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| **Q1 .Consider the following relation of course sections in Science College:**  **Course-Section**( CourseNo, SectionNo, Department, CreditHours, CourseLevel, InstructorSSN,  InstructorName, Semester, Year, Time, Room, NoofStudents )  **The following Functional Dependencies exist:**  **FD1:**CourseNo 🡪 Department, CreditHours, CourseLevel  **FD2:**CourseNo, SectionNo, Semester, Year 🡪 Room ,Time, NoofStudents, InstructorSSN  **FD3:**InstructorSSN 🡪 InstructorName   |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Course  No | Section  No | Department | Credit  Hours | Course  Level | Instructor  SSN | Instructor  Name | Semester | Year | Time | Room | No  Of  Students | | 222 | 11223 | IT | 2 | 4 | 482734 | Suad | 1st | 34-35 | 8-10 | 9 | 10 | | 101 | 34455 | CS | 3 | 1 | 288020 | Jawaher | 2nd | 35-36 | 9-11 | 3 | 27 | | 222 | 11223 | IT | 2 | 4 | 997089 | Mashael | 1st | 35-36 | 1-3 | 5 | 20 | | 244 | 89910 | IT | 2 | 7 | 482734 | Suad | 1st | 36-37 | 10-12 | 7 | 18 |  1. What normal form is the **Course-Section** relation in? Explain your answer? 2. What it the primary key(s) for this relation? 3. How would you normalize this relation to 3NF**?**   **Q2.** **Consider the following Production Company database schema, which keeps records of production machines, its operator and produced components. MachineNo and ComponenetNo make each product unique.**  **Production**( MachineNo, MachineType, OperatorName, { ComponenetNo, ComponentType } )  Normalize the above relation to the 3NF, showing appropriate dependency diagrams to justify decomposition  **Q3.Normalize the following database schema to the 3NF(show the FDs ):**  **Customer** ( Cust\_No, Cust\_Name, Cust\_phone#, Cust\_address, Cust\_City, {Registration\_date, Branch\_name, Branch\_address,Branch\_phone#, Branch\_manager\_Name,Branch\_Manager\_SSN, Branch\_manager\_sex} )  Note that the customer can register in many branches and date of registration is kept in database .Branch\_name is unique for each branch and each branch has one manager only (note: {} is a repeating group.)  **Q4: Given the following Theatre Database form: Produce the relations in the 3NF. Assume a play name is unique and the owner open one theater at most per year.**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **No.of seats**:500 | | | **Owner**: J.Martin | | | | **Year Founded**: 1890 | | | **Owner’s Phone**: 2347756 | | | | **Play Name** | **Play Type** | **No. of performances** | | **Play Author name** | **Play Author nationality** | | MacBeth | Tragedy | 35 | | W.shakesper | English | | Ulysses | Drama | 12 | | J.Joyce | Irish | | |