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QUESTION PAPER

Name of the Examination: CAT (FALL 2022-2023)

Course Code: CSE1005

Course Title: Software Engineering

Slot: C2+TC2

Date of Exam: 02-11-2022

Duration: 90 min

Total Marks: 50

Q1. Need of the Online bus Reservation System is that the manual system of bus ticket reservation takes more time and the number of reservations per day is limited. To increase the efficiency of the process, we go for online bus ticket reservation system. This system is built for user to directly access the system online to book bus tickets. The user can book, print, delete bus tickets without the help of a clerk. The administrator has control over the adding buses available for booking and has control over deleting buses that are not necessary. The administrator and user can both enter the system using their respective login details.

    i)   Discuss and Apply framework activities of Software Engineering in the above scenario.

    ii)   Discuss and Apply Umbrella activities in the above scenario. **(10M)**

Q2. "Particularly useful when staffing is unavailable for a complete implementation by the business deadline". The above narration is well suited for a process model for software development.

    i)   Identify the model and explain with a neat sketch.

    ii)   Give an example, that clearly demonstrates the working principle of the model. **(10M)**

Q3. A software company decides to develop a e-commerce web site, which allow people buy and sell their products. This company works as negotiator between buyers and sellers, takes commission for this service. The software company aims to develop this website user friendly.

    i)   Analyze the requirements for the above case study using Activity diagram

    ii)   Illustrate the requirement model using class diagram. **(10M)**

Q4. i) Explain in detail about the steps involved in basis path testing

ii) Perform the same in the below given pseudocode. **(10M)**

```
IF A=50
THEN IF B>C
THEN A=B
ELSE A=C
ENDIF
ENDIF
PRINT A
```

Q5. "The testing technique that designed to answer the questions like, how is functional validity tested? How are system behavior and performance tested?". The above narration is well suited for a software testing technique.

    i)   Identify the technique and explain with a neat sketch.

    ii)   Select any two approaches and give details that clearly supports the above testing technique. **(10M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1	1	1	3	1	10
Q2	1	1	1	3	1	10
Q3	2	2	4,5	3	1	10
Q4	3	3	4,5	3	1	10
Q5	3	3	4,5	3	1	10

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QUESTION PAPER

Name of the Examination: CAT (FALL 2022-2023)

Course Code: CSE1005

Slot: E1/TE1

Duration: 90 min

Course Title: Software Engineering

Date of Exam: 04.11.2022

Total Marks: 50

Instructions:

1. Use appropriate notation wherever necessary.
2. Any assumptions made should be clearly stated.

Q1. Scenario 1:

A library lends books and magazines to members, who are registered in the system. Also it handles the purchase of new titles for the library. Popular titles are bought in multiple copies. Old books and magazines are removed when they are out of date or in poor condition. A member can reserve a book or magazine that is not currently available in the library, so that when it's returned or purchased by the library, that person is notified. The library can easily create, update, and delete information about titles, members, loans, and reservations in the system. For the given **scenario 1** analyze and Identify the functional and its non- Functional requirements for preparing SRS documentation.

(10M)

Q2. Krishna and Gokul are friends. They wish to start a new restaurant, and they plan to provide online delivery. They need to develop the software for their restaurant, and their requirements are fixed and clear. They are approaching you to develop new software. As you are the software team head. Based on their requirements, which SDLC model is suitable to develop? Justify it with neat diagrams, merits, and demerits.

(10M)

Q3. Analyze and identify the actors involved in above **scenario 1**, and draw use case model with appropriate notation.

(10M)

Q4. Derive a flow graph for the given pseudo code and apply white box testing to develop the test cases that will guarantee that all statements in the pseudo-code have been tested. Execute the cases and show your results.

```
int a, b, c;
input a,b;
if (a > b)
{c = 23;}
else
{c = 25;}
while (b < c) {
```

```
        b = b + 1;
    }                                                                    (10M)
        write("answer = ",b);
```

Q5. The following password field accepts a minimum of 8 characters and a maximum of 12 characters. Choose an appropriate black box testing technique and write test cases for the same.

Enter Password: _____   Submit

(10M)

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1	1	1,2	1	1	10
Q2	1	1	1,3	2	1	10
Q3	2	2	3	2	1	10
Q4	3	3	4	3	1	10
Q5	3	3	4	3	1	10

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QUESTION PAPER

Name of the Examination: CAT (FALL 2022-2023)

Course Code: CSE1005

Slot: E2+TE2

Duration: 90 min

Course Title: Software Engineering

Date of Exam:

Total Marks: 50

Instructions:

1. Provide appropriate scenarios wherever necessary.
2. If explicit Scenarios provided in the questions, sane should be addressed.

Q1. A personal assistant application is to be developed for deployment in web as well as mobile platforms. The components that are to be provided includes Calendar, Notes, in-built calculator, alerts, contact book etc. With proper justification provide a suitable process model that could suffice the stated requirements. **(10M)**

Q2. Prepare an SRS document for an online application used by "HealthServ diagnostics Laboratory", where the appointments are fixed and payment process is done online. The patients can visit the lab during the fixed appointments and the reports are shared through drives online. As data movement is over public network security is a primary concern. **(10M)**

Q3. Draw use case, class and sequence diagram for an online Job Portal that includes the basic interactions of the candidates and the hiring firms. The basic interaction may include registering the profile and applying for Jobs, from the end of the candidates, viewing downloading and intimating the Interview call of candidates from the end of firms. **(10M)**

Q4. Consider a Pizza Ordering App that could allow only maximum 10 pizzas to be order through one order. The input includes the pizza item code and the quantity. Illustrate how to apply boundary value and equivalence partitioning techniques and generate test cases for the App.

(10M)

Q5. Illustrate how to calulate the cyclomatic complexity of the following Java Function using any two formulae and provide the set of test cases required to perform basis path testing.

```java
public void Calc( int a, int b,int c)
{
    if (a > b)
        {c = 23;}
    else
        {c = 25;}
    while (b < c)
        {b = b + 1;}
    System.out.println("b value = " + b);
}
```

(10M)

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1	1	1,2,3,9,10	1,2,3	1	10
Q2	2	2	1,2,3,4,5,9,10	1,2,3	1,2	10
Q3	2	2	1,2,3,4,5,9,10	1,2,3	1,2	10
Q4	3	3	1,2,4,5,9,10	1,2,3	1	10
Q5	3	3	1,2,4,5,9,10	1,2,3	1	10

Name of the Examination: CAT – 2 (Winter 2021-2022)

Course ID: AP2021225000164

Course Code: CSE1005   **Course Title:** SE

Slot: B1+TB1   **Date of Exam:**

Duration: 90 min   **Total Marks:** 50

Instructions:

1. Assume data wherever necessary.
2. Any assumptions made should be clearly stated.

Q1. In the early 2021, Citi Bank reported that it has mistakenly transferred $600 million to Revlon Inc.'s lenders. Being a renowned world class bank, it brought bad name to it thanks to the shoddy digital system. Wipro was in limelight since it had bought the technology service in 2008. What did go wrong? Assuming your experience in digital banking, elaborate about testing strategy to weed out such unwanted situation. **(10M)**

Q2. Write a programme in a language of your own choice to display all the prime numbers between 1 and 1000. Draw the control flow graph for the same. Find out the cyclomatic complexity from the CFG and show the number of independent paths. **(10M)**

Q3. Give at least three examples in which black-box testing might give the impression that "everything's OK," while white-box tests might uncover an error. **(10M)**

Q4. You are required to develop an application called "BNPL" (Buy Now Pay Later). Assuming your own SRS, develop a function-based metrics for evaluating the requirements. **(10M)**

Q5. Infosys has developed a very successful banking product called "Finacle". The intention of the product is to automate the banking system with very minimal human intervention. Team A detected 300 errors using function point technique and Team B detected 200 errors using kLoC method. What measures are to be taken prior to the release of the software? **(10M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	4	3	2	3	2	10
Q2	4	2	3	2	2	10
Q3	4	2	2	3	3	10
Q4	3	3	4	4	3	10
Q5	3	3	4	3	2	10

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QUESTION PAPER

Name of the Examination: CAT – 2 (Winter 2021-2022)

Course ID: AP2021225000165

Course Code: CSE1005   **Course Title:** SE

Slot: C2+TC2   **Date of Exam:**

Duration: 90 min   **Total Marks:** 50

Instructions:

1. Assume data wherever necessary.
2. Any assumptions made should be clearly stated.

Q1. In the year 2018, Punjab National Bank reported that it has been defrauded of ₹11,356.84 crore through fraudulent letters. Being a renowned national bank, it brought bad name to it thanks to the shoddy digital system. Assuming your experience in digital banking, elaborate about testing strategy to weed out such unwanted situation. **(10M)**

Q2. Write a programme in a language of your own choice to display all the Armstrong numbers between 1 and 1000. Draw the control flow graph for the same. Find out the cyclomatic complexity from the CFG and show the number of independent paths. **(10M)**

Q3. Give at least three examples in which white-box testing might give the impression that "everything's OK," while black-box tests might uncover an error. **(10M)**

Q4. You are required to develop an application called "BNPL" (Buy Now Pay Later). Assuming your own SRS, develop a quality measuring metrics for software quality assurance. **(10M)**

Q5. Infosys has invited critism for developing a glitchy software for income tax payment. The intention of the product is to automate the tax payment system with very minimal paper work. Team A detected 350 errors using function point technique and Team B detected 200 errors using kLoC method. What measures are to be taken prior to the release of the software? **(10M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1	1	1	2	1	10
Q2	1	1	1	2	1	10
Q3	1	1	1	2	1	10
Q4	2	2	4	-	1	10
Q5	2	2	4	-	1	10

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QUESTION PAPER

Name of the Examination: CAT – 2 (Winter 2021-2022)

Course Code: CSE1005   **Course Title: Software Engineering**

Class Id : AP2021225000158   **Slot: B1+TB1**

Total Marks: 50   **Date of Exam: 19/4/22**

Duration: 90 min

1. Assume that an organization is currently developing with an application "Billing Management System". Can you narrate who is responsible for "Are we building a right product" testing activity for this application and also list the set of tasks involved.   (10 Marks)

2. Let us consider that the University Examination system is under debugging Process. Specify how the symptoms, the suspected and identified cases will be resolved for the application specified. (10 Marks)

3. Develop a testing plan that emphasizes "rapid cycle testing" for the application "Course Registration" you are asked to work on.   (10 Marks)

4. Analyse the Safe Home software architecture for the purpose of evaluating architectural components with respect to the ability to make Safe Home more extensible from the viewpoint of the software engineers performing the work in the context of product enhancement over the next three years. Formulate Goal, Question and Metric for the application specified. (10 Marks)

5. Compute the function point value for a project with the following information domain characteristics

   Number of User Inputs: 54   (10 Marks)
   Number of User Outputs: 42
   Number of User Inquiries: 22
   Number of files: 7
   Number of External Interfaces: 3

   Assume that all Value Adjustment Factors takes average value.

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	3	3	1,2,4,5,9,10	-	1	10
Q2	3	3	1,2,4,5,9,10	-	1	10
Q3	3	3	1,2,4,5,9,10	-	1	10
Q4	4	4	4,9,10,11	-	1	10
Q5	4	4	4,9,10,11	-	1	10

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QUESTION PAPER

Name of the Examination: CAT – 2 (Winter 2021-2022)

Course Code: CSE1005

Class Id: AP2021225000159

Total Marks: 50

Duration: 90 min

Course Title: Software Engineering

Slot: C2+TC2

Date of Exam: 20/4/22

1. Who should perform the Validation Test- the software developer or the software user? Justify the Answer with the various tasks by taking Vehicle Booking as On-going Project. (10 Marks)

2. Assume that you are in the testing process of the E-Shopping Application. Specify with a framework how will you develop a continuous improvement approach for the testing process. (10 Marks)

3. Consider the Online Voting systems in under development. Identify some testability features will support for easy Program Testing for the application said. (10 Marks)

4. 4. Assume that you are given a role of quality manager in the development of Safe Home Systems applications. How will justify the design structure quality index for the application specified.

(10 Marks)

5. Compute the function point value for a project with the following information domain characteristics

Number of User Inputs: 44
Number of User Outputs: 32
Number of User Inquiries: 26
Number of files: 5
Number of External Interfaces: 6
Assume that all Value Adjustment Factors takes complex value. (10 Marks)

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	3	3	1,2,4,5,9,10	-	1	10
Q2	3	3	1,2,4,5,9,10	-	1	10
Q3	3	3	1,2,4,5,9,10	-	1	10
Q4	4	4	4,9,10,11	-	1	10
Q5	4	4	4,9,10,11	-	1	10

QUESTION PAPER

Name of the Examination: CAT – 2 (Winter 2021-2022)

Class ID: AP2021225000161

Course Code: CSE1005 **Course Title:** Software Engineering

Slot: B1+TB1 **Date of Exam:** 19.04.2022
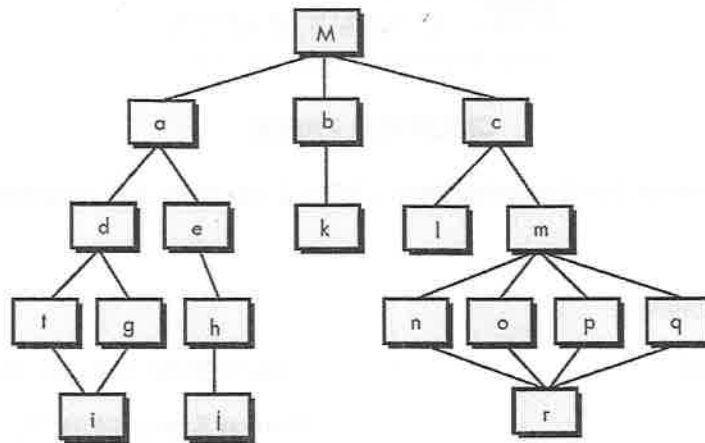
Duration: 90 min **Total Marks:** 50

Instructions:

➢ Assume data wherever necessary.

➢ Any assumptions made should be clearly stated.

➢ Answer all questions.

➢ No clarification during the examination; answer the questions as per your best understanding (carry marks).

Q1. **a)** "Alpha-Testing can be considered as a supplement of Beta-Testing" – Comment on this statement with proper justification. **(6M)**

b) Is it possible to conduct Beta-Testing at the developers' site? Justify your answer. **(4M)**

Q2. **a)** "Software testing activities can be considered as destructive and at the same time constructive activities" – do you agree with this statement? Why? **(5M)**

b) "To deliver a good quality software, testing should explicitly be done by developers" – comment on this sentence with justification. **(5M)**

Q3. Suppose you are trying to build an app (smartphone application) to calculate income tax. For the simplicity, assume that income tax is calculated based on the following rules:

I. If the age of an employee is less than 40, then tax payable is as follows:
   a. If annual income<300000, no tax.
   b. If annual income 300001-500000, tax is 10% of total income.
   c. If annual income is more than 500000, tax is 20% of total income.
II. If the age of an employee is 40 or above, they will have 5% deduction of tax.
III. A woman employee is required to pay 5% less than men employee.

a) Draw the flow diagram for the tax calculation module of your app.
b) Construct the control-flow graph for it.
c) Compute the cyclomatic complexity based on McCabe's model.
d) Conclude on the hardness of the program based on this calculation, with a proper justification.
(10M)

Q4. Consider the following diagram as a design model of a software module. Using Fenton's architectural design metrics, compute the module's size, depth, width, and arch to node ratio. **(10M)**

Q5. "A software engineer collects measures and develops metrics to obtain indicators" – Explain with justification and suitable example(s). **(10M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	3	3	1,2,4,5,9,10	3	1	10
Q2	3	3	1,2,4,5,9,10	3	1	10
Q3	3	3	1,2,4,5,9,10	3	1	10
Q4	4	4	2,3,4,8,9,10,11	4	1	10
Q5	4	4	2,3,4,8,9,10,11	4	1	10

QUESTION PAPER

Name of the Examination: CAT – 2 (Winter 2021-2022)

Course Code: CSE1005

Course Title: Software Engineering

Slot: B2+TB2 Slot

Date of Exam: 19.04.2022

Duration: 90 min

Total Marks: 50

Class ID: AP2021225000163

Q1.
```
sum(int a, int b)
int result =a+b;
if(result>0)
print("red");
else if (result<o)
print("blue);
```
Draw the flow graph for above Pseudocode and Find out the cyclomatic complexity from flow graph and show the number of independent paths

(10M)

Q2. Calculate the Function Point (FP) value for the Railway management System; this system has 20 external inputs, 40 external outputs, 9 external inquiries, 7 internal logical files, and 5 external interface files. Calculate the FP value for a simple case and complex case. Consider is $\Sigma F i = 40$ for both the cases. **(10M)**

Q3. A person defines her username according to several rules. The rules are:
a. The username must have at least six characters.
b. The username must contain at least one numerical character (0, 1, . . ., 9).
c. The username must contain at least one capital letter.
Assume that each rule defines a separate equivalence partitioning on the set of all strings. Each rule defines one valid and one invalid equivalence class. Each test case can cover only one invalid equivalence class. Find, set of input values is the smallest set that achieves the equivalence partitioning coverage? **(10M)**

Q4. Generate orthogonal array matrix for the following data to perform orthogonal array testing and list out its disadvantage.

Age Field	Qualification	Mother Tongue Field	Gender Field
Less than 18	High School	Hindi	Male
More than 18	Graduation	Tamil	Female
More than 65	Post Graduation	Telugu	Transgender

(10M)

Q5. Calculate the design structure quality index (DSQI) value for online booking system using Object oriented design. Consider the following values to compute DSQI metrics.

o Number of modules whose correct function depends on the source of data input 133
o Number of modules whose correct function depends on prior processing is 116.
o Total numbers of unique database items are 156.

- Number of modules with a single entry and exit is 356
- Number of database segments are 49
- Number of database items are 227
- Total number of modules defined in the program architecture is 403.   **(10M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	3	CO3	PO1, PO2	-	1	10
Q2	4	CO4	PO1	-	1	10
Q3	3	CO3	PO1	-	1	10
Q4	4	CO4	PO4	-	1	10
Q5	4	CO4	PO4	-	1	10

QUESTION PAPER

Name of the Examination: CAT – 2 (Winter 2021-2022)

Course Code: CSE1005

Slot: B1 slot

Duration: 90 min

Class Id: AP2021225000166

Course Title: SOFTWARE ENGINEERING

Date of Exam: 19.04.2022

Total Marks: 50

1. Discuss about the various behavioural testing techniques and derive the various test-cases for the following scenario:

   Let us consider a simple shopping software which having features as follows.
   Shop for $1500 and get 5% discount
   Shop for $2500 and get 7% discount
   Shop for $3500 and above and get 10% discount   (10M)

2. Write pseudo code that reads three integer values. The three values are interpreted as representing the lengths of the sides of a triangle. The pseudo code prints a message that states whether the triangle is scalene, isosceles, or equilateral. Develop a flow graph for the above code and Find the Independent Paths, Calculate the Cyclometric Complexity.   (10M)

3. Compute the function point value for a project with the following information domain characteristics:
   Number of user inputs: 32
   Number of user outputs: 60
   Number of user inquiries: 24
   Number of files: 8
   Number of external interfaces: 2
   Assume that all complexity adjustment values are average and weighting factors are high.   (10M)

4. Answer the following   (5*2=10M)
   A. A software increment is delivered to the end-users by a software team. The users uncover 8 defects during the first month of the use. Prior to delivery, the software team found 242 errors during formal technical reviews and all testing tasks. Compute the overall Defect Removal Efficiency (DRE) for the project?
   B. A class X has 12 operations. Cyclomatic complexity has been computed for all operations in the OO system, and the average value of module complexity is 4. For class X, the complexity for operations 1 to 12 is 5, 4, 3, 3, 6, 8, 2, 2, 5, 5, 4, 4, respectively. Compute the weighted methods per class.

5. Explain the Significance of Software Maturity Index (SMI) in the software maintenance A legacy software system has 940 modules. The latest release requires that 90 of these modules be changed. In addition, 40 new modules were added, and 12 old modules were removed. Compute the software maturity index for the system. (10M)

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PSO Mapped	Marks
Q1	3	CO3	PO1 PO2 PO4 PO5 PO9 PO10	PSO1	10
Q2	3	CO3	PO1 PO2 PO4 PO5 PO9 PO10	PSO1	10
Q3	4	CO4	PO4 PO9 PO10 PO11	PSO1	10
Q4	4	CO4	PO4 PO9 PO10 PO11	PSO1	10
Q5	4	CO4	PO4 PO9 PO10 PO11	PSO1	10

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QUESTION PAPER

Name of the Examination: CAT – 2 (Winter 2021-2022)

Course Code: CSE1005

Slot: B1+TB1

Duration: 90 min

Class ID: AP2021225000531

Course Title: Software Engineering

Date of Exam: 19-04-2022

Total Marks: 50

Instructions:

1. Assume data wherever necessary.
2. Any assumptions made should be clearly stated.

Q1. "Specifically helpful when software company needs to test each individual module of a software during the software development life cycle". The above narrative is ideal for software testing.

    i) Identify the testing strategy and explain its procedure with a neat diagram.
    ii) Explain the working principle with a real-time example considering test cases. **(10M)**

Q2. "A software company has signed a contract with business personnel to develop software for its business needs. The business personnel has asked the company to develop fault or error-free software. The company manager has asked its developers and testing group to test the software thoroughly. During the software development process, some errors have occurred due to some faulty logic within the software component. The company manager has directed the testing group to find the category of error associated with the faulty logic. In such a scenario, which subcategory of testing strategy will be best suited?

    i) Describe the chosen testing strategy with a real-time example.
    ii) List out a different mode of faults associated with the chosen testing strategy. **(10M)**

Q3. The testing group of a software company has been asked by the manager to test the independent paths, flow graph notation and create graph matrices of a given software module of code.

```
Statement-1
If (Expression-1)
    { Statement-2 }
Else
    { Statement-3 }
 Satement-4
do
    { Statement-5 }
While (Expression-2)
Statement-6
    Go to Statement-1 from Statement-6
```

    i) Identify the testing strategy and explain it with the above-given program code.

ii) Mention some of its merits and demerits. **(10M)**

Q4. The municipal corporation of Vijayawada city has given a contract to a software company to develop a Disaster Management System (DMS) to avert the fatalities that may be caused by cyclones during the summer monsoon season. The software company has then gathered all the key information domain measures or metrics to develop this software and to measure the functionality delivered by this software system. The required information domain values are: four external inputs (EIs), three external outputs (EOs), two external inquiries (EQs), two internal logical files (ILFs), and four external interface files (EIFs). The weighting factor for each information domain value for assessing the complexity are: Els- simple as value 3, Eos- simple as value 4, EQs- average as value 4, ILFs- average as value 10, EIFs- complex as value 10. The total value adjustment factor (VAF) is considered 42 which corresponds to the average complexity of the software product.

    i) For the above-given problem, Identify the software metrics and illustrate with a neat sketch.

    ii) Calculate the function point analysis of the above-given problem. **(10M)**

Q5. A software company has decided to develop an Agricultural Monitoring System (AMS) to monitor agricultural productivity from remote areas. During the design phase of the software development life cycle, they have designed the software such that the main program or subprogram modules are distributed in different workstations in a network of many computers. The subordinated modules or components located in remote areas will be invoked by the main program located at the central workstation. While developing the software, the manager asked its developer and testing group to assess or measure the quality of software design using software quality metrics or indicators to ascertain the overall quality of the software.

    i) Identify the design model metrics and calculate the quality index of the software design considering the number of components in the program and number of database items required etc. based on the above-given software design scenario.

    ii) Also discuss the complexity of the above-given software design scenario with neat sketch. **(10M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	3	3	1	-	1	10
Q2	3	3	1	-	1	10
Q3	3	3	2	-	1	10
Q4	4	4	4	-	1	10
Q5	4	4	4	-	1	10

QUESTION PAPER

Name of the Examination: CAT – 2 (Winter 2021-2022)

Course Code: CSE1005

Class Id: AP2021225000159

Total Marks: 50

Duration: 90 min

Course Title: Software Engineering

Slot: C2+TC2

Date of Exam: 20/4/22

1. Who should perform the Validation Test- the software developer or the software user? Justify the Answer with the various tasks by taking Vehicle Booking as On-going Project. (10 Marks)

2. Assume that you are in the testing process of the E-Shopping Application. Specify with a framework how will you develop a continuous improvement approach for the testing process. (10 Marks)

3. Consider the Online Voting systems in under development. Identify some testability features will support for easy Program Testing for the application said. (10 Marks)

4. 4. Assume that you are given a role of quality manager in the development of Safe Home Systems applications. How will justify the design structure quality index for the application specified.

(10 Marks)

5. Compute the function point value for a project with the following information domain characteristics

Number of User Inputs: 44
Number of User Outputs: 32
Number of User Inquiries: 26
Number of files: 5
Number of External Interfaces: 6
Assume that all Value Adjustment Factors takes complex value. (10 Marks)

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	3	3	1,2,4,5,9,10	-	1	10
Q2	3	3	1,2,4,5,9,10	-	1	10
Q3	3	3	1,2,4,5,9,10	-	1	10
Q4	4	4	4,9,10,11	-	1	10
Q5	4	4	4,9,10,11	-	1	10

QUESTION PAPER

Name of the Examination: CAT – 2 (Winter 2021-2022)

Class ID: AP2021225000162

Course Code: CSE1005

Course Title: Software Engineering

Slot: C2+TC2

**Date of Exam:** 20.04.2022

Duration: 90 min

Total Marks: 50

Instructions:

➤ Assume data wherever necessary.

➤ Any assumptions made should be clearly stated.

➤ Answer all questions.

➤ No clarification during the examination; answer the questions as per your best understanding (carry marks).

Q1.   a) "White Box Testing a complement of Black Box Testing" – Comment on this statement with proper justification.   **(6M)**

b) Is it possible to validate a software before verification? Justify your answer with suitable example(s).   **(4M)**

Q2.   a) "For top-down integration, we usually require stubs but no drivers." – Comment on this sentence with justification and example.   **(5M)**

b) "If a software is designed with high-coupled and low-cohesive modules, it is easy to perform most of the testing" – Do you agree? Why?   **(5M)**

Q3.   Suppose you are trying to build an app (smartphone application) to calculate income tax. For the simplicity, assume that income tax is calculated based on the following rules:

I.   If the age of an employee is less than 40, then tax payable is as follows:
   a.   If annual income<300000, no tax.
   b.   If annual income 300001-500000, tax is 10% of total income.
   c.   If annual income is more than 500000, tax is 20% of total income.

II.   If the age of an employee is 40 or above, they will have 5% deduction of tax.

III.   A woman employee is required to pay 5% less than men employee.

a)   Draw the flow diagram for the tax calculation module of your app.   **(2M)**

b)   Following the Equivalence Partitioning method, define equivalence classes and design test cases for this module.

   (8M)

Q4.   Consider the following DFD as a requirement model for a hotel room booking module for a hotel management system. Using a function-based metric (FP = count total $\times$ [0.65 + 0.01 $\times$ Σ (Fi)]),

compute the value of FP. Assume that all the weighting factor for all information domain value is average. Also, assume that the computed value adjustment factor identified (using a 5-point rating scale) is 56. **(10M)**
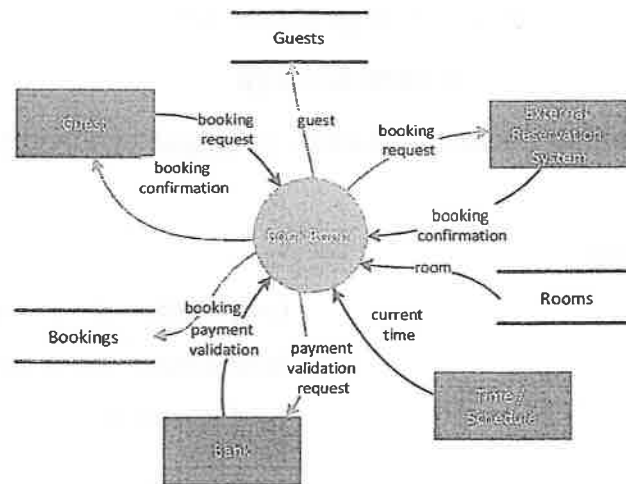
Q5. Consider the following C program:

```
main()
{
    int a, b, c, mean, freq;
    scanf("%d %d %d", &a, &b, &c);
    avg = (a+b+c)/3;
    freq = max(a, b, c);
    printf("mean = %d", avg);
    printf("freq = %d", freq);
}
```

Using Halstead's metric for source code, compute

i)   program volume,
ii) difficulty,
iii) effort,
iv) time required to program, and
v)   estimated bugs   **(10M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	3	3	1,2,4,5,9,10	3	1	10
Q2	3	3	1,2,4,5,9,10	3	1	10
Q3	3	3	1,2,4,5,9,10	2,3	1	10
Q4	4	4	2,3,4,8,9,10,11	4	1	10
Q5	4	4	2,3,4,8,9,10,11	4	1	10

QUESTION PAPER

Name of the Examination: CAT – 2 (Winter 2021-2022)

Course Code: CSE1005

Slot: C2+TC2

Duration: 90 min

Class ID: AP2021225000532

Course Title: Software Engineering

Date of Exam: 20-04-2022

Total Marks: 50

Instructions:

1. Assume data wherever necessary.
2. Any assumptions made should be clearly stated.

Q1. "It is necessary to introduce the testing strategy which ensures that modifications or changes made by adding a new program module do not affect or break the functioning of the software program. As a result, when a new version of a software is released, the flaws or bugs are automatically repaired.".

   i) Identify the testing strategy and demonstrate it with a real-time example.
   ii) List the merits and demerits of the chosen testing strategy. **(10M)**

Q2. "Software testing intentionally ignores control structure, focuses on the information domain, and applies to test in the later stages of the process". The above narrative is ideal for software testing.

   i) Identify the testing strategy and explain it with the help of a real-time example.
   ii) Mention some of its advantages and disadvantages. **(10M)**

Q3. A software solution company has started developing software for a client. While developing, the testing group was asked to test the independent paths of the given program code and create the graph matrices.

```
int isequal(int x, int y)
{
   if(x==y)
        return 1;
   else if(x==-y)
        return -1;
   else
        return 0;
}
```

   i) Identify the testing strategy and demonstrate it with the above-given program code.
   ii) Calculate the cyclomatic complexity of the flow graph derived from the above-given program code. **(10M)**

Q4. Tamil Nadu Government has given a contract to a software solution company to develop a weather forecasting system to monitor the frequent climate changes during the monsoon

season to prevent any damages that might be caused by sudden bad weather. Further, the software developers are asked to produce high-quality software without any kind of error or fault. So, the manager has asked its developers and teams to test the quality of the software before releasing the software finally to the client.

    i) Describe the above scenario in the context of product metrics, project metrics, and process metrics to measure the quality of the software.

    ii) Also discuss the characteristics of software quality metrics based on the above scenario. **(10M)**

Q5. A software solution firm intends to develop a market stock management system. Before translating into coding, they have first designed the software in a call and return procedure during the modeling phase of the software development life cycle. Developers and testing teams were asked by the manager to ensure that quality software product is produced. To ensure that, they have tested the quality of software design using software quality metrics or indicators. For accurate testing purposes, they have collected the information domain values regarding the software design model. In the design model, they have considered 100 components in program architecture (s1), 37 components whose correct function is determined by the source of input data (s2), 35 components whose correct function depends on previous processing (s3), 15 database items (s4), 7 different database items (s5), 2 database segments (s6), and 2 components having single entry and exit (s7).

    i) From the above design scenario, identify the design model metrics and illustrate with a neat sketch.

    ii) Calculate the design quality index from the above-given scenario. Also, discuss its complexity. **(10M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	3	3	1	-	1	10
Q2	3	3	1	-	1	10
Q3	3	3	2	-	1	10
Q4	4	4	4	-	1	10
Q5	4	4	4	-	1	10

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QUESTION PAPER

Name of the Examination: Re-CAT (Winter 2021-2022)

Class ID: All Class IDs for CSE1005 (Software Engineering) Course

Course Code: CSE1005   **Course Title:** Software Engineering

Slot: All Slots   **Date of Exam:** May 2022

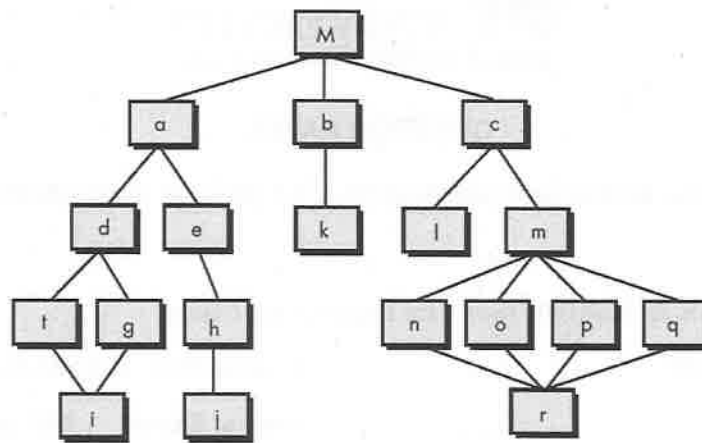**Duration:** 90 min   **Total Marks:** 50

Instructions:

 ➤ Assume data wherever necessary.
 ➤ Any assumptions made should be clearly stated.
 ➤ Answer all questions.
 ➤ No clarification during the examination; answer the questions as per your best understanding (carry marks).

Q1. **a)** "Alpha-Testing can be considered as a supplement of Beta-Testing" – Comment on this statement with proper justification. **(6M)**

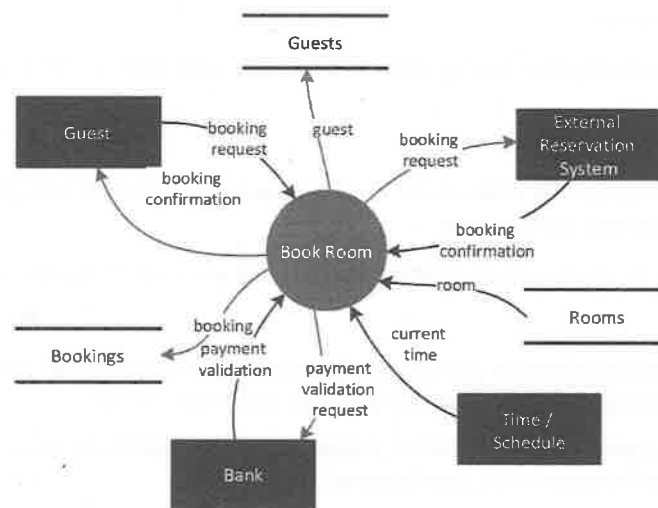   **b)** Is it possible to conduct Beta-Testing at the developers' site? Justify your answer. **(4M)**

Q2. **a)** "Software testing activities can be considered as destructive and at the same time constructive activities" – do you agree with this statement? Why? **(5M)**

     b) "To deliver a good quality software, testing should explicitly be done by developers" – comment on this sentence with justification. **(5M)**

Q3. Suppose you are trying to build an app (smartphone application) to calculate income tax. For the simplicity, assume that income tax is calculated based on the following rules:

     I.   If the age of an employee is less than 40, then tax payable is as follows:
         a.   If annual income<300000, no tax.
         b.   If annual income 300001-500000, tax is 10% of total income.
         c.   If annual income is more than 500000, tax is 20% of total income.
     II.   If the age of an employee is 40 or above, they will have 5% deduction of tax.
     III.   A woman employee is required to pay 5% less than men employee.

     a) Draw the flow diagram for the tax calculation module of your app.
     b) Construct the control-flow graph for it.
     c) Compute the cyclomatic complexity based on McCabe's model.
     d) Conclude on the hardness of the program based on this calculation, with a proper justification.
                                                       (10M)

Q4. Consider the following diagram as a design model of a software module. Using Fenton's architectural design metrics, compute the module's size, depth, width, and arch to node ratio. **(10M)**

Q5. Consider the following DFD as a requirement model for a hotel room booking module for a hotel management system. Using a function-based metric (FP = count total $\times$ [0.65 + 0.01 $\times$ Σ (Fi)]), compute the value of FP. Assume that all the weighting factor for all information domain value is average. Also, assume that the computed value adjustment factor identified (using a 5-point rating scale) is 56. **(10M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	3	3	1,2,4,5,9,10	3	1	10
Q2	3	3	1,2,4,5,9,10	3	1	10
Q3	3	3	1,2,4,5,9,10	3	1	10
Q4	4	4	2,3,4,8,9,10,11	4	1	10
Q5	4	4	2,3,4,8,9,10,11	4	1	10

QUESTION PAPER

Name of the Examination: CAT (Long Summer 2021-2022)

Course Code: CSE1005   Course Title: Software Engineering

Slot: B+TB+TBB   Date of Exam: 02-07-2022

Duration: 90 min   Total Marks: 50

Class ID: AP2021228000030

Instructions:

1. Assume data wherever necessary.

2. Any assumptions made should be clearly stated.

Q1. A client has asked a software developer company to develop a mobile app for running his autocar business which provides services like repairing, car resale, customer support etc. Client does not have any technical knowledge and is not able to provide a clear requirement. Under such circumstances which process model will be best suited or should be used by the developer. Explain. **(10M)**

Q2. "The process model is useful when an early or intermediate software system delivery rather than a single delivery is required and is a module-by-module based working process that combines elements of the classical model and applies them in an iterative fashion." The above narrative is ideal for the software process model.

    i)   Recognize the model and describe it using a clear illustration. **(5M)**
    ii) Demonstrate the model's operating concept using a real-time example. **(5M)**

Q3. Suppose, you are asked to develop a mobile app software for a Tourism company that includes services like transportation, travel, accommodation, information, entertainment, guidance and so on services to satisfy the tourists needs.

    i)   List out all its functional and non-functional requirements. **(4M)**
    ii) Draw Use-Case and Class Diagram. **(6M)**

Q4. a) How important role a design pattern and quality design plays in software development? Justify your answer with suitable example. **(5M)**

b) Describe the working principle of Remote Procedure Call architectural style in designing a software with real time example. **(5M)**

Q5. What is the main difference between White Box Testing and Black Box Testing? Under which conditions in software development life cycle these two-testing strategy will be used? Create a set of test cases and explain with real time project implementation that you have considered using Basis Path Testing to ensure that all statements have been executed. **(10M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1	1	1, 2, 3, 10	-	1	10
Q2	1	1	1, 2, 3, 9, 10	-	1	10
Q3	2	2	1, 2, 3, 4, 5	-	1	10
Q4	2	2	1, 2, 3, 4	-	1	10
Q5	3	3	1, 2, 4	-	1	10

QUESTION PAPER

Name of the Examination: CAT (Long Summer 2021-2022)

Course Code: CSE1005   **Course Title: Software Engineering**

Slot: D+TD+TDD   **Date of Exam: 05-07-2022**

Duration: 90 min   **Total Marks: 50**

Class ID: AP2021228000420

Instructions:

1. Assume data wherever necessary.
2. Any assumptions made should be clearly stated.

Q1.   **a)** "Software does not wear out but hardware does wear out". Justify your answer with example.   **(4M)**

b) In which conditions or situations, the RAD process model will be useful while developing a software? How the unskilled developers will impact the software development life cycle? Explain with an example in context with RAD model.   **(6M)**

Q2.   As a software developer, you are asked to develop a software and also advised to keep consistent communication with the client to avoid any kind of possible risk that could happen in the later stage. In such a case, which software development life cycle or software process model will be highly useful? Explain with example. Also list out the merits and demerits of the chosen software process model.   **(10M)**

Q3.   **a)** What will be the impact of improper or inconsistent gathering of requirements during the software development process? How important role an Elicitation of requirements plays while gathering the requirements for software development? Explain with an example.   **(6M)**

b) What is functional and non-functional requirements? List out the functional and non-functional requirements for "VTOP" application of VIT-AP University.   **(4M)**

Q4.   Consider that you have been asked to create a mobile app for the restaurant by the owner of the restaurant that will allow customers to order and receive coffee, tea and other items online. Assume that "Fresh Up" is the app's proposed name as well.

   i)   Draw activity diagram for "Fresh Up".   **(5M)**
   ii) Draw sequence diagram for "Fresh Up".   **(5M)**

Q5.   **a)** During the testing of the software development, the testing strategy is used to find the region fault in the faulty logic in the software. Identify the testing strategy and explain with proper example.   **(6M)**

b) "White Box Testing is used during the system testing of the software development". Is the statement True or False? Justify your answer with suitable example.   **(4M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1	1	1, 2, 3, 10	-	1	10
Q2	1	1	1, 2, 3, 9, 10	-	1	10
Q3	2	2	1, 2, 3, 4	-	1	10
Q4	2	2	1,2, 3, 4, 5	-	1	10
Q5	3	3	1, 2, 4	-	1	10

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QUESTION PAPER

Name of the Examination: FAT (Winter 2021-2022)

Course Code: CSE1005

Slot: : B1+TB1

Duration: 120 min

Course Title: Software Engineering

Date of Exam: 24.5.22

Total Marks: 60

1. Write a Software Requirement Specification for "A food delivery service mobile app" by having the following Contents with detailed Explanation. (10 Marks)
   - Overall description
   - Functional Requirements
   - Non Functional Requirements
   - Interface Requirements

2. Select a software component that you have designed and implemented recently. Design a set of test cases that will ensure that all statements have been executed using basis path testing (10 Marks)

3. Compute the Estimated Project Cost and Estimated Efforts for a project with the following information domain characteristics. Value adjustment factors will take complex values (10 Marks)
   - Number of User Inputs: 64
   - Number of User Outputs: 32
   - Number of User Inquiries: 22
   - Number of files: 10
   - Number of External Interfaces: 3

   Assume that the organizational average productivity = 6.5 FP/pm. and the Labour rate = Rs.9000 per month.

4. "The degree of sociability (communication) required for the project" and "The time that the team will stay together (team lifetime)". Justify with examples whether the mentioned factors will influence the selection in software project team structure. (10 Marks)

5. Garvin describes five different views of quality. Provide an example of each using one or more well-known software applications with which you are familiar and justify whether the proposed quality factor is required for the applications. (10 Marks)

6. Do some research on the efficacy of business process reengineering? Present pros and cons arguments for this approach. (10 Marks)

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	2	CO2	1,2,4,5,9,10	-	1	10
Q2	3	CO3	1,2,4,5,9,10	-	1	10
Q3	5	CO5	2,3,4,8,9	-	1	10
Q4	5	C05	2,3,4,8,9	-	1	10
Q5	6	C06	4,9,10,11	-	1	10
Q6	6	C06	4,9,10,11	-	1	10

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QUESTION PAPER

FAT (Winter 2021-2022)

Course Code: CSE1005   **Course Title:** Software Engineering

Slot: B2+TB2 Slot   **Date of Exam:** 24-05-2022

Duration: 120 mins   **Total Marks: 60**

Q1. (a) "When your customer has a legitimate need, but is clueless about the details, develop a prototype as a first step". The above narration is well suited for a process model for software development. Identify the model and explain with a neat sketch. List the advantages and disadvantages of the identified process model. **(5M)**

   (b) A college has decided to develop a system to manage students and faculty activities through online application. Sketch class diagram to represent the requirement model. **(5M)**

Q2. (a) Given following values, calculate functional point when complexity adjustment factors are significantly and Average product and weight factors are complex.
   User Input=45
   User Output=25
   User Enquires=30
   User Files=7
   User Interfaces=5   **(10M)**

Q3. Consider a software project using semi-detached and embedded mode with 30,000 lines of code. Calculate the effort (E) is required in term person per month (PM), Duration (D) and Person(P) to implement the project using COCOMO Model. **(10M)**

Q4. A project engineer has planned to make 100 lines of code on the First day with the cost of $100, 200 lines of code on the second day with the cost of $200 and 300 lines of code on the Third day with the cost of $300. The actual cost of project making is $150 for 50 LOC. Calculate the Earned value (EV), Cost variance, Schedule variance (SV), Cost performance Index (CPI), Schedule performance Index (SPI). **(10M)**

Q5. Explain Software maintenance models. **(10M)**

Q6. Illustrate different kind of software maintenance and identify the type of maintenance for the following scenarios:
   - Code rebuilding to reduce the complexity in the source code
   - Modification in the reservation system to run on new platform
   - Changes in the login page to avoid cause in design

   (10M)

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1,2	CO1, CO2	1,2,3,9,10	-	1	10
Q2	4	CO3	1,2,3,9,10	-	1	10
Q3	5	CO4	2,3,4,8,9,10	-	1	10
Q4	5	CO5	2,3,4,8,9,10	-	1	10
Q5	6	CO6	2,3,4,8,9,10	-	1	10
Q6	6	CO6	2,8,9,10	-	1	10

School of Computer Science and Engineering

Name of the Examination: FAT (Winter 2021-2022)

Course Code: CSE1005

Slot : B1+TB1

Duration: 120 min

Course Title: Software Engineering

Date of Exam: 24.05.2022

Total Marks: 60

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1. Mr. Jack wants to develop a new software application for online food ordering. He identified initially the primary set of functionalities like Registration, ordering, payment, delivery. Later he wishes to add some of the secondary functionalities like offers on food ordering, coupons, suppliers' details, recruitment, franchise and payment types to the existing functionalities.
   Identify the **suitable process model** for the above case study and explain the model with respect to the system and list out the *merits and demerits* of the same. **[10M]**

2. Write an Algorithm to read a two-dimensional (3 X 3) matrix, sum all the element values in the second column of the matrix then find the obtained sum value is a prime number or not.
   Test the above program with the help of **Basis-Path testing techniques** and **Justify**. **[10M]**

3. Suppose an online employment application is to be developed with the following services and estimated LOC for the services are: registration page 13 K, data entry 20 K, login page 5K, images/docs uploading 3K, and report generation 4K. Compute the Initial effort, Development Time, Productivity and Staff size for the above-mentioned project using suitable Basic and Intermediate **COCOMO Models**. Assume nominal modern programming practices, very high product complexity, and high programmer capability. **[10 M]**

4. Assume you are a Project Manager and you are asked to compute **EVA for a Project contains 20 tasks.** The Project Schedule Indicates 15 Tasks should have been completed, due to continuous change requests 9 tasks are completed by the defined dead line. Assume the actual cost of work performed is $150. Calculate the values of Schedule Performance Index, Schedule variance, Cost Performance Index, Cost Variance, percent scheduled for completion, and percent complete.
   The following scheduling data (in Person-days) are available. **[10M]**

Task	Planned Effort	Actual Effort
1	8	6.5
2	12	14
3	10	13
4	5.5	7.5
5	13	9
6	10.5	8.5
7	12	11.5

8	7	8
9	9.5	8
10	8	----
11	7	----
12	9	----
13	12	----
14	7	----
15	12	----
16	10	----
17	5	----
18	9.5	----
19	7	----
20	13	----

5. What is verification and validation? Is it possible to assess the quality of software if the customer keeps changing what it is supposed to do?   **[10M]**

6. Consider any Project that you have done in the last three years. Describe the business process in which you played a part. Use the **Business Process Reengineering model** to recommend changes to the process in an effort to make it more efficient.   **[10M]**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PSO Mapped	Marks
Q1	1	1	1,2,3,9,10	1	10
Q2	3	3	1,2,4,5,9,10	1	10
Q3	5	5	2,3,4,8,9,10	1	10
Q4	5	5	2,3,4,8,9,10	1	10
Q5	6	6	4,9,10	1	10
Q6	6	6	4,9,10	1	10

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QUESTION PAPER

FAT (Winter 2021-2022)

Course Code: CSE1005

Slot: C2+TC2

Duration: 120 min (2 hrs)

Course Title: Software Engineering

Date of Exam: 25 May 2022

Total Marks: 60

Instructions:

➤ Assume data wherever necessary.

➤ Any assumptions made should be clearly stated.

➤ No clarification during the examination; answer the questions as per your best understanding (carry marks).

➤ Answer all questions.

Q1. Suppose you are trying to build an app (smartphone application) to calculate income tax. For simplicity, assume that income tax is calculated based on the following rules:

I. If the age of an employee is less than 40, then tax payable is as follows:
   a. If annual income<200000, no tax.
   b. If annual income 200001 - 500000, tax is 10% of total income.
   c. If annual income is more than 500001 - 1000000, tax is 15% of total income.
   d. If annual income is more than 1000000, tax is 20% of total income.
II. If the age of an employee is 40 or above, they will have 5% deduction of tax.
III. A woman employee is required to pay 5% less than men employee.
IV. If the employee work in academic institute, there will be additional deduction 5% deduction of tax.

a) Draw the flow chart for the tax calculation module of your app.
b) Construct the control-flow graph for it.
c) Compute the cyclomatic complexity based on McCabe's model.
d) Conclude on the hardness of the program based on this calculation, with a proper justification.

(3+2+3+2 = 10M)

Q2. Suppose you have been asked to develop a smartphone app for "Swagat" restaurant of VIT-AP University for ordering and serving tea, coffee, and snacks. Also, assume that the proposed name of the app is "Swagat-Online".

A) Identify all the functional and non-functional requirements for "Swagat-Online". (4M)

B) Draw use-case and class diagrams for "Swagat-Online". (6M)

3. An effective software project management focuses on the four P's: people, product, process, and project. How important is the order of these four P's? Justify your answer with a suitable example.

(10M)

4. **A)** One option to achieve reliable cost and effort estimates is "delay estimation until late in the project". Although it is possible to achieve even 100% accurate estimation following this approach, no organization follows this; Why? **(4M)**

B) How COCOMOII is different from COCOMO? **(2M)**

C) "Now a days the 40-20-40 rule for effort distribution is no more followed" – Comment on this sentence with justification and example. **(4M)**

5. With a suitable example explain how software quality control is different from software quality assurance? How the CMMI is different from the CMM (make a comparison chart)? With justification mention the main aspect(s) that should be focused for risk management?

(3+4+3=10M)

6. **A)** "Software supportability is not exactly the same as software maintenance" – Comment on this statement with justification and example. **(5M)**

B) How reverse engineering help us to better understand the software development process? **(5M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	3	3	1,2,4,5,9,10	3	1	10
Q2	2	2	1, 2, 3, 4, 5, 9, 10	1, 3	1, 2	10
Q3	5	5	2, 3, 4, 8, 9, 10, 11	4, 5	1	10
Q4	5	5	2, 3, 4, 8, 9, 10, 11	4, 5	1	10
Q5	6	6	4, 9, 10, 11	6	1	10
Q6	6	6	4, 9, 10, 11	6	1	10

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QUESTION PAPER

FAT (Winter 2021-2022)

Course Code: CSE1005

Slot: C2 + TC2

Duration: 90 min

Course Title: Software Engineering

Date of Exam: 25 May 2022

Total Marks: 60

Instructions:

1. Assume data wherever necessary.

2. Any assumptions made should be clearly stated.

Q1. You have been appointed a project manager for a small software products company. Your job is to build a breakthrough product that combines virtual reality hardware with state-of-the-art software. Because competition for the home entertainment market is intense, there is significant pressure to get the job done. What team structure would you choose and why? What software process model(s) would you choose and why? **(12M)**

Q2. Why is it that software organizations often struggle when they embark on an effort to improve local software process? **(12M)**

Q3. There is a subtle difference between restructuring and forward engineering. Explain with an example. **(12M)**

Q4. "Unreasonable" deadlines are a fact of life in the software business. How should you proceed if deadlines are not met? **(12M)**

Q5. Why does an iterative process make it easier to manage change? Is every agile process employed for project implementation iterative? Explain. **(12M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	5	3	2	3	2	12
Q2	6	2	3	2	2	12
Q3	6	2	2	3	3	12
Q4	5	3	4	4	3	12
Q5	1	3	4	3	2	12

QUESTION PAPER

Name of the Examination: FAT (Long Summer 2021-2022)

Course Code: CSE1005

Slot: B+TB+TBB

Duration: 120 min

Class ID: AP2021228000030

Course Title: Software Engineering

Date of Exam: 29-07-2022

Total Marks: 60

Instructions:

1. Assume data wherever necessary.
2. Any assumptions made should be clearly stated.

Q1. a) How important role an architectural design metrics plays in software development process? What are the characteristics of good design metrics and its impact in development process?

b) Consider a software project that you have done recently where you have collected the information domain values about the software design model for accurate testing purposes. Based on your project design, calculate the software quality index considering the number of components in the program and the number of database items required etc. Also discuss its complexity.

(4M+6M=10M)

Q2. What is Function Point (FP) Metric? Suppose you are asked to build an Agricultural Monitoring System to assess the agricultural productivity. Consider the information domain values required for the mentioned software application and calculate the Function Point analysis of the same. Also describe the characteristics that can be used to judge the quality or effectiveness of the requirements model that Davis and his colleagues have proposed. **(10M)**

Q3. Calculate the project's estimated cost and effort for a project with the information domain criteria shown below. Factors for value adjustment will consider complex values.

- Number of User Inputs: 66
- Number of User Outputs: 34
- Number of User Inquiries: 24
- Number of files: 10
- Number of External Interfaces: 5

Assume that the labour rate is Rs. 9000 per month and that the organisational average productivity is 6.5 FP/pm. **(10M)**

Q4. a) The 40-20-40 guideline for effort distribution is no longer observed, according to a recent study. Comment on this sentence with support and example. **(5M)**

b) Deadlines that are "unreasonable" are a reality of life in the software industry. How will you know whether your software development is ahead or behind the deadline? Justify with an example. **(5M)**

Q5. a) Describe the differences between software quality control and software quality assurance using an appropriate example.   **(3M)**

b) Mention, with rationale, the primary aspects on which risk management should be focused. Are the CMM and CMMI same? Justify.   **(3M+4M=7M)**

Q6. a) What role does reverse engineering play in our ability to comprehend the software development process?   **(5M)**

b) "Software maintenance and software supportability are not the same thing at all." — Comment on this assertion with support and example.   **(5M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	4	4	4, 9,10,11	-	1	10
Q2	4	4	4, 9, 10, 11	-	1	10
Q3	5	5	2, 3, 4, 8, 9, 10,	-	1	10
Q4	5	5	2,3,4,8,9,10	-	1	10
Q5	6	6	4,9,10, 11	-	1	10
Q6	6	6	4, 9, 10, 11	-	1	10

QUESTION PAPER

Name of the Examination: FAST TRACK (Fall 2022-2023)

Course Code: CSE1005	**Course Title: Software Engineering**
Slot: B+TB+TBB	**Date of Exam: 29-07-2022**
Duration: 90 min	**Total Marks: 50**

Class ID: AP2022231000037

Instructions:

1. Assume data wherever necessary.

2. Any assumptions made should be clearly stated.

Q1. Consider the **Online Hotel Booking** system and identify the below system requirements and write the Software Requirement Specification (SRS) for the same.

      a. Purpose of the System (2)

      b. Identify functional requirements of the system (2)

      c. Identify individual module deliverables (6) **(10M)**

Q2. Which process model is best suited for risk management? Discuss in detail with an example. Give its advantages and disadvantages? **(10M)**

Q3. What is the purpose of data flow diagrams? What are the notations used for the same? Explain by constructing a context flow diagram level -0 DFD, level-1 DFD and level-2 DFD for Institution Management System. **(10M)**

Q4. Consider the process of ordering a pizza over the phone. Draw the use case diagram and also sketch the activity diagram representing each step of the process, from the moment you pick up the phone to the point where you start eating the pizza. Include activities that others need to perform. Add exception handling to the activity diagram you developed. Consider at least two exceptions.(Ex : Delivery person wrote down wrong address, deliver person brings wrong pizza). **(10M)**

Q5. What is cyclomatic complexity? Compute cyclomatic complexity for the following code with flowgraph representation.

```
IF A = 10 THEN
IF B > C THEN
  A = B
ELSE
  A = C
ENDIF
ENDIF
Print A
Print B
Print C          (10M)
```

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1	CO2	PO2		PSO2	10
Q2	1	CO1	PO1		PSO1	10
Q3	2	CO2	PO2		PSO2	10
Q4	2	CO2	PO3		PSO2	10
Q5	3	CO3	PO4		PSO1	10

QUESTION PAPER

Name of the Examination: FAT (Long Summer 2021-2022)

Course Code: CSE1005

Slot: D+TD+TDD

Duration: 120 min

Class ID: AP2021228000420

Course Title: Software Engineering

Date of Exam: 01-08-2022

Total Marks: 60

Instructions:

1. Assume data wherever necessary.
2. Any assumptions made should be clearly stated.

Q1. a) How important role the software quality metrics plays in deciding and developing a software application? If suppose the software application that you are building does not meet expected quality, then what action will you be undertaking to meet the required quality? Justify your response with suitable example.

b) Also discuss some characteristics or properties of a good software quality metrics.

(8M+2M=10M)

Q2. A software business has been contracted by the municipal corporation of Hyderabad city to create a Disaster Management System (DMS) in order to prevent any fatalities brought on by cyclones during the summer monsoon season. In order to construct this software and evaluate the functionality that this software system provides, the software company then gathered all the essential information domain measurements or metrics. Four external inputs (EIs), three external outputs (EOs), two external enquiries (EQs), two internal logical files (ILFs), and four external interface files make up the required information domain values (EIFs). For the purpose of determining complexity, the following weighting factors are used for each information domain value: EIs is simple as value 3, Eos is simple as value 4, EQs is average as value 4, ILFs is average as value 10, and EIFs is complicated as value 10. The average complexity of the software product is 42, which is the overall value adjustment factor (VAF). Determine the function point analysis for the aforementioned problem and illustrate with a neat sketch.

(10M)

Q3. The four Ps—people, product, process, and project—are the focal points of an efficient software project management strategy. How crucial is the sequence of these four Ps? Provide a suitable example to support your response. **(10M)**

Q4. a) Suppose an online employment application is to be developed with the following services and estimated LOC for the services are: registration page 13 K, data entry 20 K, login page 5K, images/docs uploading 3K, and report generation 4K. Compute the Initial effort, Development Time, Productivity and Staff size for the above-mentioned project using suitable Basic COCOMO Model. Assume nominal modern programming practices, no tight project deadline, and high programmer capability. **(6M+4M=10M)**

b) What distinguishes COCOMOII from COCOMO? Explain with example.

Q5. a) Describe how you would assess the quality of Industry/Company before applying a job in it. What factors would be important? Which would be critical? **(6M)**

b) Mention the primary aspect(s) on which risk management should be concentrated with reason. **(4M)**

Q6. a) Calculate the cost of maintaining a software package with a total of 66000 lines of code in which 90000 lines of coding were added and 4500 lines of coding were removed during maintenance. The project's development cost was 5 lacs. **(3M)**

b) There is a subtle difference between restructuring or reverse engineering and forward engineering. Explain with an example. **(7M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	4	4	4, 9,10,11	-	1	10
Q2	4	4	4, 9, 10, 11	-	1	10
Q3	5	5	2, 3, 4, 8, 9, 10,	-	1	10
Q4	5	5	2,3,4,8,9,10	-	1	10
Q5	6	6	4,9,10, 11	-	1	10
Q6	6	6	2, 4, 9, 10	-	1	10

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QUESTION PAPER

Name of the Examination: WINTER 2022-2023 – CAT-1

Course Code: CSE 1005

Course Title: Software Engineering

Set number: 2

Date of Exam: 16-02-2023 (AN) (CD₂)

Duration: 90 minutes

Total Marks: 50 marks

Instructions:

1. Assume data wherever necessary.
2. Any assumptions made should be clearly stated.

Q1. What are the advantages and disadvantages of developing software in which quality is "good enough"? That is, what happens when we emphasize development speed over product quality? **(15M)**

Q2. Umbrella activities occur throughout the software process. Do you think they are applied evenly across the process, or are some concentrated in one or more framework activities? **(10M)**

Q3. Consider a public library system, where common man can enrol for membership by paying a nominal fee and access library facility. The library provides service to its members by allowing them to borrow books for two weeks. If the member wants to retain the book for few more days, it can be renewed by two more weeks. If the member doesn't return the book within stipulated time period, then a fine of Rs. 5/- per day is charged. Describe the above scenario with the help of use-case diagram, and sequence diagram. **(15M)**

Q4. Describe about the design concepts briefly for successful development of software. **(10M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1	1	1	1	1	15
Q2	1	1	1	2	1	10
Q3	1	1	1	2	2	15
Q4	2	2	4	1	2	10

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QUESTION PAPER

Name of the Examination: WINTER 2022-2023 – CAT-1

Course Code: CSE1005
Course Title: Software Engineering

Set number: 3

Date of Exam: 16-02-2023 (FN) (D1)

Duration: 90 minutes
Total Marks: 50M

Instructions:

1. Assume data wherever necessary.
2. Any assumptions made should be clearly stated.

Q1. "Particularly useful when staffing is unavailable for a complete implementation by the business deadline". The above narration is well suited for a process model for software development.

i) Identify the model and explain with a neat sketch.

ii) Give an example, that clearly demonstrates the working principle of the model. **(15M)**

Q2. A) List and explain various process framework activities in SDLC.

B) Explain the about concept of layered engineering in software development. **(15M)**

Q3. A university plans to manage Library Management System (LMS) through online application.

i) Identify the actors, functions/requirements for the above case study and sketch use case diagram.

ii) Illustrate the requirement model using class diagram **(10M)**

Q4. Prepare a SRS Document for the Hospital Management System with the Purpose, Scope, Intended audience, Modules required etc., **(10M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1	1	1	1	1	15
Q2	1	1	1	1	1	15
Q3	2	2	1,2,4,5	1,2	1	10
Q4	2	2	1,2,4,5	1,2	1	10

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QUESTION PAPER

Name of the Examination: CAT 1 (WINTER 2022-2023)

Course Code: CSE 1005

Course Title: Software Engineering

:. Set No: 05

Date of Exam: 17/02/2023 (CFN)

Duration: 90 min

Total Marks: 50 (E₁)

Instructions:

1. Assume data wherever necessary.
2. Any assumptions made should be clearly stated.

Scenario: Human Resource management system project involves new and/or system upgrades of software of send to capture information relating to the hiring termination payment and management of employee. He uses system to plan and analyze all components and performance of metrics driven human resource functions, including recruitment, attendance, compensation, benefits, and education. Human resources management systems should align for maximum operating efficiency with financial accounting operations customer relationship management, security and business lines as organization. Customer is flexible with basic features and working prototype, rest features can be provided in an incremental process and also has a maximum development time.

Q1. a) List and explain various process framework activities in SDLC. [5M]

b) Justify which process model you use for the development of a software for the scenario given above. [10M]

Q2. a) What are fourth generation techniques, give some examples following its advantages and disadvantages. [5M]

b) Explain the about concept of layered engineering in software development. [5M]

Q3. a) What do you mean by feasibility study? List and explain various types of feasibility studies. [3M]

b) For the scenario given above, prepare SRS document. [12M]

Q4. Explain about various design concepts useful during software design process. [10M]

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1	1	1	1	1	15
Q2	1	1	1	1	1	10
Q3	2	2	1,2,4,5	1,2	1	15
Q4	2	2	1,2,4,5	1,2	1	10

QUESTION PAPER

Name of the Examination: FAST TRACK FALL 2023-2024 – CAT

Course Code: CSE1005

Set number: 2

Duration: 90 minutes

Course Title: Software Engineering

Date of Exam: 04/07/2023 (FN) (B₁)

Total Marks: 50

Q1. For a project E-Book Management system, the website has to be maintained properly since the whole e-book purchase process can be improved. E-Book management in this project gives the idea about how E-Book are maintained in a particular concern. The book details include the number of books available, no of pages and price. E-Book management system is understood by going through the modules that is being involved. Discuss and Apply suitable software development lifecycle model **(10M)**

Q2. Andhra Pradesh State Road Transport Corporation (APSRTC) plans to improve the Bus Ticket Reservation System (BTRS) through online applications to provide passengers with more easy and sophisticated reservation system.

i) Analysis the case study and identify the actors, functions and draw usecase diagram. **(5M)**
ii) Sketch class diagram to represent the requirement model. **(5M)**

Q3. A software firm intends to launch an online departmental store that would allow users or customers to purchase grocery items according to their needs. The customer can place order, edit order, cancel order and track their order through the application.

i) Discuss the quality design principles for the above case study. **(5M)**
ii) Illustrate the above case study using component level design with neat sketch. **(5M)**

Q4. A Plagiarism detector is developed that looks for any copied content over the internet if four(4) consecutive words found then online plagiarism checker will inform you the link where it is located. Now as a tester perform the integration testing to detects faults in the interaction between integrated units. Discuss various types of integration testing with diagrams. **(10M)**

Q5. An application is developed to calculate premium amount for your health insurance of your family. Enter age of your family members and it can calculate the health insurance premium. How you can perform the Equivalence Partitioning, Boundary Value Analysis for the application. **(10M)**

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1	1	1, 2, 3, 9, 10	-	1	10
Q2	2	2	1, 2, 3, 4, 5, 9, 10	-	1,2	10
Q3	2	2	1, 2, 3, 4, 5, 9, 10		1	10
Q4	3	3	1, 2, 4, 5, 9, 10		1	10
Q5	3	3	1, 2, 4, 5, 9, 10		1	10

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QUESTION PAPER

Name of the Examination: FAST TRACK FALL 2023-2024 – CAT

Course Code: CSE1005

Course Title: Software Engineering

Set number: 4

Date of Exam: 04/07/2023 (AN) (B2)

Duration: 90 minutes

Total Marks: 50

Q1. Consider an Online Shopping Application Project. Identify the Optimal Process Flow for the application and give a detailed analysis of the task set defined for the requirement Gathering

Requirements gathering might look

1. Make a list of stakeholders for the project. (2.5M)

2. Each stakeholder may make a list of features and functions required. (2.5M)

3. Discuss requirements and build a final list. (2.5M)

4. Prioritize requirements. (2.5M)

Q2. Provide one example for the Software project that would be amenable to the Unified process and explain the same with the help of use case diagrams. (10 M)

Q3. Give a detailed translation of Analysis Model to the design Model by considering the Process and abstraction dimensions. Explain it in detail (10 M)

Q4: The goal of testing is to find errors, and a good test is one that has a high probability of finding an error. Can you specify the set of Testing characteristics that achieve the goal of finding the most errors with a minimum of effort and explain with some examples. (10 M)

Q5: Assume that an organization is currently developing with an application "Billing Management System". Can you narrate who is responsible for "Are we building a right product" testing activity for this application and also list the set of tasks involved. (10 M)

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1	1	1, 2, 3, 9, 10	-	1	10
Q2	2	2	1, 2, 3, 4, 5, 9, 10	-	1,2	10
Q3	2	2	1, 2, 3, 4, 5, 9, 10		1	10
Q4	3	3	1, 2, 4, 5, 9, 10		1	10
Q5	3	3	1, 2, 4, 5, 9, 10		1	10

QUESTION PAPER

Name of the Examination: Fall Semester (2023-24) – CAT-1

Course Code: CSE 1005

Course Title: Software Engineering

Set number: 2

Date of Exam: 11/09/2023 (FN) (B₁)

Duration: 90min

Total Marks: 50Marks

Instructions:

1. Assume data wherever necessary.
2. Any assumptions made should be clearly stated.

1. Prepare a Requirement Specification Document for the Hospital Management System with the Purpose, Scope, intended audience, Modules required etc.,   (10M)

2. As a team lead for a software development project, and your team is following Agile methodologies. During a sprint planning meeting, one of your team members expresses concerns about the scope of user stories assigned for the upcoming sprint. They believe that there might be too many stories to complete within the sprint's time frame.   (10M)

3. "Particularly useful when staffing is unavailable for a complete implementation by the business deadline". The above narration is well suited for a process model for software development.   (10M)
   i) Identify the model and explain with a neat sketch.
   ii) Give an example, that clearly demonstrates the working principle of the model.

4. What are the advantages and disadvantages of developing software in which quality is "good enough"? That is, what happens when we emphasize development speed over product quality?   (10M)

5. For an online attendance management system with student, employee, and admin as actors, design a state chart diagram and activity diagram to model the dynamic aspects of a system   (10M)

QP MAPPING

Q. No.	Module Number	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped	Marks
Q1	1	1	1,2,3,4	2	1,2,3,4	10
Q2	1	1	2	1,2,3	1	10
Q3	2	4	4,9,10	2	4,9,10	10
Q4	2	3	1,2,4	1	1,2,4	10
Q5	2	3	1,2,4,5	4	1,2,4,5	10