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Question Paper Code : 80294

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Fourth Semester

Computer Science and Engineering

CS 6403 — SOFTWARE ENGINEERING

(Common to Information Technology)

(Regulation 2013)

Maximum : 100 marks

Time : Three hours

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. If you have to develop a word processing software product, what process model will you choose? Justify your answer. — *Incremental*
2. Depict the relationship between Work product, task, activity and System.
3. Classify the following as functional / non-functional requirements for a banking system
 - (a) Verifying bank balance — *fn*
 - (b) Withdrawing money from bank — *fn*
 - (c) Completion of transactions in less than one second — *non-fn*
 - (d) Extending the system by providing more tellers for customers. — *fn*
4. What is a data dictionary?
5. What architectural styles are preferred for the following systems? Why?
 - (a) networking
 - (b) web based systems
 - (c) banking system.
6. What UI design patterns are used for the following?
 - (a) Page layout
 - (b) Tables
 - (c) Navigation through menus and web pages
 - (d) Shopping cart.

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. *Special*

Or

- (b) (i) List the principles of agile software development. *→ one of my job* (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.

- ⑥ 1) The type of information flow established
 2. flow boundaries are indicated
 3. DFD is mapped into the program structure
 4. ctrl hierarchy is defined
 5. the resultant structure

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Question Paper Code : 57250

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

ER dia is a Entity Relationship dia, showing the relationship
 b/w diff entities. Answer ALL questions.

DFD is a symbolic structure showing how the flow of
 data is used in different process stages.

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.
 ① S/W is developed or engineered; it is not manufactured in classical sense
3. List the characteristics of a good SRS.
 ② S/W doesn't wear out is moving toward
 ③ Although the industry is moving toward
 compound based instruct, most S/W is custom
 to build
4. What are the linkages between data flow and E-R Diagram ?
 correct, unambiguous, complete, consistent, verifiable, modifiable, traceable
5. If a module has logical cohesion, what kind of coupling is this module likely to have ?
 control coupling (one module explicitly
 controls the logic of the
 other)
6. What is the need for architectural mapping using data flow ?
7. How can refactoring be made more effective ?
 Refactoring is the process of changing a S/W
 system in such a way that it doesn't alter
 the external behaviour of the code.
8. Why does software fail after it has passed from acceptance testing ?
9. List a few process and project metrics.
 FP metric, object metric, size oriented metrics, usage oriented
 metrics.
10. Will exhaustive testing guarantee that the program is 100% correct ?
 No ?

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 break-down? (8)

OR

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

(4 × 4 = 16)

13. (a) Write short notes on the following.

- (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 inquires 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)

(i)

$$\begin{aligned} \text{external I/P} &= 10 \times 3 = 30 \\ \text{O/P} &= 8 \times 4 = 32 \\ \text{ILF} &= 13 \times 7 = 91 \\ \text{EIF} &= 17 \times 5 = 85 \\ \text{Inq} &= 11 \times 3 = 33 \\ & \quad \quad \quad \underline{271} \end{aligned}$$

$$\begin{aligned} \text{FP} &= 271 \times [0.65 + 0.01 \times 1.10] \\ &= 179 \underline{-131} \end{aligned}$$