SARVAJANIK UNIVERSITY

Sarvajanik College of Engineering and Technology

Bachelor of Technology

Computer Engineering Department

B.Tech. IV, Sem. VII CA1 EXAMINATION

Subject : Software Engineering

Subject Code: BTCO13702

Date: 11/09/2024

Time: 1 Hour 15 Minutes

Total Marks: 25

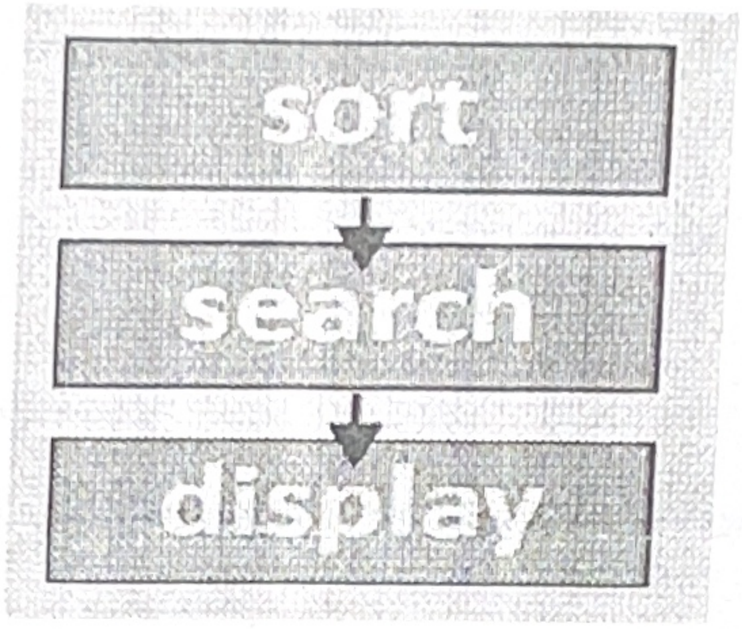
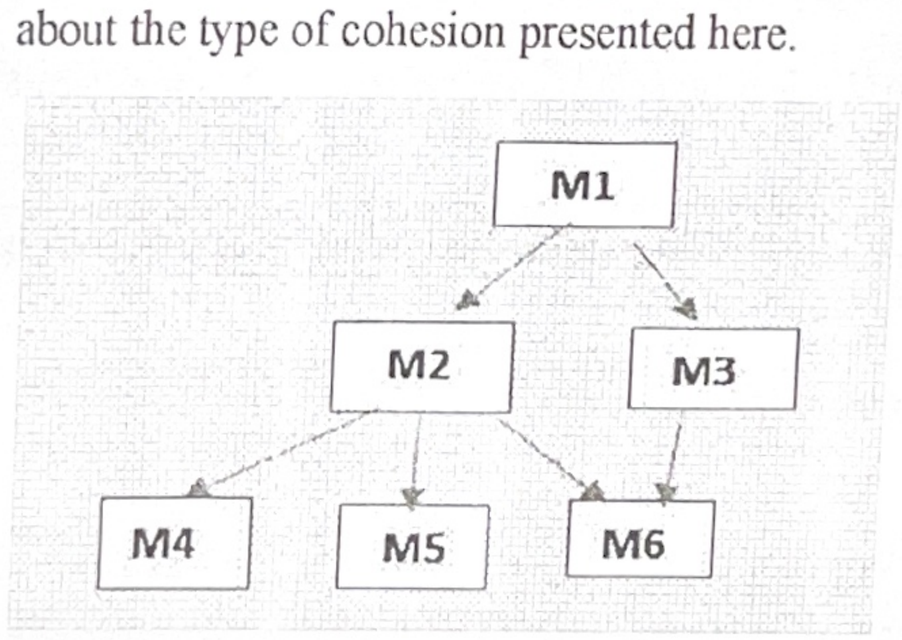
Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Course Outcomes:

Sr. No.	CO statement
CO-1	Describe the knowledge of basic Software Engineering and Process Models
CO-2	Illustrate various software requirements using the SRS documents and UML Diagrams.
CO-3	Discuss the role of project management including planning, scheduling, risk management, quality control.
CO-4	Demonstrate software design principles using Function oriented design and object-oriented design.
CO-5	Examine coding standards as well as software testing techniques and strategies.
CO-6	Demonstrate the concepts of software maintenance, configuration, recent trends in software engineering.

Cognitive Level (CL): R: Remembrance; **U:** Understanding; **Ap:** Application, **Ay:** Analyze and **E:** Evaluate **C:** Create and above Levels

Q. No		Question	Marks	Mapping with CO	CL
Q:1	(A)	Create Use Case Diagram for a given scenario for a medical clinic. "A patient calls the clinic to make an appointment for a yearly checkup. The scheduler finds the nearest empty time slot in the appointment book and schedules the appointment for that time slot. The doctor prescribes medicine to the patient. The Patient Pays Bill to the Clerk"	(03)	CO-2	C
	(B)	**Attempt any 2 out of 3 (4 marks each)**	(08)		
	1.	Generate the Data Flow Diagram for RMS (Root Mean Square) calculating software upto level 1.		CO-4	C
	2.	 Check which kind of Cohesion is there among the above modules (sort(), search(), display())? Write a description about the type of cohesion presented here.		CO-4	E
	3.	 (i) Check and write what is the number of Fan-in and Fan-out for each module represented here. (ii) Is high Fan-in Considered to be good or bad?		CO-4	E

	(C)	Formulate the following for the online Railway Reservation System. (i) Functional Requirements (ii) Non-functional Requirements (iii) Constraints	(04)	CO-2	Ay
		OR			
	(C)	Examine various steps of Requirement Engineering and write in detail.	(04)	CO-2	Ay
Q:2	(A)	Examine the Software Process Flow with a short description..	(02)	CO-1	E
	(B)	**Attempt any 2 out of 4 (4 marks each)**	(08)		
	1.	Compare RAD (Rapid Application Development) and Prototype model of software process models in detail. Support your comparison with appropriate diagrams.		CO-1	Ay
	2.	Analyse Agile Process Models and describe the Scrum framework in detail.		CO-1	Ay
	3.	Analyse the Agile Methodology. Compare its pros and cons.		CO-1	Ay
	4.	Differentiate the phases of the Waterfall Model. Distinguish each phase along with its types.		CO-1	Ay

Enrolment No._____

Sarvajanik University

W-2024 Date: 20-11-24 Time: 10:00 AM to 12:30 PM

Regular Exam

B.Tech - SEMESTER– VII EXAMINATION

35

Total Marks: 60

Course Code: BTCO13702

Course Name: Software Engineering

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			Marks
Q.1	(a)	Choose the correct options for the following.	02 0
9/12		(i) Which of the following life cycle model can be chosen if the development team has less experience on similar projects? a) Spiral b) Waterfall c) RAD d) Iterative Enhancement Model	
		(ii) Which two models doesn't allow defining requirements early in the cycle? a) Waterfall & RAD b) Prototyping & Spiral c) Prototyping & RAD d) Waterfall & Spiral	
	(b)	Explain Prototype model in detail with a diagram, advantages and disadvantages.	04 3
	(c)	Explain Extreme Programming of Agile Process Models.	06 6
Q.2	(a)	Present,what do you mean by debugging? Enlist various debugging approaches.	02 1
4/12	(b)	Explain Unit Testing in Detail.	04 3
	(c)	For the given piece of code,perform the following for basis path testing. (i)Draw the control flow graph. (ii)Calculate cyclomatic complexity using various methods. (iii)Determine linearly independent paths.	06 0

```
1:    WHILE NOT EOF LOOP
2:      Read Record;
2:      IF field1 equals 0 THEN
3:      Add field1 to Total
3:      Increment Counter
4:    ELSE
4:      IF field2 equals 0 THEN
```

```
5:          Print Total, Counter
5:          Reset Counter
6:        ELSE
6:          Subtract field2 from Total
7:        END IF
8:      END IF
8:      Print "End Record"
9:    END LOOP
9:    Print Counter
```

OR

(c) For the given piece of code, perform the following for basis path testing. 06
(i) Draw the control flow graph.
(ii) Calculate cyclomatic complexity using various methods.
(iii) Determine linearly independent paths.

```
Function fn_delete_element (int value, int array_size, int array[])
{
    1 int i;
    location = array_size + 1;

    2 for i = 1 to array_size
    3 if ( array[i] == value )
    4       location = i; end if;
      end for;

    5 for i = location to array_size
    6       array[i] = array[i+1]; end for;
    7 array_size --;
}
```

Q.3 (a) Differentiate between GANTT chart and PERT chart. 02
(b) Explain Version Control and Change Control in detail. 04
(c) What do you mean by reviews in Software Quality Assurance? Explain in detail. 06

OR

Q.3 (a) What do you mean by Component based software engineering? 02
(b) Explain the COCOMO model in detail. 04
(c) What is the Capability Maturity Model(CMM) for Software Quality Assurance? 06

Q.4 (a) Illustrate various structural and behavioral UML Diagrams? 02
(b) Examine and write functional requirements for the Restaurant Management Systems. 04

Enrolment No._____

(c) Draw a class diagram and state diagram for the Restaurant Management System. 06

OR

Q.4 (a) Illustrate an example of inconsistent requirements. 02

(b) Examine,what do you mean by non-functional requirements and Constraints? Give examples. 04

(c) Draw a use case diagram and a sequence diagram for a Vending Machine. 06

Q.5 (a) Illustrate various kinds of software maintenance? 02

(b) Evaluate which kind of cohesion is represented in below mentioned code? Justify your answer.

```
Module AAA{
Print-inventory();
Register-Student();
Issue-Book();
};
```

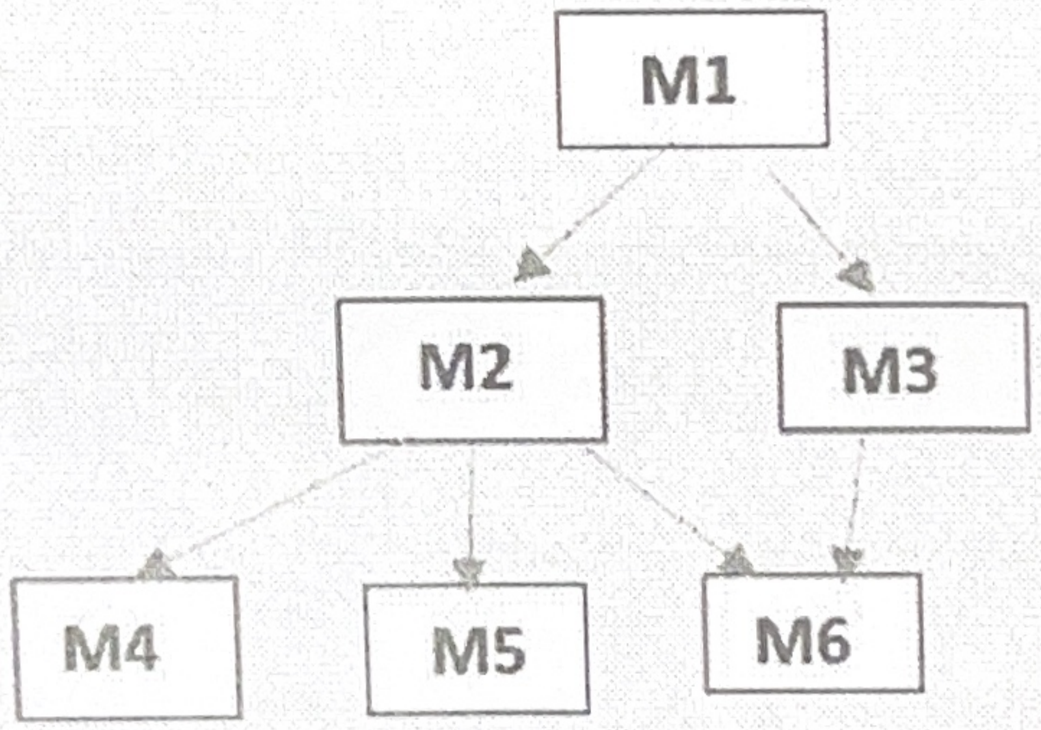
04

(c) Create Context Diagram (Level-0) and Level-1 Data Flow Diagram (DFD) for Root Mean Square(RMS) calculating Software. 06

OR

Q.5 (a) Elaborate Reverse Engineering in brief. 02

(b) (i) Is high Fan-in and low Fan-out considered good? Justify your answer. 04
(ii) Check and write what is the number of Fan-in and Fan-out for each module represented here.



(c) Create Structure Chart for Root Mean Square (RMS) calculating Software. 06