End Semester Examination
Nov – Dec 2018

Max. Marks: 60
Class: T.E.
Course Code: IT51
Name of the Course: Software Engineering

Duration: 3Hrs
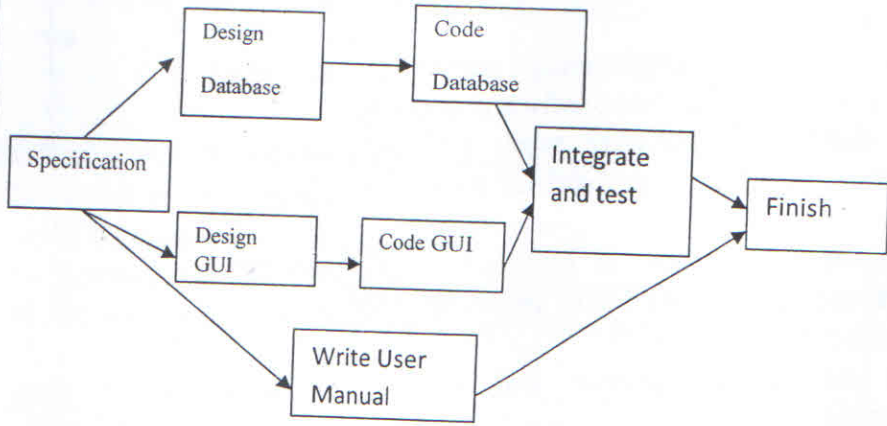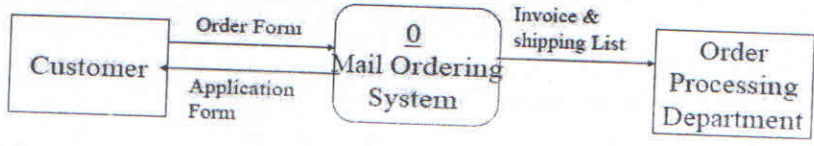Semester:V
Branch:Information Technology

SYNOPTIC

QNo		Marks	CO

Q1a)	software process-
	Software engineering process is glue that holds the technology layers together and enables rational and timely development of computer software. It define framework that must be established for effective delivery of software engineering technology. It forms a basis for management control of software project and establishes the context in which technical methods are applied, work products are produced, milestones are established, quality is ensured and changes is managed.
	
	Process Framework Activities (Any 3)
	    1) Communication
	    2) Planning
	    3) Modeling
	    4) Construction
	    5) Deployment
		2
		
		3
			CO1

b)	Description on" problems that may crop up when a development process is not adequately documented" (2Marks)
	Key points:
	    1) A documented process model ensures that every activity in the life cycle is accurately defined.
	    2) An undocumented process gives clear indication to the members of the development teams about the lack of seriousness.
		7	Co1

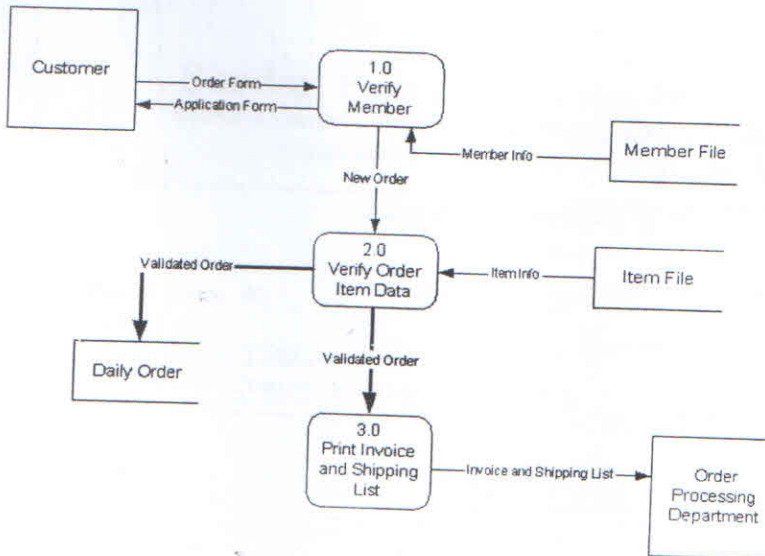|			

	3) May face problem with Quality
	
	Diagram-2Marks
	Description on phases (Speculation, Collaboration, Learning) - 3Marks
	
	OR
	
	Principal of scrum agile process model.(3marks)
	   1) Small working team
	   2) The process must be adaptable
	   3) The process yield frequent software increments
	   4) Development work and the people who perform
	
	Diagram-(2Marks)
	Set of development activities.(2marks)
	   1) Backlog
	   2) Sprints
	   3) Scrum meeting
	   4) Demos		

Q2 a)	Assuming $\sum(F_i) = 38$
	Function Point = Count total X [0.65 +0.01 X $\sum(F_i)$] (2Marks)
	          = 2972 X [0.65+0.01X38]
	          =3061.16
	Effort = FP/Productivity (2Marks)
	Cost = FP X Cost (2Marks)
		6	Co3

b)	Six reliability Metrics of software product(Each carry one mark)
	   1) Rate of occurrence of failure
	   2) Mean time to failure
	   3) Mean time to repair
	   4) Mean time between failure
	   5) Probability of failure on demand
	   6) Availability
	OR
	Quality Definition: (2Marks)
	Conformance to explicitly stated functional and performance requirements, explicitly documented development standards, and implicit characteristics that are expected of all professionally developed software.
		6	Co3

	3) May face problem with Quality
	
	Diagram-2Marks
	Description on phases (Speculation, Collaboration, Learning) - 3Marks
	
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		Role of SQA : (4Marks) 1) Prepares an SQA plan for a project. 2) Participates in the development of the project's software process description. 3) Reviews software engineering activities to verify compliance with the defined software process. 4) Audits designated software work products to verify compliance with those defined as part of the software process. 5) Ensures that deviations in software work and work products are documented and handled according to a documented procedure. 6) Records any noncompliance and reports to senior management.		

Q3
a)
		a) Following are possible risks. (Identification of each risk carry 1 Mark)
		
		Risk 1- Sales orders routed via the ISP – can they be falsified or otherwise compromised?
		Risk 2-The VPN – an internet 'tunnel' – can it create vulnerabilities to security breaches or hacker-access to corporate documents?
		
		    b) Rank the identified risks in priority order.
		  i. Highest priority order risks are related to the security of the transactions, and to the privacy of users and staff of the IT Company.
		  ii. Mid-priority risks relate to the availability and reliability of the online application.
		 iii. Low-priority risks involve the reparability or maintainability of the service.
		    c) Some mitigation action that is appropriate for each risk, giving your reasons.
		Mitigation strategies:
		Risk 1-For the ISP routing of sales orders – review that at ISP has access to the company's orders. Try to arrange automatic forwarding or automatic stire-and forward without human intervention. .
		Risk 2-For the VPN – implement a security policy including physical and IT controls, audits and reviews.
			2
			
			2
			
			4
				Co3

b)	**Work breakdown structure:** Diagram must have proper Decomposition of Activity, Level must be defined properly. Design Database → Code Database Specification → Design Database Specification → Design GUI → Code GUI → Integrate and test → Finish Specification → Write User Manual → Finish	4	Co3
Q4 a)	Diagram must have proper identification of process; Input and output. Each arrow has to be properly label. Proper decomposition required at each level. Level 0 DFD Customer — Order Form → 0 Mail Ordering System 0 Mail Ordering System — Application Form → Customer 0 Mail Ordering System — Invoice & shipping List → Order Processing Department	8	Co2

Level 1

Level 2:

Process identified at level 1 can be further decomposing to show detail design.

b)	Yes ,it is true that whenever you increase the cohesion of your design, coupling in the design would automatically decrease.(1Mark) Justification-(3marks) Key points: Cohesion is a measure of the functional strength of a module. Coupling between two modules is a measure of the degree of interaction between two modules.	4	Co2

Q5
a)
	Why design test cases (2Marks)
	Testing software using large collection of randomly selected test cases does not guarantee that all ʾof the errors in the system will be uncovered. All test cases in the larger test suits help detect the same error while the other error in the code remains undetected. This implies that for effective testing the test suit should be carefully designed.
	
	a)Three equivalence classes (1Marks)
	    i) Set of negative integers
	    ii) Integers in a range of (0 and 5000ʾ
	    iii) Integer larger than 5000.
		6	Co4

The possible test suite (1Marks)
{-3,500,6000}
b) Test suite(2Marks)
{0,-1,5000,5001}

<div align="center">OR</div>

Two Main types of errors:(2 Marks)
1) Incorrect specifications
2) Interactions among subsystems.

Description on scenario Based testing –(2 Marks)
Example: (2 Marks)

		6	Co4

b)

<u>Sample flow graph</u> (2Marks)

Cyclomatic complexity of the flow graph. (2Marks)

$$V(G) = E - N + 2$$
$$= 19 - 14 + 2$$
$$= 7$$

Set of independent paths. (2Marks)
Path 1: 1 - 2 - 3 - 5 - 7 - 9 - 11 - 13 - 14
Path 2: 1 - 3 - 4 - 14
Path 3: 1 - 3 - 5 - 6 - 14
Path 4: 1 - 3 - 5 - 7 - 8 - 14
Path 5: 1 - 3 - 5 - 7 - 9 - 10 - 14
Path 6: 1 - 3 - 5 - 7 - 9 - 11 - 12 - 14
Path 7: 1 - 3 - 5 - 7 - 9 - 11 - 13 – 14