

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth semester B.Tech examinations (S), September 2020

Course Code: CS208**Course Name: PRINCIPLES OF DATABASE DESIGN (CS, IT)**

Max. Marks: 100

Duration: 3 Hours

Limit answers to the required points.**PART A*****Answer all questions, each carries 3 marks.***

Marks

- | | | |
|---|---|-----|
| 1 | Illustrate three schema architecture with a suitable diagram. | (3) |
| 2 | With a help of an example, elaborate weak entity set and strong entity set. | (3) |
| 3 | Differentiate DDL and DML with suitable example. | (3) |
| 4 | With suitable example, define integrity constraint? | (3) |

PART B***Answer any two full questions, each carries 9 marks.***

- | | | |
|---|--|-----|
| 5 | Design an ER diagram for the given scenario; | (9) |
|---|--|-----|

Suppose that you are designing a schema to record information about reality shows on TV. Your database needs to record the following information:

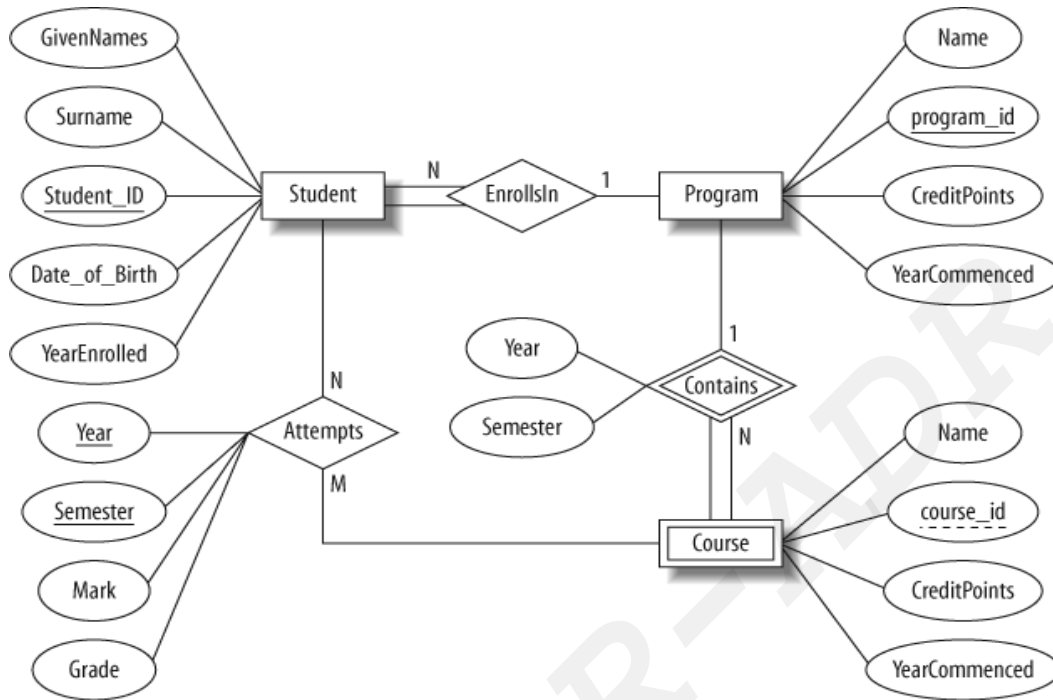
_ For each reality show, its name, genre, basic_info and participants name. Any reality show has at least two or more participants.

- For each producer, the company name, company country. A show is produced by exactly one producer. And one producer produces exactly one show.

- For each television, its name, start year, head office. A television may broadcasts multiple shows. Each show is broadcasted by exactly one television.

-For each user, his/her username, password, and age. A user may rate multiple shows, and a show may be rated by multiple users. Each rating has a score of 0 to 10.

6 Covert the following ER Model to Relational Model (9)



7 a) Differentiate Natural join, Equi-join and Left outer join (3)

7 b) Consider the schema given below. (6)

- employee (person-name, street, city)
- works (person-name, company-name, salary)
- company (company-name, city)
- manages (person-name, manager-name)

Write relational algebra queries for the following questions

- a. Find the names and cities of residence of all employees who work for First Bank Corporation.
- b. Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than \$10,000 per annum.
- c. Find the names of all employees in this database who live in the same city as the company for which they work.

PART C

Answer all questions, each carries 3 marks.

8 With suitable example, list aggregate functions in sql (3)

9 What is the importance of views in sql? Explain with suitable example. (3)

10 Illustrate different anomalies in designing a database. (3)

11 How can we conclude two FDs are equivalent? (3)

PART D

Answer any two full questions, each carries 9 marks.

- 12 a) Consider the schema given below. (9)

person (driver-id, name, address)

car (reg-no, model, year, driver-id)

accident (report-number, date, location)

participated (driver-id, reg-no, report-number, damage-amount)

Write SQL queries for the following

a. Find the name of driver, who is drives the car with reg-no='AABB2000'. Find the total number of people who were involved in car accidents in 01-01-1989.

c. Find the number of accidents in which the cars belonging to "John Smith" were involved.

d. Update the damage amount for the car with reg-no "AABB2000" in the accident with report number "AR2197" to \$3000.

- 13 a) Compute the closure of the following set F of functional dependencies for relation (3)

schema $R = (A, B, C, D, E)$.

$A \rightarrow BC$

$CD \rightarrow E$

$B \rightarrow D$

$E \rightarrow A$

List the candidate keys for R.

- b) Define 3NF and BCNF. Let $R (A, B, C, D, E)$ be a relational schema in which the (6)
following functional dependencies are known to hold: $AB \rightarrow C$, $C \rightarrow E$ and $E \rightarrow D$. Identify the highest normal form

- 14 a) Illustrate triggers with a suitable example. (4)

- b) $R = (A, B, C, D, E)$. We decompose it into $R_1 = (A, B, C)$, $R_2 = (C, D, E)$. The set (5)
of functional dependencies is: $A \rightarrow BC$, $CD \rightarrow E$, $B \rightarrow D$, $E \rightarrow A$. Check whether this decomposition is a lossless join decomposition or not.

PART E

Answer any four full questions, each carries 10 marks.

- 15 a) Compare primary indexing, secondary indexing and clustered indexing with (6)
suitable diagram.

- b) Define the structure of B+ tree (4)

- 16 a) Database system implementers have paid much more attention to the ACID properties than have file-system implementers. Why might this be the case? (6)
- b) Explain deferred database modification with an example. (4)
- 17 a) Consider a file with 450000 records . Each record size is 125 bytes and block is 1000 bytes. The primary key of the file is 10 bytes and record pointer size is 6 bytes. (10)
- 1) Calculate number of index block required in case of primary indexing
- 2) Calculate number of index blocks required in case of multilevel indexing.
- 18 a) Differentiate serial and concurrent schedules. Elaborate Conflict serializability with suitable example. (6)
- b) Illustrate two phase locking (4)
- 19 a) Why recovery is needed in transaction processing (5)
- b) Illustrate heuristic query optimization with suitable example. (5)
- 20 a) Write short notes on (10)
- 1) Big Data
- 2) Biological Database
- 3) GIS
