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Daffodil International University

Department of Software Engineering

Faculty of Science & Information Technology

Midterm Examination , Summer 2025

Course Code: SE323; Course Title: Software Architecture & Design

Sections & Teachers: AE(A,B), FRR(C-E), ZZM(F,G),MMN(H),DDK(I)

Time: 1 Hour 30 Mins **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.]

You are a software architect assigned to design the **Rural Health Management System (RHMS)** for a government initiative aimed at improving healthcare accessibility in remote and rural areas. The system will support services such as: **Patient Registration and Medical Records, Telemedicine Consultations, Doctor and Health Worker Scheduling, Vaccination and Immunization Tracking, Mobile Health Unit Tracking, Health Awareness Notifications via SMS.** The system must operate in areas with **intermittent internet connectivity**, integrate with **national health databases**, and ensure **data security and patient privacy**. It should support both **online and offline functionalities**, with local caching and synchronization when connected. The architecture must allow **frequent updates, modular deployments**, and **interoperability** with other e-health systems. Both **web-based dashboards** for healthcare providers and **mobile applications** for field workers and patients will be needed.

1.	a) **Explain** the key architectural stakeholders involved in the RHMS development, with their concerns and how the architecture addresses them.	[Marks-5]	CLO-1 Level-2
	b) **Explain** how a broker architecture facilitates communication between distributed components in the RHMS system.	[Marks-6]	CLO-1 Level-2
2.	a) **Interpret** the different types of architectural structures and explain how each helps in system design.	[Marks-4]	CLO-2 Level-3
	b) Construct a 4+1 view model for the RHMS system and demonstrate each view with suitable examples from the scenario.	[Marks-5]	CLO-2 Level-3
3.	**Analyze** how layered architecture supports system organization, the risks posed by **layer bridging** and **sinkhole** anti-patterns, and **suggest strategies** to avoid these issues while ensuring scalability and maintainability with proper examples.	[Marks-5]	CLO-3 Level-4