



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 <u>passengers</u> can create accounts, <u>log in</u> , <u>purchase bus/train tickets</u> , <u>recharge travel cards</u> , and <u>view trip history</u> . <u>Conductors</u> can check passenger bookings, <u>validate QR codes</u> , and <u>report route issues</u> in real time. The transport <u>admin</u> manages <u>route schedules</u> , <u>fare updates</u> , <u>driver profiles</u> , and <u>system-wide operations</u> 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 <table><tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>2</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>3</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>4</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td></tr><tr><td>5</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr><tr><td>6</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr><tr><td>7</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr><tr><td>8</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>		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	[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																																																																																			

CLO-3
Level-2

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]

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**.

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

[Marks-5]

[2 + 2 + 1]

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.

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.~~

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

[Marks-5]