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Daffodil International University

Faculty of Science & Information Technology

Department of Software Engineering

Final Examination, summer 2026

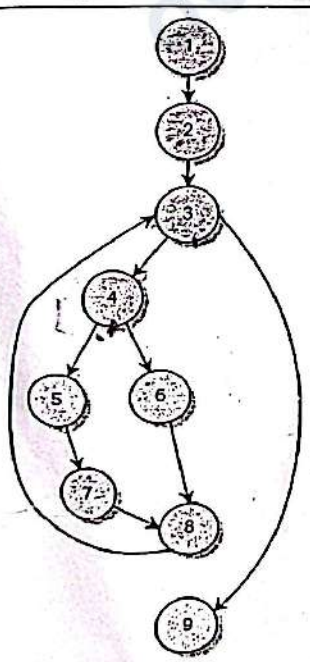
Course Code: SE113; Course Title: Introduction to Software Engineering

Sections & Teachers: MMN (48-A-D), NML (48-E, L, M), RHH (48-F-I), RRB (48-J, K) FF (48-N)

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)	A software company is developing an online hospital management system and plans to use AI throughout the Software Development Life Cycle (SDLC). **Discuss** the use of AI in each phase of the SDLC based on the above scenario.	[Marks-2]	CLO-2 *Level-2*
	b)	A software company is developing a new online shopping application. Before starting the actual development, the team creates a basic version of the system to demonstrate its features, collect user feedback, and identify requirement changes early. **Explain** the concept of a software prototype based on the above scenario.	[Marks-3]	
2.	a)	A developer analyzes the internal logic and execution paths of a student grading program to test it. At the same time, the system accepts marks between 0 and 100, so the tester checks values just below, at, and just above the boundaries. **Demonstrate** the type of testing techniques used in both scenarios.	[Marks-3]	CLO-3 *Level-3*
	b)	 **Calculate** the Cyclomatic Complexity using adjacency matrix, predicated nodes and region from the above Control Flow Graph (CFG).	[Marks-7]	

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3. a) The project consists of the following tasks:

[Marks- 10] | **CLO-4** *Level-3*

Activity	Dependency	Duration
A	B	2
B	-	4
C	B	3
D	C	2
E	C	5
F	A	4
G	D,E	6
H	E,F,G	7
I	H	5

Draw the task dependency diagram. Then, **demonstrate** the critical path and total project duration and **illustrate** the significance of Float = 0, Float>0 in Critical Path analysis.

b) Assume that the expected size of an embedded software project is 48.3 KLOC. Using the coefficients in the table below and the Basic COCOMO model, **calculate** Effort, Development Time and Number of People required to complete the project.

[Marks-5]

Project Class	a_b	b_b	c_b	d_b
Organic	2.4	1.05	2.5	0.38
Semidetached	3.0	1.05	2.5	0.38
Embedded	3.6	1.12	2.5	0.12

4. a) **Demonstrate** software risks and the seven principles of risk management.

[Marks-5] | **CLO-5** *Level-3*

b) Two software engineers are evaluating a newly developed mobile banking application. Rahim evaluates the software by collecting users' opinions about its usability and interface design, while Karim evaluates the software by measuring response time, error rate, and system performance using numerical data.

[Marks-5]

Determine which type of quality assessment Rahim and Karim are performing, and provide proper justification to support your answer.