KIIT Deemed to be University
Online Mid Semester Examination(Autumn Semester-2020)

Subject Name & Code: Software Engineering (IT 3003)
Applicable to Courses: CSE, IT, CSSE, CSCE

Full Marks=20 **Time:1 Hour**

SECTION-A(Answer All Questions. All questions carry 2 Marks)

Time:20 Minutes **(5×2=10 Marks)**

Question No	Question Type(MCQ/SAT)	Question	Answer Key(if MCQ)	CO Mapping
Q.No:1(a)	SAT	Distinguish between software products and services. Give examples of each one.		CO1
	SAT	Give your opinion on why a data-flow oriented design is likely to produce better designs than a control-flow oriented design technique?		CO1
	SAT	Do you agree with the following statement—"the focus of exploratory programming is error correction while the software engineering principles emphasize error prevention"? Justify your answer.		CO1
	SAT	Software Engineering principles are meant for developing software products. Justify.		CO1
Q.No:1(b)	SAT	If you want to develop a high risk large software product what process model will you choose? Justify your answer.		CO1
	SAT	What problems might a software development organization face if it does not follow any life cycle models during development of a large software product?		CO1
	SAT	What do you understand by the term phase		CO1

		containment of errors? Why is it important ? How can phase containment errors achieved?		
	SAT	Spiral model is also referred as a meta model. Justify		CO1
Q.No:1(c)	**SAT**	If you want to develop a high risk large software product what process model will you choose? Justify your answer.		CO3
	SAT	Describe briefly about different project planning activities. What are the possible outcomes of poor project planning?		CO3
	SAT	Consider the following requirement for a word processor software: "The software should provide facility to import an existing image available as a jpeg file into the document being created." Which one of the following types of requirement is this? (i) Functional requirement (ii) Non-functional requirement (iii) Constraint on the implementation (iv) Goal of implementation		CO2
	SAT	What are the different category of users of the SRS documents? What are their expectations from the SRS document?		CO2
Q.No:1(d)	**SAT**	As the manager of a software project to develop a product for business application. If you estimate the effort required for completion of the project to be 50 person-months. Can you complete the project by employing 50 developers for period of one month? Justify your answer.		CO3

	SAT	How to find the size of a software product using Lines of Counts (LOC)? Write its shortcomings.		CO3
	SAT	For same number of lines of code and same development team size, Rank the following projects in Oder of their estimated development time: a) An employee pay roll system b) A Text Editor **c)** An Operating System for new Computer		CO3
	SAT	What is slack time in CPM of activity network? Explain.		CO3
Q.No:1(e)	**SAT**	What is the difference between software verification and validation?		CO5
	SAT	Explain 3 different types of Maintenance approach.		CO6
	SAT	What are the symptoms of software crisis? What are possible solutions to the present crisis?		CO1
	SAT	State the major advantages of Object-Oriented Design methodologies over traditional approach.		CO4

SECTION-B(Answer Any One Question. Each Question carries 10 Marks)

Time: 30 Minutes **(1×10=10 Marks)**

Question No	Question	CO Mapping
Q.No:2	A) Differentiate between Spiral and evolutionary models with suitable diagrams with their advantages and disadvantages. Mention a situation where a development team must follow the prototype model to develop a software. [2.5+2.5] B) The size of software product has been estimated to be 32,000 lines of source code. Assume that the average salary of software engineers be Rs. 20,000/-	CO1 , CO3

	per month. Determine the effort required to develop the software product and the nominal development time and the cost of the project for each of the three modes i.e organic, semidetached and embedded. [2+2+1]	
Q.No:3	A) Briefly describe the process of Agile SDLC with a neat diagram. Explain the concept of Scrum and Extreme programming with examples. Suppose you are in the middle of the sprint and the product owner has come with one new requirement from the customer. What you do and what is the best way to handle the change request. [2+2+1] B)Consider a software project with 5 tasks T1–T5. Duration of the 5 tasks in weeks are 3,2,3,5,2 respectively. T2 and T4 can start when T1 is complete. T3 can start when T2 is complete. A T5 can start when both T3 and T4 are complete. Draw the CPM activity network representation of the project. When is the latest start date of the task T3. What is the slack time of the task T4. Which tasks are on the critical path? [2+1+1+1]	CO_1 , CO_3
Q.No:4	A) Software project of size 250 KLOC is to be developed. The team has average experience and the schedule is not very tight. Calculate effort, development time, productivity and average staffing. [2+1+1] B) Consider the following case study and identify and represent the functional and no-functional set of requirements: **Automation of the office work at the CSE department** The academic, inventory, and financial information at the CSE (Computer Science and Engineering) department of a certain institute was being carried out manually by two office clerks, a store keeper, and two attendants. The department has a student strength of 500 and a teacher strength of 30. The Director wants to automate the office work. Considering the low budget that he has at	CO_3 , CO_2

	his disposal, he entrusted the work to a team of student volunteers. For requirements gathering, a member of the team who was responsible for requirements analysis and specification (analyst) was first briefed by the Director about the specific activities to be automated. The Director mentioned that three main aspects of the office work needs to be automated—stores-related activities, student grading activities, and student leave management activities. It was necessary for the analyst to meet the other categories of users. The Director introduced the analyst (a student) to the office staff. The analyst first discussed with the two clerks regarding their specific responsibilities (tasks) that were required to be automated. For each task, they asked the clerks to brief them about the steps through which these are carried out. The analyst also enquired about the various scenarios that might arise for each task. The analyst collected all types of forms that were being used by the student and the staff of the department to register various types of information with the office (e.g. student course registration, course grading) or requests for some specific service (e.g. issue of items from store). He also collected samples of various types of documents (outputs) the clerks were preparing. Some of these had specific printed forms that the clerks filled up manually, and others were entered using a spreadsheet, and then printed out on a laser printer. For each output form, the analyst consulted the clerks regarding how these different entries are generated from the input data. The analyst met the store keeper and enquired about the material issue procedures, store ledger entry procedures, and the procedures for raising indents on various vendors. He also collected copies of all the relevant forms that were being used by the store keeper. The analyst also interviewed the student and faculty representatives. Since it was needed to automate the existing activities of an working office, the analyst could without much difficulty obtain the exact formats of the input data, output data, and the precise description of the	

	existing office procedures. [6]	
Q.No:5	A)Explain how FP overcomes some disadvantages of LOC approach. Compute the function point value for a project with the following information domain characteristics: Number of user Inputs: 24 (5 complex, rest medium) Number of user Outputs: 65 (15 complex, rest medium) Number of user Inquiries: 12 Number of Files: 12 Number of external interfaces: 4 Various processing complexity(DI) factors are: 4, 1, 0, 3, 3, 5, 4, 4, 3, 3, 2, 2, 4, 5 [2+3] B)Assume that you are a 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. Which software development model you will suggest for this project- Justify. Explain that model with its pros and cons and neat sketch. [5]	CO3 , CO1
Q.No:6	A) Using the table below, draw the network diagram and answer the below questions. Further do the forward/backward pass. [7] 1. How many paths are in the network, and what are they? 2. What is the critical path and its duration?	CO3 , CO2

Activity	Predecessor	Estimate in weeks
Start	-	0
C	Start	6
B	Start	4
P	Start	3
A	C, B, P	7
U	P	4
T	A	2
R	A	3
N	U	6
End	T, R, N	0

	3. What is the float on activity U? 4. What is the impact to the project if activity B takes three weeks longer than planned? B)SRS acts as an agreement between customer and the development organization, Justify this with example. [3]	

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