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Daffodil International University

Faculty of Science & Information Technology
Department of Software Engineering
Final Examination, Fall 2025;
Course Code: SE 113; Course Title: Introduction to Software Engineering
Sections & Teachers: (A-D) RM, (E) TM, (F, G)MKS,(H-J) DSM, (K)SSI, (L,M)IAT, (N-P)NJN, (Q)DMA

Time: 2:00 Hrs **Marks: 40**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1. A software team is developing an online food delivery application. One module calculates the delivery fee based on distance, time, and discount codes. Another module retrieves real-time distance data from an external map API. During development, the team notices that the delivery fee calculations are producing unexpected results, and sometimes the system fails when the map API responds slowly. — **CLO-1** *Level-2*

a)	Based on the scenario, **Classify** whether **Unit Testing** or **Integration Testing** is the most suitable testing approach to apply first. **Clarify** your choice with proper reasons.	[Marks-5]
b)	**Observe** two risks from the above scenario and *discuss* suitable risk responses for them.	[Marks-5]

2. BD transportation authority operates an online smart ticketing system where passengers can create accounts, log in, purchase bus/train tickets, recharge travel cards, and view trip history. Conductors can check passenger bookings, validate QR codes, and report route issues in real time. The transport admin manages route schedules, fare updates, driver profiles, and system-wide operations to ensure smooth and efficient public transportation services. — **CLO-2** *Level-3*

a)	**Derive** the functional requirements and actors from the scenario and draw a Use Case Diagram using appropriate include and extend relationships.	[Marks-8]
b)	Adjacency Matrix	[Marks-7]

	1	2	3	4	5	6	7	8
1	0	1	0	0	0	0	0	0
2	0	0	1	1	0	0	0	0
3	0	0	0	0	1	0	0	0
4	0	0	0	0	0	1	1	0
5	0	1	0	0	0	0	0	1
6	0	0	0	0	0	0	0	1
7	0	0	0	0	0	0	0	1
8	0	0	0	0	0	0	0	0

a) **Draw** the control-flow-graph from the adjacency matrix
b) **Compute** the cyclomatic complexity of the drawn CFG

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3.	*a)*	A university is planning to build an AI-based facial recognition attendance system. As the project manager, **describe** the key actions you would take in each phase of the Project Management Life Cycle to address challenges such as limited budget and a tight schedule.	[Marks-5]	CLO-3 Level-2
	b)	A project team is estimating effort using the **Intermediate** COCOMO model. They estimated the size of the project to be 90 KLOC. Assume the project has a few cost drivers and their estimated **EAF** value is **2.002.**	[Marks-5] [2 + 2 + 1]	
	c)	**Visualize** the network diagram from the above table. **Observe** all the possible paths and their duration to **compute** the critical path of the project.	[Marks-5]	

Module Coefficients

Mode	a_i	b_i	c_i / c_b	d_i / d_b
Organic	2.4	1.05	2.5	0.38
Semi-Detached	3.0	1.12	2.5	0.35
Embedded	3.6	1.2	2.5	0.32

Compute the following using the Semi-Detached Mode of Intermediate COCOMO model:

1) Total effort required,
2) Development time,
3) the number of people required.

Activity	Immediate Predecessor	Estimated Duration
A	None	5
B	A, C	4
C	None	6
D	C	5
E	B	9
F	D	7
G	E	5
I	F,G	6
H	I	5

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