



- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

Answer ALL Questions
(10 X 10 = 100 Marks)

1. A hospital wants to develop a patient management system, but is unsure about how different departments will interact with the software. Identify which software process model would be applicable in this application and further enlist the advantages and challenges of the chosen model.
2. A startup is launching a ride-sharing app where users can book rides, track drivers, and make payments within the app. Name any five functional and non-functional requirements for this app. If users report that the app crashes frequently on older smartphones, which type of requirement is not being met and how should the development team respond?
3. A company is developing a new inventory management system, but is unsure about the features needed. Discuss the requirement engineering process stages in order to handle conflicting requirements, prioritizing requirements, development of SRS, eliminate chances of missing requirements and handle changes of requirements.
4. A leading bank, SecureBank, wants to develop a new Banking Management System (BMS) to improve customer experience, enhance security, and automate banking operations. The system will support online and mobile banking, ATM transactions, and in-branch services. The software should be secure and efficient, user-friendly, have automated fraud detection and real-time transaction monitoring. The expected primary functionalities are: User authentication, Account Management, Funds Transfer, Bill Payments, ATM Card Management, Loan and Credit Service, Customer Support Chat and Fraud Detection Alert. Considering the above scenario, discuss the application of MVC architecture with neat sketch.

5. Consider the following program. Draw the control flow graph and calculate cyclomatic complexity using White Box Testing Technique.

```
#include <stdio.h>

void checkNumber(int num) {
    if (num > 0) {
        printf("Positive number\n");
    } else if (num < 0) {
        printf("Negative number\n");
    } else {
        printf("Zero\n");
    }

    for (int i = 0; i < 5; i++) {
        if (num % 2 == 0) {
            printf("Even number\n");
        } else {
            printf("Odd number\n");
        }
    }

    int x = num;
    while (x > 0) {
        x--;
    }
}

int main() {
    checkNumber(10);
    return 0;
}
```

6. When should a company consider reengineering its software instead of building a new system? Discuss how software re-engineering differs from software maintenance highlighting its stages with suitable example.

7. A software development team is working on a project with the following tasks. Draw the Activity of Node and **network diagram** for this project. Calculate ES, EF, LS, LF, Float and Identify the **Critical Activities and Critical Path**.

Task	Description	Duration (Days)	Dependencies
A	Requirements Gathering	5	None
B	System Design	8	A
C	Database Setup	4	A
D	UI Development	10	B, C
E	Backend Development	12	B
F	Integration Testing	7	D, E
G	Deployment	3	F

8. Discuss safety critical system and how it differs from general software system. Also discuss the key challenges of developing safety-critical software.

- 9.a) Consider the scenario in Question. No. 4 and draw a use case diagram.

OR

- 9.b) Consider the scenario in Question. No.4 and draw a class diagram with *all possible features*.

- 10.a) An e-commerce platform consists of multiple modules: user authentication, product catalog, shopping cart, and payment gateway. Discuss the different levels of testing to be performed for this platform.

OR

- 10.b) An e-commerce platform is being developed using Test-Driven Development (TDD). The system includes the following modules - User Authentication, Product Catalog, Shopping Cart and Payment Gateway. As a software developer, discuss how Test-Driven Development (TDD) can be implemented for this above mentioned scenario.

⇔⇔⇔ B/E/TY ⇔⇔⇔