

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Computer Science & Engineering
B. Tech CSE 6th Semester (Minor 2 Examination) 2024

Entry No: 216C4217

Date: 16th April 2024 (12 to 1 PM)

Course Title: Software Engineering

Total Number of Pages:[2]

Total Number of Questions: [5]

Course Code: CSL 3091

Max Marks: [20]

Time Allowed: 1 hour

Note: Make suitable assumptions wherever required and List them in your answer.

Section - A

Q1. Note: Only Short Answers

- (a) Suppose a project requires 100 PM effort to complete, what would be a reasonable estimate about time (Months) and people to be allocated? [1] [CO3]
- (b) How is a DFD created at Requirements Analysis phase different from a DFD created at Design phase (for Function Oriented Design)? [1] [CO3]
- (c) Which Architecture Style is the de-facto in Industry? What is its purpose? [1] [CO4]
- (d) What is Open-Close Principle? [1] [CO4]

Q2. Note: Only Short Answers

- (a) Briefly discuss the ATAM method of architecture analysis. [2] [CO4]
- (b) Suppose you are required to use the existing modules (well tested) already available in the repository (from previous projects) in an organization. Which design Strategy (top-Down/bottom-Up) would you follow and why?

Section - B

Q3. For a software system: there will be four major modules: Data entry, Data update, Query, and Report generator. This project is in the organic category ($a=3.2$, $b=1.05$) as per the COCOMO model. The sizes for the different modules are estimated to be: Data Entry 0.8 KLOC; Data Update 0.8 KLOC; Query 0.8 KLOC; Reports 1.6 KLOC. The ratings of the different cost driver attributes along with their multiplying factors are: Complexity: 1.15; Storage: 1.06; Experience: 1.13; Programmer Capability: 1.17. Assume all other factors to have a nominal rating. Phase-wise distribution of effort for organic software is:

Phase	Small (2 KLOC)	Medium (8KLOC)
Product design	16	16
Detailed design	26	25
Code and unit test	42	40
Integration and test	16	19

Calculate the effort required for each phase.

Q4. What is Risk Management? What are the risk management activities? How are risks prioritized? Discuss top risk items (any 1) along with their risk analysis. [4] [CO3]

	mitigation plan.		
Q5.	<p>a. Briefly highlight the difference between the Procedural, Communicational and Sequential cohesion among modules. Which one among these would be the most desirable Cohesion?</p> <p>b. From the Cohesion and Coupling perspective what should be the guiding principle for using Inheritance?</p>	[4]	[CO4]

CO	Questions Mapping	Total Marks	Total Number of Students (to be appeared in Exam)
CO1			108
CO2			108
CO3	Q1, Q3, Q4	2+4+4	108
CO4	Q1, Q2, Q5	2+4+4	108
CO5			108

Course Outcomes:

1. Understand lifecycle processes and agile approaches of software Development.
2. Apply novel software models and techniques to bring out innovative and solutions for the growth of the society.
3. Model and Analyze structure and behavior of a software system.
4. Design a solution to a given problem and evaluate the same in various scenarios.
5. Use efficient (benchmarks, best practices, coding standards, testing) software development approaches for service of technical as well as common society needs.

SIRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Computer Science & Engineering

B. Tech. (CSE) Major Examination (Even Semester) 2023-24

Entry No: **2 | 1 | B | C | S | U | 1 | 9 |**

Total Number of Pages: [2]

Date: 20th May 2024

Total Number of Questions: [6]

Course Title: Software Engineering

Course Code: CSL 3091

Time Allowed: 3 hours (9:30 to 12:30)

Max Marks: [50]

Section – A (Short Answers Only)

Q1.	<p>a. What is Software Engineering Lite? b. Briefly explain the ETVX approach for process specification. c. Briefly explain the "Pair Programming" for Agile Software Development. d. How is the Inspection process performed? e. Briefly discuss the Team Structure. f. Briefly discuss the SCM plan. g. What is Gold Plating in Risk Management? h. What should be reasonable schedule for a project of around 150 PM effort? i. What are the desired levels of cohesion and coupling in a project? j. What is open close principle?</p>	[1x10=10]

Section – B

Q2.	<p>For a software system: there will be five major modules: A, B, C, D & E This project is in the Embedded category ($a=2.8$, $b=1.02$) as per the COCOMO model. The sizes for the different modules are estimated as: Module A: 3 KLOC; Module B: 3 KLOC; Module C: 3 KLOC; Module D: 3 KLOC, Module E: 3 KLOC.</p>	[8]

The ratings of the different cost driver attributes along with their multiplying factors are:
Complexity: 1.15; Storage: 1.06; Experience: 1.13; Programmer Capability: 1.17.
Assume all other factors to have a nominal rating.

Phase-wise distribution of effort for organic software is:

Size

Phase	Intermediate (8 KLOC)	Medium (32 KLOC)
Product design	16	16
Detailed design	25	24
Code and unit test	40	38
Integration and test	19	22

Calculate the effort required for each phase.

Q3.	<p>a. What is the need for a high quality SRS document? b. The Student Registration system for a university is required to be created using Function Oriented Modeling Approach. You are required to work at the Design phase of this project, and your task is to Design a DFD that does student</p>	[2+6=8]

	<p>registration for a semester, in a University system.</p> <p>Note: Make sure all arrows are marked with data flows. And don't try to show Flow of Control in your DFD.</p>	
Q4.	<ul style="list-style-type: none"> a. What is Equivalence class partitioning ? b. What is Alpha & Beta Testing? c. What is Smoke Testing? d. What is Stress testing? 	[2x4=8]
Q5.	<ul style="list-style-type: none"> a. What is Interaction Coupling? b. What is Component Coupling? c. What is Inheritance Coupling? d. What are Method Cohesion and Class Cohesion? 	[2x4=8]
Q6.	<p>What are the different architectural views? Which one is the de-facto industry standard?</p> <p>Which architectural view is required for the Design phase? Briefly explain different architectural styles for C & C view.</p>	[8]

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Computer Science & Engineering
B. Tech CSE 6th Semester (Minor I Examination) 2024

Entry No: **2 | 1 | 8 | C | S | O | 1 | 7 |**

Total Number of Pages: [2]

Date: 28th Feb 2024 (12 to 1 PM)

Total Number of Questions: [5]

Course Title: Software Engineering

Course Code: CSL 3091

Time Allowed: 1 hour

Max Marks: [20]

Note: Make suitable assumptions wherever required and List them in your answer.

Section - A			
Q1.	<p>Note: Only Short Answers</p> <p>(a) Briefly explain the factors responsible for low productivity (LOC per person-month) while developing an Industrial Strength Software as compared to Student software for a given problem. [1]</p> <p>(b) What is software maintenance? Suppose an organization wants to add new features to software during maintenance, what type of maintenance is this? [1] [CO1]</p> <p>(c) You are required to do the inspection of Software Design Document. What is the focus of this inspection process? Who shall be doing in the inspection process and Why? [1]</p> <p>(d) Briefly highlight the names of processes which are integrated in an organization at Level 3 of CMM (model). [1]</p> <p>(e) How can Function Points be converted into the size estimation of a software project? [1]</p>		
Q2.	<p>Note: Only Short Answers</p> <p>(a) What are the challenges faced by Software Engineering domain? [2]</p> <p>(b) What are the tasks undertaken by Project Management process? How is Project Management Plan put into practice during the complete life cycle of software development? [2] [CO1]</p> <p>(c) What is Software Engineering Lite? How is it different from the traditional software engineering (List 4 differences in their philosophy) [2]</p>		
Section - B			
Q3.	<p>Briefly explain the following in the context of XP model of Agile Software development:</p> <ol style="list-style-type: none"> 1. User stories and their prioritization 2. CRC Cards 3. Refactoring 	[3]	[CO2]
Q4.	<p>You are required to build and release a software product in versions and the development is likely to last 3 years. The versions shall be released every 2 months. The requirements are not very clear during the initial phase. The requirements may further change during the development of product, as well as after a version is release.</p>	[3]	[CO2]

	<ol style="list-style-type: none"> 1. Can you apply Waterfall model of Software Model in this context? Why? 2. Which traditional Software Engineering model(s) can be applied in this scenario and why? List your assumptions in the support of your answer. 3. Can you apply an Agile Software Development Model in this context? 		
Q5.	Create a DFD for a system which issues books from the SMVDU library. You are also required to create Data Dictionary for the labels used in Data flows.	[3]	[CO3]

CO	Questions Mapping	Total Marks	Total Number of Students (to be appeared in Exam)
CO1	Q1, Q2	11	108
CO2	Q4	6	108
CO3	Q3	3	108
CO4			108
CO5			108

Course Outcomes:

1. Understand lifecycle processes and agile approaches of software Development.
2. Apply novel software models and techniques to bring out innovative and solutions for the growth of the society.
3. Model and Analyze structure and behavior of a software system.
4. Design a solution to a given problem and evaluate the same in various scenarios.
5. Use efficient (benchmarks, best practices, coding standards, testing) software development approaches for service of technical as well as common society needs.

Total number of pages: [2]

Time allowed: 1 ½ Hrs

Date: 20-4-2022

Total number of questions: 05

Max Marks: 30

Time: 11:30 AM – 1:00 PM

Important Instructions:

- All questions are compulsory
- Assume any missing data

PART A

Q. 1. Short-Answer Questions:

[5 x 1=5 Marks]

(a) Which of the following projects would be a good one for adopting the prototyping paradigm for software development?

- 1) Accounting System
- 2) Spreadsheet
- 3) Automobile Cruise Control
- 4) Tic-Tac-Toe

(b) The software engineering methods and tools used, depends on the following EXCEPT:

- 1) The type of application being developed
- 2) The requirements of the customer
- 3) The programming language to be used to develop the software
- 4) The background of the development team
- 5) Software Engineering methods and tools depends on all of the above.

(c) What is the need of software engineering?

- 1) Requirements Definition, Design Representation, Knowledge Capture and Quality Factors
- 2) Maintaining Configurations, Organizing Teams, Channeling Creativity and Planning Resource Use
- 3) Time/Space Tradeoffs, Optimizing Process, Minimizing Communication and Problem Decomposition
- 4) Managing Complexity, Managing Personnel Resources, Managing Time and Money and Producing Useful and trustworthy Products

(d) What are the major activities of the spiral model of software engineering?

- 1) Planning, Risk Analysis, Engineering, Customer Evaluation
- 2) Defining, Prototyping, Testing, Delivery
- 3) Requirements, Design and development, Testing, Implementation
- 4) Quick Design, Build Prototype, Evaluate Prototype, Refine Prototype

(e) Which of the following are the essential attributes of a good software?

- I. reliable, secured and safe
- II. efficiency in terms of responsiveness, processing time, memory utilisation
- III. usable and compatible with other systems
- IV. must be able to meet the changing needs of customers
 - a) Only I
 - b) Only III and IV
 - c) Only I, II and IV
 - d) All are essential
 - e) None

PART B

[5 * 2 = 10 Marks]

Q.2 Answer the following:

- (a) The process of developing a software product using software engineering principles and methods is referred to as _____.
- (b) A _____ specifies a method of software development, and, _____ is the outcome of the software project.
- (c) Explain what should be your ethical responsibilities as a software engineer?
- (d) Explain why Reuse-oriented model is not always worked as a practice in its true form?
- (e) State why waterfall model is a preferred approach in situations like, Development of Department of Defense (DOD), military and aircraft programs?

PART C

Answer the following in detail

[3 * 5 = 15 Marks]

- Q. 1.** State the difference between plan-driven and agile processes. Today's software business including Siemens is strongly focusing on iterative and "agile" processes. Explain the importance of "Agile" processes. Also discuss the process issues related to agility. [5]

OR

What is software? What is legacy software? Explain in detail the different types of application software.

- Q. 2.** Propose the most appropriate generic software process model that might be used as a basis for the development of the following systems. **Give reasons for your answers.** [5]

- a) XYZ has opened a Library and wants to get a web site developed from you of the library for quickly spreading the awareness about the library among people.
- b) A shopping web site featuring an order processing system.

- Q. 3.** a) "Quality of any software system produced is governed by the quality of the process used to produce it". Do you agree with the statement? State your reasons in detail with examples. [2.5]

- b) State the significance of software management process. Explain the stages of software management process. [2.5]

Entry No:

1	9	B	C	S	O	2	8
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SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA

Major Exam (Even Semester) – 2021-22

B.Tech || CSE || Sem VI

Software Engineering

Subject Code: CSL 3091

Total number of pages: [4]

Time allowed: 3 Hrs

Date: 27-6-2022

Total number of questions: 07

Max Marks: 50

Time: 9:30 AM – 12:30 PM

Important Instructions:

- All questions are compulsory
- Assume any missing data

PART A

Q. 1. Short-Answer Questions:

[5 x 1=5 Marks]

(a) Which of the following statements characterize use cases?

- I. Use cases are suitable for modelling interfaces between two systems
 - II. Use cases are derived from the clients' requests
 - III. Use cases specify the functionalities and the behaviour
 - IV. Use cases specify the procedural process within a system
- 1) All of the above
 - 2) Only I and II
 - 3) Only II and III
 - 4) Only III and IV
 - 5) Only I and IV

(b) What does ISO stand for?

- 1) the Internal Standards Option
- 2) the International Organization for Standardization
- 3) the International Standards Opportunity
- 4) the Internal Systems Organization

(c) Which of the following is NOT the property of the legacy software?

- 1) An older software that is still supported with feature updates but no security patches
 - 2) The software's platform is incompatible with new systems and drivers
 - 3) The software that is not in compliant with recent standards
 - 4) The software that requires new updates to be functional.
- 5) All are the properties of Legacy Software

(d) What of the following stages of the software Inspection Process are in correct order?

- 1) Planning, Preparation, Overview meeting, Inspection meeting, Rework, Follow-up
- 2) Planning, Preparation, Inspection meeting, Rework, Overview meeting, Follow-up
- 3) Planning, Overview meeting, Preparation, Inspection meeting, Rework, Follow-up
- 4) Planning, Inspection meeting, Rework, Overview meeting, Preparation, Follow-up

(e) Which of the following are the critical issues that affect the development of good software?

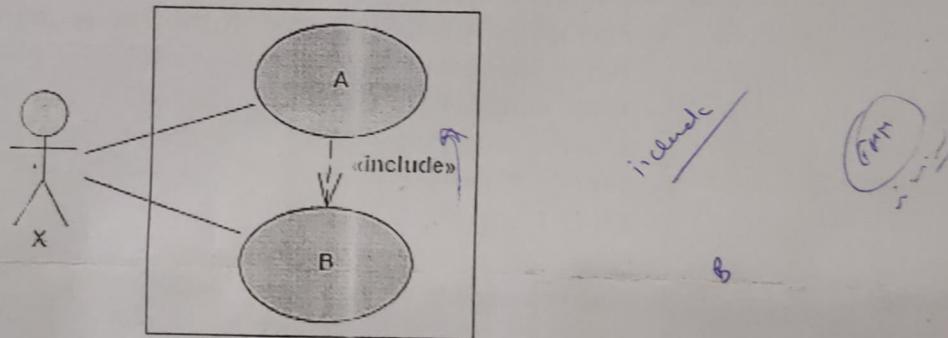
- I. Requirement to operate as distributed systems across networks
 - II. Rapid advancements in technologies
 - III. Requirement of providing security and building customer's trust in the product
 - IV. Need to change existing software and to rapidly develop new software because of business and social changes
- a) Only I
 - b) Only I, II and III
 - c) Only II and IV
 - d) All are critical issues
 - e) None

PART B

Q.2 Answer the following:

[10 * 2 = 20 Marks]

(a) Based on the following <<include>>-relationship, State which all of the following statements are true?



- 1) The behavior of B always has to be inserted into the behavior of A
- 2) The behavior of B might or might not be inserted into the behavior of A
- 3) A cannot be executed without B.
- 4) The behavior of A might or might not be inserted into the behavior of B.
- 5) A might or might not invoke use case B
- 6) B can be executed instead of A.
- 7) The behavior of A always has to be inserted into the behavior of B
- 8) B cannot be executed without A.

(b) State the purpose of the following CASE tools:

- 1) Bugzilla
- 2) Adobe Edge Inspect
- 3) Eclipse
- 4) Git

(c) Explain what is Capability Maturity Model (CMM)? Briefly explain the methods used for evaluating CMM.

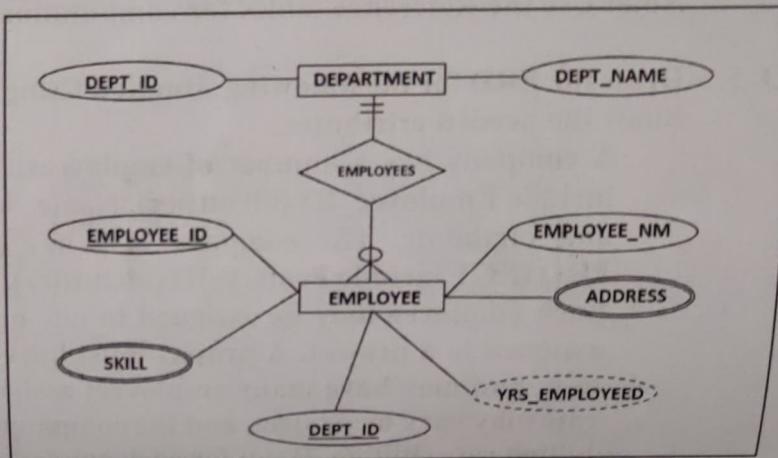
(d) Briefly explain various parameters of "Quality" associated with a Software product.

(e) Draw the Context level DFD for the following case, here EE refers to External entity, DF refers to Data Flow and P refers to Process:

A student (EE) sends in an application form (DF) containing their personal details, and their desired course. The university checks (P) that the course is available. If the course is available the student is enrolled (P) in the course, and the university confirms (P) the enrolment by sending a confirmation letter (DF) that they are registered for the course to the student. Or if the course is unavailable the student is sent a rejection letter (DF)

(f) Refer to the ERD below to answer the following questions:

- 1) List the derived attribute(s)?
- 2) List the foreign key(s).
- 3) What type of relationship is this ERD showing?
- 4) List the primary key(s).



(g) State the purpose of ISO 9000 standards. State in brief various ISO 9000 standards and the type of industries that they apply to.

(h) Draw a neat diagram showing the Requirement engineering process. Clearly state the outcome of each sub-process of Requirement engineering process in the diagram.

(i) State the steps involved in conducting the Cost-Benefit Analysis.

(j) In case the working model of any system does not exists then explain how the system analyst should perform the requirement elicitation process.

PART C

Answer the following in detail

[25 Marks]

Q.3. State the difference between any two of the following:

- i) Software process activities vs Software process description
- ii) Alpha Testing vs Beta Testing
- iii) Using line of code vs Using Function Points as a unit of sizing of software [4]
- iv) White box Testing vs Black box Testing

900⁰ ?

- Q. 4. a) Calculate using COCOMO model: i) Effort ii) Project duration iii) Average staff size, if estimated size of project is 600 KLOC using embeded mode.

OR

[5]

- b) Given the following values, compute function point when all complexity adjustment factor (CAF) are essential and weighting factors are complex. (Show Step wise calculations)

User Input = 35

User Output = 30

User Inquiries = 25

User Files = 7

External Interface = 3

Note: Use the Reference tables for computations

- Q. 5. Draw the ERD for the following situation Using the Crow's Foot notation icons. Show the needed attributes.

A company has a number of employees. The attributes of EMPLOYEE include Employee_ID (identifier), Name, Address (A composite attribute), and birthdate. The company also has several projects. Attributes of PROJECT include Project_ID (identifier), Project_name, and Start_Date. Each employee may be assigned to one or more projects, or may not be assigned to a project. A project must have at least one employee assigned to it, and may have many employees assigned to it. An employee's billing rate may vary by project, and the company wishes to record the applicable billing rate (Billing_Rate) for each employee when assigned to a particular project.



- Q. 6 In the prototype SDLC model, the user/customer plays an important role. Explain the role of the customer in building Prototype model? Explain the difference between Rapid Throwaway Prototyping and Evolutionary Prototyping. Show diagrammatically the difference between the process involved in both the cases when customer accepts or rejects the initial prototype of the system.

[5]



- Q. 7. State which type of testing is performed when the functionality of the software is not known. Explain in detail the various methods of performing such testing.

[6]

For Reference:

Tables:

Function Units	Simple/ Low	Medium/ Avg	Complex/ High
EI	3	4	6
EO	4	5	7
EQ	3	4	6
ILF	7	10	15
EIF	5	7	10

Software Projects	a	b	c	d
Organic	2.4	1.05	2.5	0.38
Semi Detached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Computer Science & Engineering

B. Tech. (CSE) Minor 1 Examination (Even Semester) 2022-23

Entry No: **20BCS057**
 Date: 22nd Feb 2023

Total Number of Pages: [1]
 Total Number of Questions: [5]

Course Title: Software Engineering
 Course Code: CSL 3091

Time Allowed: 1 hr 30 min (11:15 to 12:45)

Max Marks: [20]

Section – A		
Q1	<p>1✓ What is a Student Software and what is an Industrial Strength Software?</p> <p>2✓ List all the factors leading to the high development cost (around 9X) of Industrial Strength Software as compared to Student Software for the same purpose.</p> <p>3✓ Why “Predictability” is important in the context of a Software Process?</p> <p>4✓ Software needs to be released in increments (say version 1.0, then 1.1 and so on). List all the Software Engineering models that can be used in this case.</p>	[1x4]
Q2	<p>In which scenarios can the Waterfall Model be used most effectively? What are the drawbacks of the Waterfall model? Which Software Engineering Models fix these drawbacks?</p>	[3]
Section – B		
Q3	<p>What is the fundamental difference between traditional Software Engineering and Agile Software Engineering? Suppose there is a large project which requires over 500 employees to be deputed for over 2 years; would you be able to use the Agile Software Development model in this scenario effectively, or would you prefer the traditional Software Engineering Model? Explain your rationale.</p>	[3]
Q4	<p>A business organization needs software to help them manage all its Business, Customers, and Employees. They also require the software to be able to do a <u>Sales Forecast</u> based on past sales data records, and they also want the software to do a Market Basket Analysis of the products frequently bought by the customers. Assume that the Software Consultancy has no prior experience in developing this kind of software. Which software development model would you suggest and Why?</p>	[4]
Q5	<p>Explain in detail the Extreme Programming Model of Agile Software Development.</p>	[6]

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Computer Science & Engineering

B. Tech. (CSE) Minor 2 Examination (Even Semester) 2022-23

Entry No:

Total Number of Pages: [1]

Date: 31st March 2023

Total Number of Questions: [5]

Course Title: Software Engineering

Course Code: CSL 3091

Time Allowed: 1 hr 30 min (9:30 to 11:00)

Max Marks: [20]

Section – A

Q1.	Briefly discuss (only Short Answers): <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Team Structuring <input checked="" type="checkbox"/> Milestone(Overall) Scheduling, Detailed (High & Low level) scheduling <input checked="" type="checkbox"/> Purpose of DFD (Level 0, Level 1, Level 2, etc.) <input checked="" type="checkbox"/> Structure of Use-Case description with an example 	[4]
Q2.	What activities are performed in Configuration Management Planning?	[2]

Section – B

Q3.	What role does the Function point calculation play in Software Size Estimation? Discuss the methodology to calculate the Function Points.	[4]																		
Q4.	What is Risk Management? What are the risk management activities? How are risks prioritized? Discuss top risk items (any 5) along with their risk mitigation plan.	[4]																		
Q5.	For a software system: there will be four major modules: Data entry, Data update, Query, and Report generator. This project is in the organic category ($a= 3.2$, $b=1.05$) as per the COCOMO model. The sizes for the different modules are estimated to be: Data Entry 0.8 KLOC ; Data Update 0.8 KLOC ; Query 0.8 KLOC ; Reports 1.6 KLOC . The ratings of the different cost driver attributes along with their multiplying factors are: Complexity: 1.15 ; Storage: 1.06 ; Experience: 1.13 ; Programmer Capability: 1.17 . Assume all other factors to have a nominal rating. Phase-wise distribution of effort for organic software is: <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Phase</th> <th colspan="2" style="text-align: center;">Size</th> </tr> <tr> <th></th> <th style="text-align: center;">Small (2 KLOC)</th> <th style="text-align: center;">Medium (8KLOC)</th> </tr> </thead> <tbody> <tr> <td>Product design</td> <td style="text-align: center;">16</td> <td style="text-align: center;">16</td> </tr> <tr> <td>Detailed design</td> <td style="text-align: center;">26</td> <td style="text-align: center;">25</td> </tr> <tr> <td>Code and unit test</td> <td style="text-align: center;">42</td> <td style="text-align: center;">40</td> </tr> <tr> <td>Integration and test</td> <td style="text-align: center;">16</td> <td style="text-align: center;">19</td> </tr> </tbody> </table> Calculate the effort required for each phase.	Phase	Size			Small (2 KLOC)	Medium (8KLOC)	Product design	16	16	Detailed design	26	25	Code and unit test	42	40	Integration and test	16	19	[6]
Phase	Size																			
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Integration and test	16	19																		

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Computer Science & Engineering

B. Tech. (CSE) Major Examination (Even Semester) 2022-23

Entry No: **20BCE057**
 Date: 10th May 2023

Total Number of Pages: [2]

Total Number of Questions: [6]

Course Title: Software Engineering
 Course Code: CSL 3091

Time Allowed: 3 hours (2 to 5 PM)

Max Marks: [50]

Section – A

Q1	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Given a research-oriented project of long duration (say 3 years). What kind of Team structure would u choose? Justify your answer. <input checked="" type="checkbox"/> Discuss any 3 drawbacks of the Water Fall model. Which models overcome these drawbacks? <input checked="" type="checkbox"/> Explain Spike solution, CRC cards, and Pair Programming in the context of the XP model (Agile). <input checked="" type="checkbox"/> Discuss the following risk items and the techniques for managing these: Gold Plating, Developing the Wrong User Interface <input checked="" type="checkbox"/> What is the need for an SRS document? <input checked="" type="checkbox"/> Briefly discuss Software Configuration Management Process. <input checked="" type="checkbox"/> What purpose does a DFD serve during the Requirement Analysis phase? How is it different from a DFD created at the Design phase in Function Oriented Design? 	[7x2] = 14]

Section – B

Q2	<p>For a software system: there will be four major modules: A, B, C, and D This project is in the organic category (a= 3.2, b=1.05) as per the COCOMO model. The sizes for the different modules are estimated to be: Module A: 1 KLOC; Module B: 1 KLOC; Module C: 1 KLOC; Module D: 2 KLOC.</p> <p>The ratings of the different cost driver attributes along with their multiplying factors are: Complexity: 1.15; Storage: 1.06; Experience: 1.13; Programmer Capability: 1.17. Assume all other factors to have a nominal rating.</p> <p>Phase-wise distribution of effort for organic software is:</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Phase</th><th style="text-align: center;">Size</th></tr> </thead> <tbody> <tr> <td style="text-align: center;">Small (2 KLOC)</td><td style="text-align: center;">Medium (8KLOC)</td></tr> </tbody> </table>	Phase	Size	Small (2 KLOC)	Medium (8KLOC)	[6]
Phase	Size					
Small (2 KLOC)	Medium (8KLOC)					

Calculate the effort required for each phase.

Q3.	Why do we need the Module View, C & C view, & the Allocation view? Briefly discuss all the architectural views. Which Software Architecture view is the de-facto standard view? Briefly discuss the Architectural Tradeoff Analysis Method.	[4]
Q4.	<p>a) What are Cohesion and Coupling and what are their desirable levels?</p> <p>b) What is the Open-Close Principle?</p> <p>c) Discuss Interaction Coupling in Object Oriented Design.</p> <p>d) In the context of Object Oriented Design, what are: Class cohesion, Method Cohesion, and Inheritance Cohesion?</p>	[2x4 = 8]
Q5.	<p>a) What is the purpose of coding best practices? Discuss a few coding best practices.</p> <p>b) What is refactoring? Why and how is it done?</p> <p>c) How are the following Debugging Strategies performed: Backtracking, Cause Elimination</p>	[3x2 = 6]
Q6.	Identify the type (Black-Box/White-Box) of each of the following Testing techniques. Also, describe their methodology briefly: <p>a) Equivalence Class Partitioning</p> <p>b) State-Based Testing</p> <p>c) Data Flow</p> <p>d) Mutation</p> <p>e) Alpha and Beta</p> <p>f) Smoke Testing</p>	[6x2 =12]

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Computer Science & Engineering

B. Tech. (CSE) Major Examination (Even Semester) 2022-23

Entry No: 20BCS108
Date: 10th May 2023

Total Number of Pages: [2]

Total Number of Questions: [6]

Course Title: Software Engineering

Course Code: CSL 3091

Time Allowed: 3 hours (2 to 5 PM)

Max Marks: [50]

Section - A

Q1.

- a. Given a research-oriented project of long duration (say 3 years). What kind of Team structure would u choose? Justify your answer. [7x2] = 14
- b. Discuss any 3 drawbacks of the Water Fall model. Which models overcome these drawbacks?
- c. Explain Spike solution, CRC cards, and Pair Programming in the context of the XP model (Agile).
- d. Discuss the following risk items and the techniques for managing these: Gold Plating, Developing the Wrong User Interface
- e. What is the need for an SRS document?
- f. Briefly discuss Software Configuration Management Process.
- g. What purpose does a LO serve during the Requirement Analysis phase? How is it different from a DFD created at the Design phase in Function Oriented Design?

Section - B

Q2

For a software system: there will be four major modules: A, B, C, and D. This project is in the organic category ($a=3.2$, $b=1.05$) as per the COCOMO model.

[6]

The sizes for the different modules are estimated to be: Module A: 1 KLOC; Module B: 1 KLOC; Module C: 1 KLOC; Module D: 2 KLOC.

The ratings of the different cost driver attributes along with their multiplying factors are:
 Complexity: 1.15; Storage: 1.06; Experience: 1.13; Programmer Capability: 1.17.
Assume all other factors to have a nominal rating.

Phase-wise distribution of effort for organic software is:

Size

Phase	Small (2 KLOC)	Medium (8KLOC)
Product design	16	16
Detailed design	26	25
Code and unit test	42	40
Integration and test	16	19

Calculate the effort required for each phase.

Q3. Why do we need the Module View, C & C view, & the Allocation view? Briefly discuss architectural views. Which Software Architecture view is the de-facto standard view? Discuss the Architectural Tradeoff Analysis Method.

Q4.

- a. What are Cohesion and Coupling and what are their desirable levels? 4
- b. What is the Open-Close Principle? 1
- c. Discuss Interaction Coupling in Object Oriented Design. 2
- d. In the context of Object Oriented Design, what are: Class cohesion, Method cohesion and Inheritance Cohesion? 3

Q5.

- a. What is the purpose of coding best practices? Discuss a few coding best practices. 3
- b. What is refactoring? Why and how is it done? 2
- c. How are the following Debugging Strategies performed: Backtracking, Call Elimination

Q6. Identify the type (Black-Box/White-Box) of each of the following Testing techniques and describe their methodology briefly:

- a. Equivalence Class Partitioning 3
- b. State-Based Testing
- c. Data Flow
- d. Mutation
- e. Alpha and Beta
- f. Smoke Testing

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Computer Science & Engineering

B. Tech. (CSE) Major Examination (Even Semester) 2023-24

Entry No:

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Total Number of Pages: [2]

Date: 20th May 2024

Total Number of Questions: [6]

Course Title: Software Engineering
 Course Code: CSL 3091

Time Allowed: 3 hours (9:30 to 12:30)

Max Marks: [50]

Section – A (Short Answers Only)

Q1.	<ul style="list-style-type: none"> a. What is Software Engineering Lite? b. Briefly explain the ETVX approach for process specification. c. Briefly explain the “Pair Programming” for Agile Software Development. d. How is the Inspection process performed? e. Briefly discuss the Team Structure. f. Briefly discuss the SCM plan. g. What is Gold Plating in Risk Management? h. What should be reasonable schedule for a project of around <u>150 PM</u> effort? i. What are the desired levels of cohesion and coupling in a project? j. What is open close principle? 	[1x10=10]
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Section – B

Q2.	<p>For a software system: there will be five major modules: A, B, C, D & E This project is in the Embedded category ($a = 2.8$, $b = 1.02$) as per the COCOMO model. The sizes for the different modules are estimated as: Module A: 3 KLOC; Module B: 3 KLOC; Module C: 3 KLOC; Module D: 3 KLOC, Module E: 3 KLOC. The ratings of the different cost driver attributes along with their multiplying factors are: Complexity: 1.15; Storage: 1.06; Experience: 1.13; Programmer Capability: 1.17. Assume all other factors to have a nominal rating.</p> <p>Phase-wise distribution of effort for organic software is:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Phase</th><th style="width: 40%;">Size</th><th style="width: 40%;"></th></tr> </thead> <tbody> <tr> <td></td><td style="text-align: center;">Intermediate (8 KLOC)</td><td style="text-align: center;">Medium (32 KLOC)</td></tr> <tr> <td>Product design</td><td style="text-align: center;">16</td><td style="text-align: center;">16</td></tr> <tr> <td>Detailed design</td><td style="text-align: center;">25</td><td style="text-align: center;">24</td></tr> <tr> <td>Code and unit test</td><td style="text-align: center;">40</td><td style="text-align: center;">38</td></tr> <tr> <td>Integration and test</td><td style="text-align: center;">19</td><td style="text-align: center;">22</td></tr> </tbody> </table> <p>Calculate the effort required for each phase.</p>	Phase	Size			Intermediate (8 KLOC)	Medium (32 KLOC)	Product design	16	16	Detailed design	25	24	Code and unit test	40	38	Integration and test	19	22	[8]
Phase	Size																			
	Intermediate (8 KLOC)	Medium (32 KLOC)																		
Product design	16	16																		
Detailed design	25	24																		
Code and unit test	40	38																		
Integration and test	19	22																		
Q3.	<ul style="list-style-type: none"> a. What is the need for a high quality SRS document? b. The Student Registration system for a university is required to be created using Function Oriented Modeling Approach. You are required to work at the Design phase of this project, and your task is to Design a DFD that does student 	[2+6=8]																		

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Computer Science & Engineering
B. Tech CSE 6th Semester (Minor 2 Examination) 2024

Entry No: **21bc5050**

Total Number of Pages: [2]

Date: 16th April 2024 (12 to 1 PM)

Total Number of Questions: [5]

Course Title: Software Engineering

Course Code: CSL 3091

Time Allowed: 1 hour

Max Marks: [20]

Note: Make suitable assumptions wherever required and List them in your answer.

Section - A				
Q1.	Note: Only Short Answers			
	(a) Suppose a project requires 100 PM effort to complete, what would be a reasonable estimate about time (Months) and people to be allocated? [1]	[1]	[CO3]	
	(b) How is a DFD created at Requirements Analysis phase different from a DFD created at Design phase (for Function Oriented Design)? [1]	[1]	[CO3]	
	(c) Which Architecture Style is the de-facto in Industry? What is its purpose? [1]	[1]	[CO4]	
	(d) What is Open-Close Principle? [1]	[1]	[CO4]	
Q2.	Note: Only Short Answers	[2]		
	(a) Briefly discuss the ATAM method of architecture analysis. [2]		[CO4]	
	(b) Suppose you are required to use the existing modules (well tested) already available in the repository (from previous projects) in an organization. Which design Strategy (top-Down/bottom-Up) would you follow and why? [2]			

Section - B																			
Q3.	For a software system: there will be four major modules: Data entry, Data update, Query, and Report generator . This project is in the organic category ($a=3.2$, $b=1.05$) as per the COCOMO model. The sizes for the different modules are estimated to be: Data Entry 0.8 KLOC; Data Update 0.8 KLOC; Query 0.8 KLOC; Reports 1.6 KLOC. The ratings of the different cost driver attributes along with their multiplying factors are: Complexity: 1.15; Storage: 1.06; Experience: 1.13; Programmer Capability: 1.17. Assume all other factors to have a nominal rating. Phase-wise distribution of effort for organic software is:	[4]	[CO3]																
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Phase</th><th style="text-align: center;">Small (2 KLOC)</th><th style="text-align: center;">Medium (8KLOC)</th></tr> </thead> <tbody> <tr> <td>Product design</td><td style="text-align: center;">16</td><td style="text-align: center;">16</td></tr> <tr> <td>Detailed design</td><td style="text-align: center;">26</td><td style="text-align: center;">25</td></tr> <tr> <td>Code and unit test</td><td style="text-align: center;">42</td><td style="text-align: center;">40</td></tr> <tr> <td>Integration and test</td><td style="text-align: center;">16</td><td style="text-align: center;">19</td></tr> </tbody> </table>	Phase	Small (2 KLOC)	Medium (8KLOC)	Product design	16	16	Detailed design	26	25	Code and unit test	42	40	Integration and test	16	19			
Phase	Small (2 KLOC)	Medium (8KLOC)																	
Product design	16	16																	
Detailed design	26	25																	
Code and unit test	42	40																	
Integration and test	16	19																	
	Calculate the effort required for each phase.																		
Q4.	What is Risk Management? What are the risk management activities? How are risks prioritized? Discuss top risk items (any 4) along with their risk	[4]	[CO3]																

	mitigation plan.		
Q5.	<p>a. Briefly highlight the difference between the Procedural, Communicational and Sequential cohesion among modules. Which one among these would be the most desirable Cohesion?</p> <p>b. From the Cohesion and Coupling perspective what should be the guiding principle for using Inheritance?</p>	[4]	[CO4]

CO	Questions Mapping	Total Marks	Total Number of Students (to be appeared in Exam)
CO1			108
CO2			108
CO3	Q1, Q3, Q4	2+4+4	108
CO4	Q1, Q2, Q5	2+4+4	108
CO5			108

Course Outcomes:

1. Understand lifecycle processes and agile approaches of software Development.
2. Apply novel software models and techniques to bring out innovative and solutions for the growth of the society.
3. Model and Analyze structure and behavior of a software system.
4. Design a solution to a given problem and evaluate the same in various scenarios.
5. Use efficient (benchmarks, best practices, coding standards, testing) software development approaches for service of technical as well as common society needs.

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Computer Science & Engineering
B. Tech CSE 6th Semester (Minor I Examination) 2024

Entry No:

Total Number of Pages: [2]

Date: 28th Feb 2024 (12 to 1 PM)

Total Number of Questions: [5]

Course Title: Software Engineering

Course Code: CSL 3091

Time Allowed: 1 hour

Max Marks: [20]

Note: Make suitable assumptions wherever required and List them in your answer.

Section - A			
Q1.	<p>Note: Only Short Answers</p> <p>(a) Briefly explain the factors responsible for low productivity (LOC per person-month) while developing an Industrial Strength Software as compared to Student software for a given problem. [1]</p> <p>(b) What is software maintenance? Suppose an organization wants to add new features to software during maintenance, what type of maintenance is this? [1] [CO1]</p> <p>(c) You are required to do the inspection of Software Design Document. What is the focus of this inspection process? Who shall be doing in the inspection process and Why? [1]</p> <p>(d) Briefly highlight the names of processes which are integrated in an organization at Level 3 of CMM (model). [1]</p> <p>(e) How can Function Points be converted into the size estimation of a software project? [1]</p>		
Q2.	<p>Note: Only Short Answers</p> <p>(a) What are the challenges faced by Software Engineering domain? [2]</p> <p>(b) What are the tasks undertaken by Project Management process? How is Project Management Plan put into practice during the complete life cycle of software development? [2] [CO1]</p> <p>(c) What is Software Engineering Lite? How is it different from the traditional software engineering (List 4 differences in their philosophy) [2]</p>		
Section - B			
Q3.	<p>Briefly explain the following in the context of XP model of Agile Software development:</p> <ol style="list-style-type: none"> 1. User stories and their prioritization 2. CRC Cards <i>increase increment</i> 3. Refactoring 	[3]	[CO2]
Q4.	<p>You are required to build and release a software product in versions and the development is likely to last 3 years. The versions shall be released every 2 months. The requirements are not very clear during the initial phase. The requirements may further change during the development of product, as well as after a version is released.</p>	[3]	[CO2]

	<ol style="list-style-type: none"> 1. Can you apply Waterfall model of Software Model in this context? Why? 2. Which traditional Software Engineering model(s) can be applied in this scenario and why? List your assumptions in the support of your answer. 3. Can you apply an Agile Software Development Model in this context? 		
Q5.	Create a DFD for a system which issues books from the SMVDU library. You are also required to create Data Dictionary for the labels used in Data flows.	[3]	[CO3]

CO	Questions Mapping	Total Marks	Total Number of Students (to be appeared in Exam)
CO1	Q1, Q2	11	108
CO2	Q4	6	108
CO3	Q3	3	108
CO4			108
CO5			108

Course Outcomes:

1. Understand lifecycle processes and agile approaches of software Development.
2. Apply novel software models and techniques to bring out innovative and solutions for the growth of the society.
3. Model and Analyze structure and behavior of a software system.
4. Design a solution to a given problem and evaluate the same in various scenarios.
5. Use efficient (benchmarks, best practices, coding standards, testing) software development approaches for service of technical as well as common society needs.