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Daffodil International University
Department of Software Engineering
Quiz 1, Summer 2026, Section: 45 C
Course Code: SE223; Course Title: Database System

Marks- 15 40 min

Question 1: Daffodil International University uses an integrated portal called SmartEdu to manage academic operations through two major interfaces: the Teacher Portal and the Student Portal. In this system, each student is assigned a unique permanent Student_ID (e.g., 252-35-XXX). The system stores the student's NID_Number, Full_Name, Institutional_Email, and Current_CGPA. A group of students is assigned under the mentorship of a particular faculty member. Faculty members access the Teacher Portal using a unique Employee_ID. The system records each faculty member's Full_Name, Official_Email, Department_Code, and Phone_No. The university consists of several departments, each identified by a unique Dept_Code and Dept_Name. Courses are identified by a unique Course_Code (e.g., SE 223) and contain Course_Title and Credits. Each course belongs to a specific department. Before every semester (e.g., Summer 2026), the mentor reviews a student's previous academic result and registers the student into a particular course section taught by a specific teacher. The enrollment information is maintained by the system. After completion of the semester, the student's Marks and Final Alphanumeric Grade are recorded in the result section. Students can view their results through the Student Portal.

a) Identify the entities and design the relational schema for the SmartEdu system outlining attributes with their types, Pk, Fk and relations. (5 Marks)

b) Regarding the SmartEdu system explain the three levels of the DBMS Three-Schema (4 Marks)

c) Considering "Student" entity Identify the following Keys (3 Marks)

1. Super Key()
2. Candidate Key(s)
3. Primary Key
4. Foreign Key(s)
5. Unique Key(s)

d) Identify the best suited architecture for to implement Smart-Edu database and justify your answer (3 marks)

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