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Daffodil International University

Faculty of Science & Information Technology

Department of Software Engineering

Final Examination, Spring 2025; Course Code: SE 113;

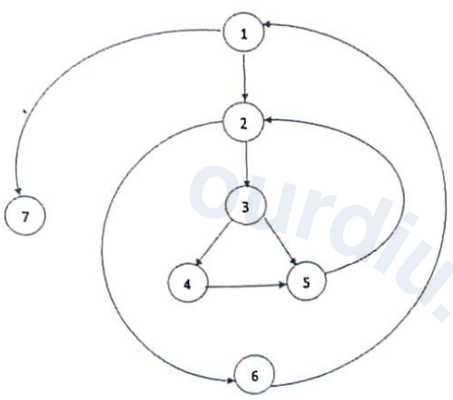
Course Title: Introduction to Software Engineering

Sections & Teachers: A, B, C, D, E, F, G, H, I, J, K, L, M & SS, MKS, NS, KR, LA, SA

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.		In a hospital management system, Patients can register by an admin officer and they can also schedule appointments with doctors. Doctors and admin officer manage these appointments and can admit them in hospital. In case of seats are full, the patients may book a seat when admission is not possible. During consultations, doctors update medical records, including diagnosis and treatment details. Both doctors and patients can view diagnosis and treatment records. The system also allows making various reports related to patient history and billing, which can be accessed by doctors and administrators. Patients, and administrators are involved in billing and payment processes. All users, including patients, doctors and administrators, must authenticate themselves through login to access the system securely.		**CLO-2** *Level-3*
	a)	**Derive** a clear use case diagram from the above scenario with detailing all actors and functions as given.	**[Marks-5]**	
	b)	**Produce** a description of the use case **'admit patient'** with appropriate course of action.	**[Marks-5]**	
	c)	**Construct** an Activity Diagram for the use case **'admit patient'** following UML notation.	**[Marks-5]**	
2.	*a)*	**Elaborate** three levels of functional and two non-functional testing with examples.	**[Marks-5]**	**CLO-1** *Level-2*
	b)	**Estimate** the Cyclomatic complexity of the following flow chart. Verify your answer using Graph matrix theory. 	**[Marks-2]**	

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	c)	**Express** with proper terminology the various requirement engineering processes.	**[Marks-3]**	
3	*a)*	Consider the following project schedule with activity labels, durations (in weeks), and their respective precedents: **Activity** / **Duration (weeks)** / **Precedents** A / 7 / - B / 5 / - C / 3 / A D / 6 / B E / 4 / C, D F / 9 / E G / 4 / E H / 3 / F, G I / 1 / H **Convert** the given table into a Network Diagram and find the critical path showing the earliest start time (ES), earliest finish time (EF), latest start time (LS), latest finish time (LF).	**[Marks-7]**	**CLO-3** *Level-2*
	b)	**Elaborate** Software Cost Estimation with categories and the reason of using it.	**[Marks-3]**	
	c)	Consider a software project for a hospital management system. The software is designed to manage patient records, appointments, and billing. The Lines of Code (LOC) of major software functions identified are: • Patient registration • Appointment scheduling • Billing and invoicing For patient registration (LOC): S_{opt}: 2500, S_m : 3500, S_{pess}: 5500 For appointment scheduling(LOC): S_{opt}: 4200, S_m : 6300, S_{pess}: 8400 For billing and Invoicing (LOC): S_{opt}: 1800, S_m : 2400, S_{pess}: 4800 In this software project, the productivity rate is estimated at 4000 lines of code (LOC) per person-month, and the development cost is $6000 per person-month. **Compute** the following: i. Person required per month. ii. Total cost of the software development. iii. Cost per LOC.	**[Marks-5]**	