

II B.E. Examination June 2021
Information Technology
ITR4C4
Database Management System

21177

Duration: 3 hours

Maximum Marks: 60

Note: Attempt any two parts from each question. Take suitable assumptions wherever necessary. Attempt all part of a question in one place.

- Q.1(a)** Compare and contrast among 1-tier, 2-tier and 3-tier database architecture in DBMS. **6**
- (b)** Describe the database development life cycle with a neat sketch diagram. **6**
- (c)** Consider the following relations: **6**
- Doctor(SSN, FirstName, LastName, Specialty, YearsOfExperience, PhoneNum)
Patient(SSN, FirstName, LastName, Address, DOB, PrimaryDoctor_SSN)
Medicine(TradeName, UnitPrice, GenericFlag)
Prescription(Id, Date, Doctor_SSN, Patient_SSN)
Prescription_Medicine(Prescription Id, TradeName, NumOfUnits)
- Write SQL query for the following:
- List the first and last name of patients whose primary doctor named 'John Smith'.
 - List the first and last name of doctors who are not primary doctors to any patient.
 - For medicines written in more than 20 prescriptions, report the trade name and the total number of units prescribed.
 - List the SSN of patients who have 'Aspirin' and 'Vitamin' trade names in one prescription.
 - List the SSN of distinct patients who have 'Aspirin' prescribed to them by doctor named 'John Smith'.
 - List the trade name of generic medicine with unit price less than 50.
- Q.2(a)** Explain various constraints used in mysql with example. **6**
- (b)** Assume we have the following application that models soccer teams, the games they play, and the players in each team. In the design, we want to capture the following: **6**
- We have a set of teams, each team has an ID (unique identifier), name, main stadium, and to which city this team belongs.
 - Each team has many players, and each player belongs to one team. Each player has a

- Teams play matches, in each match there is a host team and a guest team. The match takes place in the stadium of the host team.
- For each match we need to keep track of the following:
 - o The date on which the game is played
 - o The final result of the match
 - o The players participated in the match. For each player, how many goals he scored, whether or not he took yellow card, and whether or not he took red card.
 - o During the match, one player may substitute another player. We want to capture this substitution and the time at which it took place.
- Each match has exactly three referees. For each referee we have an ID (unique identifier), name, DoB, years of experience. One referee is the main referee and the other two are assistant referee.

(c) Map the above ER diagram to a relational model using the mapping rules. Identify the relational model constraints applicable on it. 6

F: $A \rightarrow C$	G: $A \rightarrow CD$
$AC \rightarrow D$	$E \rightarrow H$
$E \rightarrow ED H$	

$$\begin{array}{lll} AB \rightarrow C & A \rightarrow DE & D \rightarrow IJ \\ B \rightarrow F & F \rightarrow GH & \end{array}$$

- Find the names of suppliers who supply some red part.
- Find the name of suppliers who supply some red or green part.
- Find the sids of suppliers who supply every red part.

(c) Compare and contrast among basic 2-PL, conservative 2-PL, strict 2-PL and rigorous 2-PL with example. 6

- Q.5(a)** What are the fundamental pillars of Database Security? **6**
- (b)** Differentiate between dynamic and extendible hashing. Also how would you insert following keys in a B+ tree with order $p = 3$. **6**
23, 65, 37, 60, 46, 92, 48, 71, 56, 59, 18, 21, 10, 74, 78, 15, 16, 20, 24, 28, 39
- (C)** Write Short Note on: **6**
(ii) Generic two-level data warehousing architecture
(iii) Data mining