Total Marks - 20

Note – Attempt any four questions. Each question has equal weightage (5 marks).

Ques1. Explain the following terms – Databases, DBMS and Relational Database. What is data independence and why is that necessary?

Ques2. Consider the below tables – runners and races.

```
sql> SELECT * FROM runners;          sql> SELECT * FROM races;
+----+-------------+                  +----+---------------+-----------+
| id | name        |                  | id | event         | winner_id |
+----+-------------+                  +----+---------------+-----------+
| 1 | John Doe     |                  | 1 | 100 meter dash | 2        |
| 2 | Jane Doe     |                  | 2 | 500 meter dash | 3        |
| 3 | Alice Jones  |                  | 3 | cross-country  | 2        |
| 4 | Bobby Louis  |                  | 4 | triathalon     | NULL     |
| 5 | Lisa Romero  |                  +----+---------------+-----------+
+----+-------------+
```

    a. Let's assume, we run the below query on top of these two tables,

```
SELECT * FROM runners WHERE id NOT IN (SELECT winner_id FROM races)
```

Write the output of this query. Is there any issue with this query? If yes, how would you approach to fix that issue?

    b. What happens if set resulting from NOT IN condition has null value in it?

Ques3. Let us assume that we have an employee table with more than 10 records. Write a SQL query to find the 10th highest employee salary from an employee table. Explain your answer.

Ques4. Table Name: - Employee

Empid	EmpName	Department	ContactNo	EmailId	EmpHeadId
101	Isha	E-101	1234567890	isha@gmail.com	105
102	Priya	E-104	1234567890	priya@yahoo.com	103
103	Neha	E-101	1234567890	neha@gmail.com	101
104	Rahul	E-102	1234567890	rahul@yahoo.com	105
105	Abhishek	E-101	1234567890	abhishek@gmail.com	102

Write schema for the above table. Write a query to fetch the record of all the employees whose name starts with 'P'.

Ques5. What is ER diagram? Draw the ER diagram for BHU Cultural Events Database. Ensure that you must have different types of attribute and entities in it. Specifically mention which attribute you will consider as primary key.