NO (if Yes, Please specify:)**

Answer any TEN Questions, Each Question Carries 10 Marks (10×10=100 Marks)

1. An online grocery home delivery service provider is planning to launch an application to bring revolution in the retail market, identify various framework activities and umbrella activities involved in software process development of the project given for above scenario? **(10 M)**
2. Discuss which process model is suitable for above scenario and justify your answer? **(10 M)**
3. Describe the requirements with your assumptions and model them with (i) use-case diagram (ii) sequence diagram **(10 M)**
4. Discuss about various design quality attributes to be consider for a successful software development.? **(10 M)**
5. Explain about strategic approach for software testing process. **(10 M)**
6. Explain about various black box techniques with an example of each for a software testing. **(10 M)**
7. A system has 12 external inputs, 26 external outputs, fields 32 different external queries, manages 5 internal logical files, and interfaces with 7 different legacy systems (7 EIFs). All of these data are of average complexity and the overall system value adjustment factor is 3. Compute FP for the system. **(10 M)**
8. A major information system has 1240 modules. There are 90 modules that perform control and coordination functions and 390 modules whose function depends on prior processing. The system processes approximately 310 data objects that each have an average of three attributes. There are 150 unique database items and 80 different database segments. Finally, 800 modules have single entry and exit points. Compute the DSQI for this system. **(10 M)**

9. Do a functional decomposition of the robot software you described below table. Estimate the size of each function in LOC. Assuming that your organization produces 600 LOC/pm with a burdened labour rate of $5000 per person-month, estimate the effort and cost required to build the software using the LOC-based estimation. **(10 M)**

Function	Estimated LOC
User interface and control facilities (UICF)	2,300
Two-dimensional geometric analysis (2DGA)	5,300
Three-dimensional geometric analysis (3DGA)	6,800
Database management (DBM)	3,350
Computer graphics display facilities (CGDF)	4,950
Peripheral control function (PCF)	2,100
Design analysis modules (DAM)	8,400
Estimated lines of code	*33,200*

10. Use the COCOMO II model to estimate the effort required to build software for a simple ATM that produces 40 screens, 100 reports, and will require approximately 82 software components. Assume average complexity and average developer/environment maturity. Use the application composition model with object points. Use below table for complexity weighting for object types. **(10 M)**

Object type	Complexity weight		
	Simple	Medium	Difficult
Screen	1	2	3
Report	2	5	8
3GL component			10

11. Differentiate between CMM and CMMI for software quality management. **(10 M)**
12. Discuss software re-engineering, explain in detail about various steps involved in re-engineering process. **(10 M)**

VIT-AP UNIVERSITY	Final Assessment Test – Long Summer (2023-24) - July 2024	
	Maximum Marks: 100	Duration: 3 Hours
Course Code: **CSE1005**	Course Title: **Software Engineering**	
Set No: 1	Exam Type : **Closed Book**	School: SCOPE
Date: 21-07-2024	Slot: C D	Session: AN
Keeping mobile phone/smart watch, even in 'off' position is treated as exam malpractice		
General Instructions if any: 1. **"*fx* series" - non Programmable calculator are permitted: NO** 2. **Reference tables permitted : NO (if Yes, Please specify:)**		

PART – A: Answer any TEN Questions, Each Question Carries 10 Marks (10×10=100 Marks)

1. **Scenario:** Imagine you are part of a consulting firm that specializes in helping startups optimize their software development processes. A new client has approached your firm with a project idea for a sophisticated, cloud-based healthcare management system intended for small to medium-sized clinics. The client has a basic understanding of software but lacks technical depth, particularly in structuring and managing large-scale software development projects.

   Question: Given this scenario, can you explain why it is crucial for this startup to apply software engineering principles to their project development? Discuss how software engineering can help in building a successful healthcare management system, focusing on aspects such as communication, planning, modeling, construction, testing, deployment, and maintenance. **(10 M)**

2. **Scenario:** You oversee a software team at a company that wants to update its old customer management system. The new system needs to work well with other tools the company uses and must be easy to change so it can meet different needs as the company grows.

   Question: Given that the new system needs to be flexible and always improving, which software development model should you use for this project? Explain why this model is good for making changes based on feedback and adjusting to new requirements as you work. **(10 M)**

3. **Scenario:** Imagine you are a software architect at a healthcare technology company tasked with developing a new telemedicine platform. This platform must securely handle sensitive patient data, integrate with existing electronic health records (EHR) systems, and provide a seamless user experience for both patients and healthcare providers across various devices. The platform also needs to comply with stringent health regulations and data protection laws.

   Question: Given the complexity and the critical requirements of the telemedicine platform, how important is the Software Requirement Specification (SRS) document in the development process? Discuss how the SRS could impact the project's success, considering the need for regulatory compliance, interoperability, and user satisfaction. **(10 M)**

4. **Scenario:** You are a systems analyst at a logistics company that is planning to revamp its warehouse management system (WMS). The new system needs to track inventory, manage orders, and optimize the routing of goods within multiple warehouses. Your task is to design a

system that not only improves operational efficiency but also provides real-time data visualization and analytics to help decision-makers optimize supply chain operations.

Question: How would utilizing Unified Modeling Language (UML) diagrams benefit the design process of your new warehouse management system? Discuss the role of UML in clarifying system requirements, enhancing communication among stakeholders, and aiding in the architectural design of complex systems like a WMS. **(10 M)**

5. **Scenario:** You are part of a development team at a gaming company working on a highly anticipated multiplayer online game. The game features complex interactions between players and an advanced AI-driven environment. Before release, the game needs to be tested extensively to ensure it performs well under various network conditions and with different hardware setups to prevent crashes or lags during gameplay.

   Question: Considering the complex nature of multiplayer interactions and varying player hardware, which software testing strategies would be most effective to ensure the game's performance and stability? Discuss the benefits of using testing in this context. **(10 M)**

6. **Scenario:** You are a quality assurance manager at a fintech company developing a new mobile banking application. This app must securely handle transactions, personal data, and provide a reliable user interface that adapts to various devices and operating systems. It is crucial that the app meets all security standards and provides a consistent user experience.

   Question: How should your team approach testing for the new mobile banking application to ensure it is secure and user-friendly across different devices? Explain the roles of white box and black box testing in verifying both the functional and non-functional requirements of the app. **(10 M)**

7. **Scenario:** You are an IT project manager at a large retail corporation planning to implement a new point-of-sale (POS) system across multiple store locations. The system needs to integrate seamlessly with existing inventory and employee management systems and must be scalable to handle peak transaction periods like holiday sales. The project requires careful planning and budgeting to ensure it meets the needs of the business without excessive costs.

   Question: Given the complexity and the need for integration with existing systems, how can Function Point Analysis (FPA) be utilized in the planning and budgeting phases of this new POS system project? Discuss how FPA could assist in estimating the time, cost, and resources required for successful implementation and ongoing maintenance of the system. **(10 M)**

8. **Problem Scenario:** You are a software project manager at an educational software company tasked with developing an interactive learning platform for high school students. This platform will include multimedia content, quizzes, student progress tracking, and teacher dashboards for monitoring and feedback. The project is estimated to have around 85,000 lines of code (85 KLOC).

   Challenge: Given the scope of the project and the requirement for robust functionality, your challenge is to estimate the effort, time, and cost needed to complete this project using the Basic COCOMO model. Your company operates primarily with a semi-detached development environment, which is moderately complex and generally involves a team with mixed experiences.

   Question: Using the parameters of the Basic COCOMO model appropriate for a semi-detached model calculate:

a. The effort required in person-months.
b. The development time in months.
c. The average number of people required for the project.

How would you use these estimates to plan and allocate resources effectively? Consider how adjustments might be made if the project's actual progress deviates from these initial estimates. **(10 M)**

9. **Scenario:** You are leading a project management team at an aerospace engineering firm tasked with developing a new satellite communication system. The project involves multiple complex components including designing the satellite's payload, developing ground control software, and coordinating with international space agencies for launch arrangements. Given the complexity and interdependencies of these tasks, the project timeline and resource allocation need to be meticulously planned.

Question: Given the intricacies and dependencies involved in the satellite communication system project, how would you utilize the Program Evaluation and Review Technique (PERT) to manage the project's schedule and risks? Discuss how PERT would help in identifying critical tasks, estimating the shortest and longest possible completion times for the project, and how this methodology could aid in resource allocation and risk management. **(10 M)**

10. Why project Scheduling is important? Explain with relative examples **(10 M)**

11. Explain about Capability Maturity Model? **(10 M)**

12. What is the importance of software maintenance and reuse **(10 M)**

QP MAPPING

Q. No.	E/A/T	Module Number	Marks	BL	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped
Q1	E	1	10	1	1	1, 2, 3, 4, 5	1, 2	1
Q2	E	1	10	1	2	1, 2, 3, 4, 5, 6, 7, 8	1, 2	1, 2
Q3	A	2	10	2	4	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	1, 2,4	1, 2,3
Q4	A	2	10	2	1	1, 2, 3, 4, 5	1, 2	1
Q5	T	3	10	2	5	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	1, 2,4	1, 2, 3
Q6	A	3	10	3	5	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	1, 2,4	1, 2, 3
Q7	A	4	10	3	4	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	1, 2,4	1, 2, 3
Q8	A	4	10	3	4	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	1, 2,4	1, 2, 3
Q9	T	5	10	4	2	1, 2, 3, 4, 5, 6, 7, 8	1, 2	1, 2
Q10	A	5	10	4	2	1, 2, 3, 4, 5, 6, 7, 8	1, 2	1, 2
Q11	T	6	10	3	3	1, 2, 3, 4, 5, 6, 7, 8	1, 2,4	1, 2, 3
Q12	T	6	10	4	3	1, 2, 3, 4, 5, 6, 7, 8	1, 2,4	1, 2, 3