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Daffodil International University

Faculty of Science & Information Technology

Department of Software Engineering

Midterm Examination, Summer- 2026

Course Code: SE 312

Course Title: Software Quality Assurance & Testing

Sections & Teachers: (A,B-SA), (C-AUA), (D,E-QFF), (F-AJE), (G-FM), (H,I,J-SIM)

Time: 1 Hour 30 Min **Marks: 25**

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)*	An e-commerce application allows users to search for products, place orders, make payments, and track deliveries. During testing, the QA team discovers that some payment transactions fail during peak hours, discount calculations are sometimes incorrect, and product searches occasionally return inaccurate results. The team also notices that most defects are concentrated in the payment and checkout modules. Although many defects have been fixed, some users still complain that the application does not meet their expectations during flash sales. Based on the above scenario, identify and **Describe** four of the seven Principles of Software Testing. Justify your answers with relevant evidence from the scenario.	[Marks 5]	CLO-1 Level-2
	b)	A hospital wants to develop a patient appointment and emergency queue management system. The requirements are approved early because the hospital says the process is fixed. However, after development begins, doctors request a new priority rule for emergency patients, and the billing department asks for integration with an external payment service. **Answer the following:** **i) Describe** the V-Model as suitable for this project. Support your answer using details from the scenario. **[2]** **ii) Explain** V-Model diagram showing the major development phases and their corresponding testing phases. **[3]**	[Marks-5]	CLO-1 Level-2

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2	*a)*	A university grading system calculates a student's **Total Marks** using the following formula: **Total Marks = Midterm + Final Exam** The valid input ranges are: • Midterm: **0–30** • Final Exam: **0–70** The system should reject any value outside these ranges. **Answer the following:** **i)** Identify all the boundary values for each input field according to Boundary Value Analysis. **[2]** **ii) Illustrate** a compact but effective set of Boundary Value test cases for this system. Include test cases around the minimum and maximum limits of each input and calculate the expected Total Marks for each case. **[3]**	**[Marks-5]**	**CLO-2 Level-4**
	b)	A smart building security system controls access to a restricted laboratory. The system has four states: • **Locked** • **Unlocked** • **Alarmed** • **Permanently Blocked** Rules: 1. A valid access card unlocks the door only when the system is **Locked**. 2. An invalid card attempt increments a failure counter. 3. Three consecutive invalid card attempts trigger the **Alarmed** state. 4. While **Alarmed**, only a security officer can reset the system back to **Locked**. 5. If an invalid card is used while the system is **Alarmed**, the system becomes **Permanently Blocked**. 6. A valid card presented while **Alarmed** is ignored. 7. Once **Permanently Blocked**, no event can change the state. **Apply** State Transition Testing for this Scenario	**[Marks-5]**	**CLO-2 Level-4**
	c)	A course registration system checks three conditions before allowing registration: the student login must be valid, the registration fee must be paid, and seats must be available. If all three conditions are true, the system shows "Registration Successful." If the login is invalid, the system shows only "Invalid Login" and does not check or display fee/seat-related errors. If the login is valid but the fee is unpaid, the system shows "Payment Due Error." If the login is valid and the fee is paid but no seats are available, the system shows "Seat Full Error." If the login is valid but both fees are unpaid and seats are unavailable, the system shows both "Payment Due Error" and "Seat Full Error." Using Decision Table Testing, **Contrast** the complete decision table and write the expected output for each rule.	**[Marks-5]**	**CLO-2 Level-4**