**SESSION**

**FEB/MAR 2021**

**PROGRAMME**

**MASTER OF COMPUTER APPLICATION (MCA)**

**SEMESTER**

**I**

**COURSE CODE & NAME**

**DCA6104 – ADAVANCED DATABASE MANAGEMENT SYSTEMS**

1. **Consider two tables named ‘Student’ and ‘Course’ as follows**

**Table: Student**

**(a) Find the Cartesian Product of Tables ‘Student’ and ‘Course’.**

**(b) What will be the result after the successful execution of the following Relational Algebra Expressions?**

**• σ age> 18(Student)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | | |  |
| **Reg-No** | **Name** | **Age** |
|  |  |  |
| **R1** | **A** | **18** |
| **R2** | **B** | **20** |
| **R3** | **C** | **19** |
| **R4** | **D** | **17** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table: Course** | | |  |
| **Course\_No** | **Course\_Name** | **Credits** |  |
| **DCA6104** | **ADBMS** | **4** |  |
| **DCA6103** | **CSA** | **3** |  |
| **DCA6101** | **Programing in C** | **4** |  |

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**Answer:**

**(a) Find the Cartesian Product of Tables ‘Student’ and ‘Course’.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Reg-No. | Name | Age | Course\_No | Course\_Name | Credits |
| R1 | A | 18 | DCA6104 | ADBMS | 4 |
| R1 | A | 18 | DCA6103 | CSA | 3 |
| R1 | A | 18 | DCA6101 | Programing in C | 4 |
| R2 | B | 20 | DCA6104 | ADBMS | 4 |
| R2 | B | 20 | DCA6103 | CSA | 3 |
| R2 | B | 20 | DCA6101 | Programing in C | 4 |
| R3 | C | 19 | DCA6104 | ADBMS | 4 |
| R3 | C | 19 | DCA6103 | CSA | 3 |
| R3 | C | 19 | DCA6101 | Programing in C | 4 |
| R4 | D | 17 | DCA6104 | ADBMS | 4 |
| R4 | D | 17 | DCA6103 | CSA | 3 |
| R4 | D | 17 | DCA6101 | Programing in C | 4 |

**(b) What will be the result after the successful execution of the following Relational Algebra Expressions?**

1. **• σ age> 18(Student)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Reg-No. | Name | | Age | | Course\_No | | Course\_Name | | | Credits |
| R2 | | B | | 20 | | DCA6104 | | ADBMS | 4 | |
| R2 | | B | | 20 | | DCA6103 | | CSA | 3 | |
| R2 | | B | | 20 | | DCA6101 | | Programing in C | 4 | |
| R3 | | C | | 19 | | DCA6104 | | ADBMS | 4 | |
| R3 | | C | | 19 | | DCA6103 | | CSA | 3 | |
| R3 | | C | | 19 | | DCA6101 | | Programing in C | 4 | |

1. **•** π**Name(σ age> 18(Student))**

|  |
| --- |
| B |
| C |

1. **What do you mean by Primary Key, Composite Key and Foreign Key Attributes/Fields? Explain by taking a suitable example of each.**

**Answer:**

**Primary Key**

PRIMARY KEY in [DBMS](https://www.guru99.com/dbms-tutorial.html) is a column or group of columns in a table that uniquely identify every row in that table. The Primary Key can't be a duplicate meaning the same value can't appear more than once in the table. A table cannot have more than one primary key.

**Rules for defining Primary key:**

* Two rows can't have the same primary key value

1. **Assume all the relations/tables as mentioned in Q1 are available for this question. Suppose we defined a new third relation named ‘ Registration’ as follows:**

|  |  |  |
| --- | --- | --- |
| **Table: Course** | | |
| **Course\_No** | **Course\_Name** | **Credits** |
| **DCA6104** | **ADBMS** | **4** |
| **DCA6103** | **CSA** | **3** |
| **DCA6101** | **Programing in C** | **4** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table: Registration** | | |  |
| **Reg-No** | **Course No** | **Room** |  |
| **R1** | **DCA6104** | **1** |  |
| **R1** | **DCA6103** | **2** |  |
| **R2** | **DCA6104** | **1** |  |
| **R2** | **DCA6103** | **2** |  |

**Explain all forms of ‘join’ operator (such as ‘natural join’, ‘left outer join’ , ‘ right outer join’ and ‘full outer join’) of Relational Algebra using ‘Registration’ and ‘Course’ tables/relations as examples.**

**Answer:**

**1. Natural Join:**

Natural Join joins two tables based on same attribute name and datatypes. The resulting table will contain all the attributes of both the table but keep only one copy of each common column.