



Reg. No. :

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**Question Paper Code : X 10318**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020/  
APRIL/MAY 2021

Fourth/Fifth Semester

Computer Science and Engineering

CS 8494 – SOFTWARE ENGINEERING

(Common to Computer and Communication Engineering /Information Technology)  
(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. List out the goals of software engineering.
2. What are the various categories of software ?
3. List out the characteristics of good SRS.
4. Name any two requirement of elicitation techniques.
5. Differentiate internal and external design.
6. List out the various types of cohesion and coupling.
7. Mention the software testability checklist.
8. How black box testing is differing from white box testing ?
9. What are the processes of risk management ?
10. List out the various steps in planning process.

PART – B

(5×13=65 Marks)

11. a) Compare and contrast waterfall model, spiral model and iterative model.

(OR)

- b) Define Agile Programming. Explain the 12 practices of extreme programming.

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12. a) With suitable example explain the functional and non-functional requirements.

(OR)

b) Describe how Software requirements are documented. State the importance of documentation.

13. a) What are the different types of architectural styles exist for software and explain any software architecture in detail ?

(OR)

b) Explain the core activities involved in User Interface design process with necessary block diagram.

14. a) Explain equivalence partitioning technique with suitable example.

(OR)

b) Compare and contrast reverse engineering, forward engineering and reengineering.

15. a) Explain how effort and cost estimation are determined using cocano model.

(OR)

b) Explain the various steps involved in risk management.

**PART – C**

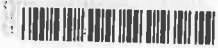
**(1×15=15 Marks)**

16. a) Assume that you are developing a online railway reservation system. Prepare the Software Requirement Specification (SRS) document for the system.

(OR)

b) For online railway reservation system, draw the Data Flow Diagram (DFD) upto level 4.

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Reg. No. :

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**Question Paper Code : 90158**

**B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019**

**Fourth/Fifth Semester**

**Computer Science and Engineering**

**CS 8494 – SOFTWARE ENGINEERING**

**(Common to : Information Technology/Computer and Communication Engineering)**

**(Regulations 2017)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions**

**PART – A**

**(10×2=20 Marks)**

1. What is a software process ?
2. Define an evolutionary prototype.
3. What are non-functional requirements ?
4. Define a Petri net.
5. What is inheritance ?
6. Define a component. Give example.
7. What is a test case ?
8. Outline the need for system testing.
9. What is budgeted cost of work scheduled ?
10. Write any two differences between “known risks” and “predictable risks”.

**PART – B**

**(5×13=65 Marks)**

11. a) Outline the spiral life cycle model with a diagram.

**(OR)**

- b) What is agility ? Elaborate the agile principles.

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12. a) i) Discuss the distinct tasks involved in requirement engineering process. (9)
- ii) What does win-win mean in the context of negotiation during the requirements engineering activity? (4)
- (OR)
- b) Draw a Petri Net that depicts the operation of an "Automated Teller Machine". State the functional requirements you are considering. (13)
13. a) What is software architecture? Outline the architectural styles with an example. (13)
- (OR)
- b) Outline the steps in designing class based components with an example. (13)
14. a) Elaborate path testing and regression testing with an example. (13)
- (OR)
- b) i) Explain how Business Process Reengineering (BPE) helps to achieve a defined business outcome. (8)
- ii) Outline how the reverse engineering process helps to improve the legacy software. (5)
15. a) Elaborate the cost estimation COCOMO II cost estimation model. (13)
- (OR)
- b) Present a detailed note on risk management. (13)
- PART – C (1×15=15 Marks)
16. a) Prepare a software requirement specification document for a "Library Management System". (15)
- (OR)
- b) Outline the steps in function point analysis with an example. (15)

Reg. No. :

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**Question Paper Code : 80101**

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Fourth Semester

Computer Science and Engineering

CS 8494 — SOFTWARE ENGINEERING

(Common to Computer and Communication Engineering)

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define: Software Engineering.
2. List any two agile process models.
3. Differentiate: Functional and Non-functional requirements.
4. State two advantages of using Petri Nets.
5. How does the Data Flow diagram help in design of software system?
6. List the levels of testing.
7. Define : Reverse Engineering.
8. List two advantages of using COCOMO model.
9. Compare: Project Risk vs Business Risk.
10. List CASE tools for the following phases of SDLC : Design, Testing.

## PART B — (5 × 13 = 65 marks)

11. (a) Compare the Waterfall, Prototyping and Spiral model. List the features of each model, advantages and disadvantages and a type of application where the model will be acceptable. (13)

Or

- (b) (i) Define Agility. List any five principles of agility. (5)  
(ii) Explain the phases in Extreme Programming process. (8)

12. (a) Develop the Software requirements document for the following requirement. A Coffee Vending Machine serves coffee to customers. A customer can choose a type of coffee among a list of options, supply the amount required and get served. Each coffee is prepared by adding units of hot water, coffee powder, milk and sugar. The recipe for each coffee is stored. (13)

Or

- (b) List any two techniques used for eliciting requirements. Compare the two techniques and list where each is applicable. (13)

13. (a) List and explain any five fundamental software design concepts. (13)

Or

- (b) (i) Define Software Architecture. (2)  
(ii) Explain and compare the following architectural styles :  
(1) Call and return architecture (4)  
(2) Object-oriented architecture (4)  
(3) Layered architecture. (3)

14. (a) (i) Compare white box and black box testing. (4)  
(ii) Write a procedure for the following: Given three sides of a triangle, return the type of triangle i.e. equilateral, isosceles and scalene triangle. Draw the Control Flow Graph and calculate cyclomatic complexity to calculate the minimum number of paths. Enumerate the paths to be tested. (9)

Or

- (b) (i) Define : Refactoring. (2)  
(ii) List the phases in software reengineering process model and explain each phase. (11)



15. (a) List the features of LOC and FP based estimation models. Compare the two models and list the advantages of one over other. (7 + 6)

Or

- (b) (i) Define: Risk. (2)  
 (ii) List the types of risk and give examples for each. (5)  
 (iii) List and explain the phases in risk management. (6)

PART C — (1 × 15 = 15 marks)

16. (a) Given the requirements for an Automated Teller Machine (ATM) system (see below), design the following :

- (i) Use case diagram. (4)  
 (ii) Activity diagram detailing each use case. (6)  
 (iii) List test cases for any one functionality from your Use Case diagram. (5)

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions.

The ATM must be able to provide the following services to the customer:

A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of \$20.00. Approval must be obtained from the bank before cash is dispensed.

A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.

A customer must be able to make a transfer of money between any two accounts linked to the card.

A customer must be able to make a balance inquiry of any account linked to the card.

Or

- (b) (i) Draw the Level 0 and Level 1 Data Flow diagram for the following system. (8)
- (ii) Identify entities in the system and draw a diagram showing the relationship between entities. (7)

The Chocolate Vending Machine (CVM) system requirements are as follows: The CVM dispenses chocolates: (1) very large chocolates (VC) at Rs. 15, (2) large chocolates (LC) at Rs. 10, and (3) a small chocolates (SC) at Rs. 5. The vending machine only deals in coins. The CVM gives the proper change after the product selection is made. The CVM must check the amount deposited by the customer. The vending machine operates in the following way. (A) The CVM remains idle until a customer or owner begins to interact with the machine. When a selection button is pressed the VCM indicates the required amount (Rs. 15/Rs. 10/Rs. 5). (B) If the full amount needed has been deposited then dispense the proper chocolate and display: Thank You!. (C) If an insufficient amount (possibly zero) has been deposited then display: remaining amount needed. (D) If an over amount has been deposited then dispense the proper candy and change and display: Thank You!.



- Reg. No. :**

**Question Paper Code : 80101**

### Fourth Semester

CS 8494 — SOFTWARE ENGINEERING

(Regulation 2017)

Maximum : 100 marks

PART A — (10 × 2 = 20 marks)

- 4

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PART B — (5 × 13 = 65 marks)

11. (a) Compare the Waterfall, Prototyping and Spiral model. List the features of each model, advantages and disadvantages and a type of application where the model will be acceptable. (13)

Or

- (b) (i) Define Agility. List any five principles of agility. (5)  
(ii) Explain the phases in Extreme Programming process. (8)

12. (a) Develop the Software requirements document for the following requirement. A Coffee Vending Machine serves coffee to customers. A customer can choose a type of coffee among a list of options, supply the amount required and get served. Each coffee is prepared by adding units of hot water, coffee powder, milk and sugar. The recipe for each coffee is stored. (13)

Or

- (b) List any two techniques used for eliciting requirements. Compare the two techniques and list where each is applicable. (13)

13. (a) List and explain any five fundamental software design concepts. (13)

Or

- (b) (i) Define Software Architecture. (2)  
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(1) Call and return architecture (4)  
(2) Object-oriented architecture (4)  
(3) Layered architecture. (3)

14. (a) (i) Compare white box and black box testing. (4)  
(ii) Write a procedure for the following: Given three sides of a triangle, return the type of triangle i.e. equilateral, isosceles and scalene triangle. Draw the Control Flow Graph and calculate cyclomatic complexity to calculate the minimum number of paths. Enumerate the paths to be tested. (9)

Or

- (b) (i) Define : Refactoring. (2)  
(ii) List the phases in software reengineering process model and explain each phase. (11)

15. (a) List the features of LOC and FP based estimation models. Compare the two models and list the advantages of one over other. (7 + 6)

Or

- (b) (i) Define: Risk. (2)  
(ii) List the types of risk and give examples for each. (5)  
(iii) List and explain the phases in risk management. (6)

PART C — (1 × 15 = 15 marks)

16. (a) Given the requirements for an Automated Teller Machine (ATM) system (see below), design the following :

- (i) Use case diagram. (4)  
(ii) Activity diagram detailing each use case. (6)  
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A customer must be able to make a transfer of money between any two accounts linked to the card.

A customer must be able to make a balance inquiry of any account linked to the card.

Or



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**Question Paper Code : 90158**

**B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019**

**Fourth/Fifth Semester**

**Computer Science and Engineering**

**CS 8494 – SOFTWARE ENGINEERING**

**(Common to : Information Technology/Computer and Communication Engineering)**

**(Regulations 2017)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions**

**PART – A**

**(10×2=20 Marks)**

1. What is a software process ?
2. Define an evolutionary prototype.
3. What are non-functional requirements ?
4. Define a Petri net.
5. What is inheritance ?
6. Define a component. Give example.
7. What is a test case ?
8. Outline the need for system testing.
9. What is budgeted cost of work scheduled ?
10. Write any two differences between “known risks” and “predictable risks”.

**PART – B**

**(5×13=65 Marks)**

11. a) Outline the spiral life cycle model with a diagram.

**(OR)**

- b) What is agility ? Elaborate the agile principles.



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12. a) i) Discuss the distinct tasks involved in requirement engineering process. (9)  
ii) What does win-win mean in the context of negotiation during the requirements engineering activity? (4)

(OR)

- b) Draw a Petri Net that depicts the operation of an "Automated Teller Machine". State the functional requirements you are considering. (13)
13. a) What is software architecture? Outline the architectural styles with an example. (13)
- b) Outline the steps in designing class based components with an example. (13)
14. a) Elaborate path testing and regression testing with an example. (13)

(OR)

- b) i) Explain how Business Process Reengineering (BPE) helps to achieve a defined business outcome. (8)  
ii) Outline how the reverse engineering process helps to improve the legacy software. (5)
15. a) Elaborate the cost estimation COCOMO II cost estimation model. (13)
- (OR)
- b) Present a detailed note on risk management. (13)

PART – C

(1×15=15 Marks)

16. a) Prepare a software requirement specification document for a "Library Management System". (15)
- (OR)
- b) Outline the steps in function point analysis with an example. (15)
-

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**Question Paper Code : 57250**

25/05/16

FN

**B.E/B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016**

#### Fourth Semester

Computer Science and Engineering

CS 6403 – SOFTWARE ENGINEERING

(Common to Information Technologies)

(Regulations 2013)

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions.**

**PART – A (10 × 2 = 20 Marks)**

1. What led to the transition from product oriented development to process oriented development ?
2. Mention the characteristics of software contrasting it with characteristics of hardware.
3. List the characteristics of a good SRS.
4. What are the linkages between data flow and E-R Diagram ?
5. If a module has logical cohesion, what kind of coupling is this module likely to have ?
6. What is the need for architectural mapping using data flow ?
7. How can refactoring be made more effective ?
8. Why does software fail after it has passed from acceptance testing ?
9. List a few process and project metrics.
10. Will exhaustive testing guarantee that the program is 100% correct ?

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**PART – B (5 × 16 = 80 Marks)**

11. (a) (i) Discuss the prototyping model. What is the effect of designing a prototype on the overall cost of the software project ? (8)
- (ii) Describe the type of situations where iterative enhancement model might lead to difficulties. (8)

**OR**

- (b) (i) Elucidate the key features of the software process models with suitable examples. (8)
- (ii) What is the role of user participation in the selection of a life cycle model? (8)

12. (a) (i) Explain the organization of SRS and highlight the importance of each subsection. (8)
- (ii) Requirements analysis is unquestionably the most communication intensive step in the software engineering process. Why does the communication path frequently breaks down? (8)

**OR**

- (b) (i) Differentiate between user and system requirements. (4)  
(ii) Describe the requirements change management process in detail. (12)

13. (a) Write short notes on the following. (4 × 4 = 16)
- (i) Design heuristics
  - (ii) User-interface design
  - (iii) Component level design
  - (iv) Data/Class design

OR

- (b) (i) What is modularity ? State its importance and explain coupling and cohesion. (8)
- (ii) Discuss the differences between Object Oriented and Function Oriented Design. (8)

14. (a) (i) State the need for refactoring. How can a development model benefit by the use of refactoring? (8)
- (ii) Why does software testing need extensive planning? Explain. (8)

OR

- (b) (i) Compare and contrast alpha and beta testing. (8)

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- (ii) Consider a program for determining the previous date. Its input is a triple of day, month and year with the values in the range  $1 \leq \text{month} \leq 12$ ,  $1 \leq \text{day} \leq 31$ ,  $1990 \leq \text{year} \leq 2014$ . The possible outputs would be previous date or invalid input date. Design the boundary value test cases. (8)

15. (a) Write short notes on the following : (2 × 8 = 16)
- (i) Make/Buy decision
- (ii) COCOMO II

OR

- (b) (i) An application has the following: 10 low external inputs, 8 high external outputs, 13 low internal logical files, 17 high external interface files, 11 average external inquiries and complexity adjustment factor of 1.10. What are the unadjusted and adjusted function point counts? (4)
- (ii) Discuss Putnam resources allocation model. Derive the time and effort equations. (12)

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Reg. No. :

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11/05/18

(FN)

**Question Paper Code : 40907**

**B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018**  
**Fourth Semester**  
**Computer Science and Engineering**  
**CS6403 – SOFTWARE ENGINEERING**  
**(Regulations 2013)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions**

**PART – A**

**(10×2=20 Marks)**

1. What is Software ? List its characteristics.
2. If you have to develop a word processing software product, what process model will you choose ? Justify your answer.
3. What are the various types of traceability in software engineering ?
4. Compare prototyping approaches in a software process.
5. List the principles of software design.
6. What UI design patterns are used for the following ?
7. What are the testing principles the software engineer must apply while performing the software testing ?
8. Distinguish between verification and validation.
9. What is EVA ?
10. Identify the type of maintenance for each of the following :
  - a) correcting the software faults
  - b) adapting the change in environment.





## PART – B

(5×13=65 Marks)

11. a) Explain how work break down structure is used in software engineering. Discuss how software project scheduling helps in timely release of a product.

(OR)

- b) Which software process model is good for risk management ? Explain the model. Describe how the model is used to layout the objectives, risks and plans for quality improvement.

12. a) What is requirements elicitation ? Briefly describe the various activities performed in requirements elicitation phase with an example of a watch system that facilitates to set time and alarm.

(OR)

- b) What is SRS ? Explain in detail the various components of an SRS.

13. a) What is software architecture ? Describe the different software architectural styles with examples.

(OR)

- b) Explain in detail types of cohesion and coupling with examples.

14. a) i) Consider the pseudocode for simple subtraction given below : (9)

1) Program 'Simple Subtraction'

2) Input (x, y)

3) Output (x)

4) Output (y)

5) If  $x > y$  then DO

6)  $x - y = z$

7) Else  $y - x = z$

8) EndIf

9) Output (z)

10) Output "End Program".

Perform basis path testing and generate test cases.

- ii) Explain top down integration testing with an example. (4)

(OR)

- b) Write notes on :

i) regression testing

ii) refactoring

iii) debugging.

15. a) i) Describe in detail COCOMO model for software cost estimation. (9)

- ii) If Team A found 342 errors prior to release of software and Team B found 182 errors. What additional measures and metrics are needed to find out if the teams have removed the errors effectively ? Explain. (4)

(OR)

- b) Discuss the process of function point analysis. Explain function point analysis with sample cases for components of different complexity.

## PART – C

(1×15=15 Marks)

16. a) What is the purpose of DFD ? What are the components of DFD ? Construct DFD for the following system :

An on-line shopping system for XYZ provides many services and benefits to its members and staffs. Currently, XYZ staffs manually handle the purchasing information with the use of basic office software, such as Microsoft Office Word and Excel. It may results in having mistakes easily and the process is very inconvenient. XYZ needs an online shopping system at their Intranet based on the requirements of users. XYZ online shopping system has five key features :

- to provide the user friendly online shopping cart function to members to replace hardcopy ordering form;
- to store inventory and sales information in database to reduce the human mistakes, increase accuracy and enhance the flexibility of information processing;
- to provide an efficient inventory system which can help the XYZ staffs to gain enough information to update the inventory;
- to be able to print invoices to members and print a set of summary reports for XYZ's internal usage;
- to design the system that is easy to maintain and upgrade.

(OR)

- b) Consider the problem of determining the number of different words in an input file. Carry out structured design by performing transform and transaction analysis construct the structured chart.



B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Computer Science and Engineering

(Common to Information Technology)

(Also common to PTCS 6403 — Software Engineering for B.E. (Part – Time)  
for Fourth Semester – Computer Science and Engineering – Regulations 2014)

Maximum : 100 marks

PART A — (10 × 2 = 20 marks)

1. Differentiate Software engineering methods, tools and procedures.
2. What is EVA?
3. Define Data Dictionary.
4. Classify the following as functional / non-functional requirements for a Timer.
5. List the principles of a software design.
6. Which UI design patterns are used for the following:
  - (a) Page layout
  - (b) Tables
  - (c) Navigation through menus and web pages
  - (d) Shopping cart.
7. Distinguish between verification and validation.
8. Distinguish between Alpha and Beta testing.
9. What are the advantages and disadvantages of size measure?
10. For a project XYZ, defects reported by the customer are 5 and internal defects reported are 150. Find the defect leakage.

PART B — (5 × 13 = 65 marks)

11. (a) Which process model would you choose to manufacture a car? Explain the same.

Or

(b) What is function point analysis? Explain the process of project estimation using function points. Explain by considering the following. An ILF consisting of employee information can be updated with EIs that create employee information, delete an employee, or update employee information. An EQ permits display of current employee information. A telephone listing produced monthly, with a calculated total of employees by site, is counted as an EO. The telephone listing includes data retrieved from a personnel file maintained by another application: an EIF. Consider complexity of EO as medium and others as low.

12. (a) What is requirements elicitation? Briefly describe the various activities performed in requirements elicitation phase with an example.

Or

(b) Write the purpose of an SRS? List its components. Discuss in detail the components of SRS for functional requirements.

13. (a) (i) What is coupling? Explain the different types of coupling with examples. (10)

(ii) Consider the following case:

Process control component maintains current data about state of operation. Gets data from multiple sources. Supplies data to multiple sinks. Each source process writes directly to global data store. Each sink process reads directly from global data store.

What type of coupling exists in the system? How can it be overcome? (3)

Or

(b) What is software architecture? Describe in detail any three architectural styles giving suitable examples.

14. (a) Consider the pseudocode for simple subtraction given below:

(i) Program 'Simple Subtraction'

(ii) Input (x, y)

(iii) Output (x)

(iv) Output (y)

(v) If  $x > y$  then DO.

(vi)  $x - y = z$

(vii) Else  $y - x = z$

(viii) Endlf

(ix) Output (z)

(x) Output "End Program".

Compute the cyclomatic complexity for the same. Write down the test cases. Perform basis path testing and generate test cases.

Or

(b) What is black box testing? Explain in detail Boundary value analysis with an example.

15. (a) The time estimates (in hours) for the activities of a PERT network are given below:

Activity	$t_o$	$t_m$	$t_p$
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Where  $t_o$  is the optimistic time  $t_p$  is the pessimistic time and  $t_m$  is most likely time

(i) Draw the project network

(ii) Identify all paths through it and write critical path

(iii) Determine the expected project length.

Or

(b) Describe in detail COCOMO model for software cost estimation. Use it to estimate the effort required to build software for a simple ATM that produces 12 screens, 10 reports and has 80 software components. Assume average complexity and average developer maturity. Use application composition model with object points.

PART C — (1 × 15 = 15 marks)

16. (a) What is the purpose of DFD? Explain the components of the DFD. Construct the context diagram, level -0 DFD and level -1 DFD for a salary management system and explain.

Or

(b) Write about make/Buy decision making. Explain it with a scenario.



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### Fourth Semester

CS 6403 — SOFTWARE ENGINEERING

(Regulation 2013)

Maximum : 100 marks

**PART A — (10 × 2 = 20 marks)**

- ## STUCOR APP

7. What methods are used for breaking very long expression and statements?
8. What is the difference between verification and validation? Which types of testing address verification? Which types of testing address validation?
9. What is risk management?
10. How is productivity and cost related to function points?

PART B — (5 × 16 = 80 marks)

11. (a) Which process model is best suited for risk management? Discuss in detail with an example. Give the advantages and disadvantages of the model.

Or

- (b) (i) List the principles of agile software development. (8)
- (ii) Consider 7 functions with their estimated lines of code given below. (8)

Function	LOC
Func1	2340
Func2	5380
Func3	6800
Func4	3350
Func5	4950
Func6	2140
Func7	8400

Average productivity based on historical data is 620 LOC/pm and Labour rate is Rs. 8,000 per month. Find the total estimated project cost and effort.

12. (a) What is requirements elicitation? Briefly describe the various activities performed in requirements elicitation phase with an example of a watch system that facilitates to set time and alarm.

Or

- (b) 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 and level-1 DFD for a library management system.

13. (a) What is structured design? Illustrate the structured design process from DFD to structured chart with a case study.

Or

- (b) (i) Describe the golden rules for interface design. (8)
- (ii) Explain component level design with suitable examples. (8)

14. (a) (i) Consider the pseudocode for simple subtraction given below : (10)
- (1) Program 'Simple Subtraction'
- (2) Input (x, y)
- (3) Output (x)
- (4) Output (y)
- (5) If  $x > y$  then DO
- (6)  $x - y = z$
- (7) Else  $y - x = z$
- (8) EndIf
- (9) Output (z)
- (10) Output "End Program"
- Perform basis path testing and generate test cases.
- (ii) What is refactoring? When is it needed? Explain with an example. (6)

Or

- (b) What is black box testing? Explain the different types of black box testing strategies. Explain by considering suitable examples. (16)
15. (a) (i) Suppose you have a budgeted cost of a project as Rs. 9,00,000. The project is to be completed in 9 months. After a month, you have completed 10 percent of the project at a total expense of Rs. 1,00,000. The planned completion should have been 15 percent. You need to determine whether the project is on-time and on-budget? Use Earned Value analysis approach and interpret. (8)
- (ii) Consider the following Function point components and their complexity. If the total degree of influence is 52, find the estimated function points. (8)

Function type	Estimated count	Complexity
ELF	2	7
ILF	4	10
EQ	22	4
EO	16	5
EI	24	4

Or

- (b) Describe in detail COCOMO model for software cost estimation. Use it to estimate the effort required to build software for a simple ATM that produces 12 screens, 10 reports and has 80 software components. Assume average complexity and average developer maturity. Use application composition model with object points.



Reg. No. :

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**Question Paper Code : 50389****B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017****Fourth Semester****Computer Science and Engineering****CS 6403 – SOFTWARE ENGINEERING****Common to : Information Technology****(Regulations 2013)****Time : Three Hours****Maximum : 100 Marks****Answer ALL questions****PART – A****(10×2=20 Marks)**

1. Write the IEEE definition of software engineering.
2. Why LOC is not a better metric to estimate a software ?
3. Draw a use case diagram for an online shopping which should provide provisions for registering, authenticating the customers and also for online payment through any payment gateway like paypal.
4. Define Quality Function Development (QFD).
5. Write a note on FURPS model.
6. Draw the context flow graph of a ATM automation system.
7. Mention the purpose of stub and Driver used for testing.
8. Define verification and validation testing.
9. List out the principles of project scheduling.
10. Write a note on Risk Information Sheet (RIS).





PART – B

(5×13=65 Marks)

11. a) i) What is the impact of reusability in software development process ? (4)  
 ii) Explain the component based software development model with a neat sketch. (9)

(OR)

- b) i) Write a note on the unique characters of a software. (3)  
 ii) What is the significance of the spiral model when compared with other models. (3)  
 iii) Explain the CMMI model to assess the organization level. (7)
12. a) i) What is feasibility study ? How it helps in requirement engineering process ? (3)  
 ii) How will you classify the requirement types for a project, give example. (3)  
 iii) List the stake holders and all types of requirements for an online train reservation system. (7)

(OR)

- b) 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 (e.g. delivery person wrote down wrong address, deliver person brings wrong pizza). (13)

13. a) Discuss about the design concepts in a software development process. (13)

(OR)

- b) Discuss about User Interface Design of a Software with an example and neat sketch. (13)

14. a) Consider the following program segment.  

```
/* num is the number the function searches in a presorted integer array arr */
int bin_search (int num)
{
    int min, max; min = 0; max = 100;
    while (min != max) {
        if (arr[(min + max)/2] > num)
            max = (min + max)/2;
        else if (arr[(min + max)/2]
```

```
min = (min + max)/2;
else return ((min + max)/2);
}
return(- 1);
}
```

- i) Draw the control flow graph for this program segment. (2)  
 ii) Define cyclomatic complexity. (2)  
 iii) Determine the cyclomatic complexity for this program. (Show the intermediate steps in your computation. Writing only the final result is not sufficient) (9)

(OR)

- b) i) Explain how the various types of loops are tested. (9)  
 ii) Differentiate black box and white box testing. (4)

15. a) Explain in detail about the risk management in a software development life cycle. (13)

(OR)

- b) i) Discuss about COCOMO II model for software estimation. (8)  
 ii) Explain about the factors that cause difficulty in testing a software. (5)

PART – C

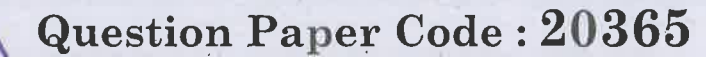
(1×15=15 Marks)

16. a) List out the various umbrella activities which support software development process and discuss about their necessity in maintaining the quality in both software process and product that is being developed for railway reservation system. (15)

(OR)

- b) Model a data flow diagram for a "Library Management System". State the functional requirements you are considering. (15)

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B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

### Fourth Semester

Computer Science and Engineering

CS 6403 — SOFTWARE ENGINEERING

(Common to Information Technology)

(Regulations 2013)

(Also common to PTCS 6403 – Software Engineering B.E. (Part-Time)  
Fourth Semester – Computer Science and Engineering–Regulations 2014)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the characteristics of a software.
2. Name the umbrella activities in software process.
3. Draw a use case diagram for an online shopping which should provide provisions for registering, authenticating the customers and also for online payment through any payment gateway like paypal.
4. Write a brief note on Petri Nets.
5. Mention the design quality model proposed by hewlett packard.
6. Draw the zero level data flow diagram of an ATM system.
7. What is meant by regression testing?
8. Define verification, validation testing and debugging.
9. Enumerate the factors that influence a project schedule
10. What is a Risk Information Sheet (RIS)?



PART B — (5 × 13 = 65 marks)

11. (a) Assume that you are the technical manager of a software development organization. A client approached you for a software solution. The problems stated by the client have uncertainties which lead to loss if it is not planned and Solved. What software development model you will suggest for this project? Justify. Explain that model with a neat sketch along with its pros and cons.

Or

- (b) (i) Draw the layered architecture of software engineering. (3)  
(ii) What are the merits and demerits of using formal methods for developing a software? (3)  
(iii) Explain the CMMI model to assess the organization level. (7)
12. (a) (i) What is feasibility study? How it helps in requirement engineering process? (3)  
(ii) How will you classify the requirement types for a project? Give example. (3)  
(iii) List the stake holders and all types of requirement for an online train reservation system. (7)

Or

- (b) 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 atleast two exceptions (e.g. delivery person wrote down wrong address, deliver person brings wrong pizza). (13)
13. (a) Explain the steps involved in conducting component level design when it is applied for object-oriented system. (13)

Or

- (b) Discuss about User Interface Design of a Software with an example and neat sketch. (13)
14. (a) Explain the process of unit testing and integration testing. (13)

Or

- (b) (i) Explain how various types of loops are tested. (9)  
(ii) Differentiate black box and white box testing. (4)

15. (a) (i) Explain the steps involved in project planning. (10)  
(ii) Discuss about various factors that affect a project plan. (3)

Or

- (b) (i) Discuss how Earned Value Analysis (EVA) helps to track a project quantitatively. (8)  
(ii) Explain about the factors that cause difficulty in testing a software. (5)

PART C — (1 × 15 = 15 marks)

16. (a) What is risk? How will you define and categorize it and what are the various risks that will happen from initialization phase of a software development to product delivery. Also explain how will you manage those risk in various phases. (15)

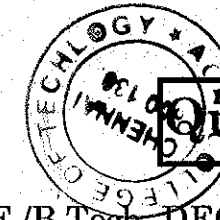
Or

- (b) For any problem of your choice (say for example stock monitoring system or key word frequency vector or key word in context that is used in Information Retrieval system), design atleast four different architectural design solutions using four different architectural styles. Compare these solutions based on atleast three quality attributes. Note that the problem can be of your choice, the example given need not be considered.



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**Question Paper Code : 91399**

**B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019**

**Fourth Semester**

**Computer Science and Engineering  
CS 6403 – SOFTWARE ENGINEERING  
(Common to Information Technology)**

**(Regulations 2013)**

**(Also common to PTCS 6403 – Software Engineering for B.E. (Part-Time) –  
Fourth Semester – Computer Science and Engineering – Regulations 2014)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions**

**PART – A**

**(10×2=20 Marks)**

1. Suggest a model to be used when enough staffing is unavailable and why.
2. State the pros and cons of COCOMO model.
3. Identify the notations for requirements specification.
4. State the applications of petri nets.
5. What is the use of fan in and fan out ?
6. Distinguish between class based components and traditional components.
7. How to calculate the reliability of the module ?
8. "Integration testing is harder than unit testing". Justify.



9. Estimate the function point for the below system.

Using the following table for function point weightings :

Factors	Weights		
	Simple	Average	Complex
Number of user inputs	3	4	6
Number of user outputs	4	5	7
Number of user inquiries	3	4	6
Numer of files	7	10	15
Number of external interfaces	5	7	10

A system being developed has the following characteristics :

Number of user inputs	10 (simple)
Number of user outputs	7 (simple)
Number of user inquiries	3 (average)
Number of files	6 (average)
Number of external interfaces	1 (complex)

10. Predict the expected cost for any branch of the decision tree in Make / Buy decision scenario.

#### PART – B

(5×13=65 Marks)

11. a) i) Explain the term "Engineering" in Software Engineering. (3)  
 ii) Describe at least one scenario where 'RAD model would be applicable than not the waterfall model'. (10)  
 (OR)  
 b) i) Summarize in detail about risk management. (5)  
 ii) Elaborate on how LOC and FP can be used in project estimation. (8)
12. a) A software system is to be developed to automate a library catalogue. This system will contain information about all the books in a library and will be usable by library staff and by book borrowers and readers. The system should support catalogue browsing, querying, and should provide facilities allowing users to send messages to library staff reserving a book which is on loan. For the above specification mention sketch the outline of requirements document as per the IEEE standard format.  
 (OR)  
 b) Illustrate in detail about  
 i) Petri nets (6)  
 ii) Data Dictionary. (7)

13. a) Outline clearly the concepts and types of coupling and cohesion with examples of each.

(OR)

- b) Design and illustrate the user interface design for an webpage advertising underwater submarine.

14. a) Demonstrate the differences between black-box and structural testing and suggest how they can be used together in the defect testing process.

(OR)

- b) i) Identify the purpose of regression testing. What are the two main activities of regression testing? (9)  
 ii) Why do we need validation testing? Explain. (4)

15. a) Explain in detail about the various phases, steps and activities that are needed for planning and managing a project with an illustration.

(OR)

- b) Describe in detail about :  
 i) Risk Mitigation, Monitoring and Management Plan (RMMM) (8)  
 ii) Earned Value Analysis (EVA). (5)

#### PART – C

(1×15=15 Marks)

16. a) Given,  
 Number of user inputs = 15  
 Number of user outputs = 13  
 Number of external interfaces = 11  
 1 function point = 20 LOC (as fourth generation language is used).  
 Values of constant used in basic COCOMO model.  $a = 2.4$ ,  $b = 1.05$ ,  $c = 2.5$ ,  $d = 0.38$ .  
 Calculate and evaluate the effort and duration using the above details for basic COCOMO model.

(OR)

- b) For each of the following types of projects, choose the most appropriate life cycle model and justify your choice by a couple of lines of explanation  
 i) You are migrating a legacy application in mainframes to Oracle. The project goes through well-defined phases of contract signing, taking each program of the current system with a well-defined acceptance test data, converting it to Oracle and proving that the output matches the expected output. It is not possible to seek intermediate feedback. (8)  
 ii) You are developing a proof-of-concept to show your prospect on how your product is suited for developing wireless applications. You do not have access to expensive CASE tools. (7)