National University of Computer and Emerging Sciences
Lahore Campus

Soft. Qty. Eng. (SE3002)

Date: November 4th 2024

Student Name _____ Roll No _____ Section _____ Student Signature _____

Course Instructor(s)

Dr. Ali Afzal Malik (BSE-5A; BSE-5B)

Ms. Javeria Sadiq (BSE-5C)

Attempt all questions on the question paper. Neither use nor submit any extra sheet.

Sessional-II Exam

Sections: ALL
Total Time: 1 Hour
Total Marks: 30
Weight: 15%
Total Questions: 02

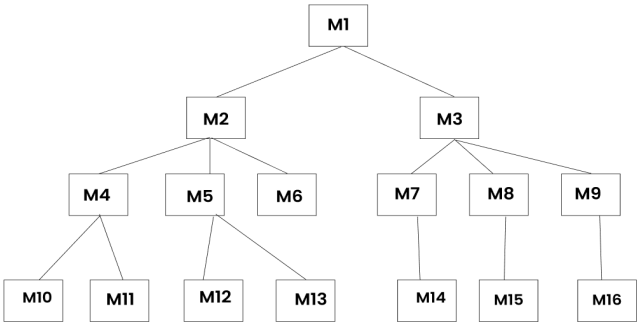
Instructions:

CLO 1: Explain different views of quality

Q1

.... [5 + 5 = 10]

The diagram below shows the call-and-return architecture of a Café Management System (CMS). Each box represents a module and each line represents a call/return path between modules.



a. How many stubs will be needed in the top-down, breadth-first incremental integration testing of CMS? Explain your answer by providing a detailed break-up. No partial credit.
15 stubs will be needed.
2 Stubs for M1: M2, M3
3 Stubs for M2: M4, M5, M6
3 Stubs for M3: M7, M8, M9
2 Stubs for M4: M10, M11

2 Stubs for M5: M12, M13
1 Stub for M7: M14
1 Stub for M8: M15
1 Stub for M9: M16

b. How many drivers will be needed in the bottom-up, breadth-first incremental integration testing of CMS? Explain your answer by providing a detailed break-up. No partial credit.

8 drivers will be needed.

M10, M11 need driver M4
M12, M13 need driver M5
M14 needs driver M7
M15 needs driver M8
M16 needs driver M9
M4, M5, M6 need driver M2
M7, M8, M9 need driver M3
M2 and M3 need driver M1

CLO 1: Explain different views of quality

Q2

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..... [10 + 10 = 20]

An online financial aid processing application of a private university determines the tuition waiver given to a student by looking at the income class of the student's family (H = High, A = Average, L = Low), the gender of the student (M = Male, F = Female), and the CGPA of the student (1.0 – 2.0, 2.1 – 3.0, 3.1 – 4.0). The tuition waiver calculation module of this application uses the tuition waiver percentages shown in the table below.

Income Class		H		A		L	
Gender		M	F	M	F	M	F
CGPA	*1.0 – 2.0*	0	10	10	20	20	30
	2.1 – 3.0	10	20	20	30	30	40
	3.1 – 4.0	20	30	30	40	40	50

Use ECP and BVA to fill out the following two tables for black-box testing of the tuition waiver calculation module. Use **minimum** test cases in the last table.

Variable	**Valid ECs**	**Representing values**		**Invalid ECs**	**Representing values for invalid ECs**
		For valid ECs	**Boundary values**		
Income Class	(1) H (2) A (3) L	H A L		(1) Other than H, A, or L	G
Gender	(1) M (2) F	M F		(1) Other than M or F	X
CGPA	(1) 1.0 – 2.0 (2) 2.1 – 3.0 (3) 3.1 – 4.0	1.5 2.5 3.5	1.0, 2.0 2.1, 3.0 3.1, 4.0	(1) Values < 1.0 (2) Any alpha-numeric values (not CGPA)	0.5 ABC

Test case type	**Test case no.**	**Income Class**	**Gender**	**CGPA**	**Test case results**
For valid ECs	1	H	M	1.5	0
	2	A	F	2.5	30
	3	L	M	3.5	40
	4	H	M	1.0	0
	5	H	M	2.0	0
	6	H	M	2.1	10
	7	H	M	3.0	10
	8	H	M	3.1	20
	9	H	M	4.0	20
For invalid ECs	10	G	M	2.5	Invalid income class
	11	H	X	2.5	Invalid gender
	12	H	M	0.5	Invalid CGPA
	13	H	M	ABC	Invalid CGPA
