CLASS: MCA
BRANCH: MCA

SEMESTER : II
SESSION : SP/2023

SUBJECT: CA415 SOFTWARE ENGINEERING PRINCIPLES

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Distinguish between Software products and Software Services with an example. Explain briefly the principles deployed by Software Engineering to overcome the problems of Human Cognitive Limitations.	[5]	1	K1,K2
Q.1(b)	Define SDLC. Explain the importance of documented development process. What is difference between programming-in-the-small and programming-in-the large. Is using SDLC model a good idea for programming-in-the-small? Explain your answer.	[5]	1	K1,K2
Q.2(a)	Explain briefly the five important characteristics of a good SRS document	[5]	2	K1,K2
Q.2(b)	Analyze the following requirements (i)"When the room temperature becomes high ,then switch on the AC".(ii)(a)The ceiling fan of the board room should be switched-on when the temperature of the room rises above 30° C.(b)When the temperature of the board room rises above 30°C,then AC should be switched-on and the ceiling fan should remain off.(iii)If the internal temperature of the chemical reactor exceeds 200°C then the alarm bell must be sounded".	[5]	2	K4
Q.3(a)	"It is important to realize that a DFD represents only Data flow, and it does not represent any control information". Explain with an example. Construct a DFD (Level-0, level-1 and level-2) of RMS calculating software. Also prepare a data dictionary.	[5]	3	K2,K6
Q.3(b)	Explain the differences (only 2) between Function-oriented-design and Object-oriented-design with an example. Consider the following layered design:M1 connected to M2, M3 and M4. M4 is connected to M5 and M6. Calculate the Fan-out and Fan-in of all the modules. Explain the significance of Fan-in and Fan-out.	[5]	3	K3,K4
Q.4(a)	Explain Mutation Testing with an example. Design Minimum number of MC/DC test cases for the segment (((a || b) && c) || d) && e.	[5]	4	K6
Q.4(b)	A program reads three numbers, A, B and C with a range [1,50] and prints the largest number. Design the test cases for this program using equivalence class partitioning technique.	[5]	4	K6
Q.5(a)	A software project has size S KLOC. The team has average experience on similar type of projects. the project schedule is not very tight. Determine Effort(E), Development time(D), average staff size(A) and productivity(P) of the project in proper units. (Assume: a, b, c, d as constants). Explain briefly Function Points.	[5]	5	K4
Q.5(b)	Draw McCalls Software Quality circle. A WindowsNT server crashes on the average once in 30 days, that is, the Mean Time Between Failures (MTBF) is 30 days. When it happens it takes 12 hours to reboot it, that is, Mean Time To Repair (MTTR) is 12 hours. Calculate the availability of the server.	[5]	5	K6

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