

Grade 10 | Database | Essay Paper

1. The XYZ Sports is a shop that sells sports items which are supplied to the shop by several suppliers. The shop maintains a database with three tables to store the items currently in stock, their suppliers and items purchased from the suppliers, as shown below. (2015)

Item Table

ItemID	IName	Stock
P01	Football	15
P02	Bat	25
P03	Netball	18
P04	Volleyball	10

Supplier Table

SuppID	SName	Phone
S01	Nuwan	1234567
S02	Rita	5678123
S03	Akram	5566113
S04	Kumari	8877221

Purchase Table

Date	SuppID	ItemID	Count
11/8	S01	P03	40
12/9	S03	P03	15
13/9	S02	P01	20
14/9	S04	P02	30
16/9	S03	P04	20

- (i) List two primary key fields and their table names in the above database system.
- (ii) The shop decides to add a new item 'Tennis ball' and purchases 30 of them from the supplier Rita on the date 22/9.
- (a) What table(s) need(s) to be updated for this event?
- (b) Write down the new record(s) in the relevant table(s).
- (iii) A customer buys one Volleyball and one Bat.
- (a) What table(s) need(s) to be updated for this event?
- (b) Write down the updated record(s) in the relevant table(s).
2. A school band has a collection of instruments and they are lent to students who do not have instruments but want to be part of the school band. The school band maintains a database to manage the lending of instruments to the students. The database contains tables as given below. (2016)

Instrument Table

I_ID	Instrument	Received_date
1001	Trumpet	01/01/2015
1002	Clarinet	01/01/2015
1003	Trumpet	01/06/2015

Student Table

S_ID	Name	Grade
S004	Nuwan	8
S005	Kumara	9

Borrowing Table

Date	I_ID	S_ID
01/01/2016	1003	S004
01/03/2016	1002	S005
01/03/2016	1003	S004

- (i) List two primary key fields and their respective table names in the above database.
- (ii) The school band received a donation of two new Drums on 2nd of December 2016.
- (a) What table(s) need(s) to be updated in the database?
- (b) Write down the updated row(s) of the table(s) in the database.
- (iii) Saman joins the band on the 8th of December 2016 and borrows a Trumpet on the same day.
- (a) What table(s) need(s) to be updated in the database?
- (b) Write down the updated row(s) of the table(s) in the database.
3. Assume that the following database tables are used to calculate the electricity bills. The same rate is used to complete the bill of a given customer. (2017)

Customer_Data_Table

Name	Acc_No	Type
A.B. Silva	1001	R
V. Balasingham	1002	C
S.S. Gamage	1003	R
R.T. Alles	1004	C

Rate Table

Type	Rate
R	10.50
C	18.50

Usage Table

Month	Acc_No	Units
January	1001	185
February	1001	280
January	1002	165
May	1003	270

- (i) Write two primary keys and their corresponding tables.
- (ii) Write two foreign keys and their corresponding tables.
- (iii) What would be the most suitable table in the database to add the field customer_address?
- (iv) What tables should be updated if a new customer called A.B.C Navaz of type R has used 120 units for the month of April?
- (v) Write down the updated rows and their respective table names for the updates given (iv) above. (Assume that Acc_No is 1005.)
- (vi) What tables should be joined to run a query to find out the total bill for A.B. Silva for January?

4. Consider the Employee and Division tables given below. (2018)

Employee Table

Emp_Name	Emp_ID	Designation	Div_ID
Saman Perera	E1	Manager	...P...
Raj Selvam	E2	Engineer	...Q...
John Allison	E3	ICT Officer	...R...
Fazal Khan	E4	Accountant	...S...

Division table

Division_Name	Division_Number	Division_Location
Finance	1	Colombo 1
Stores	2	Colombo 2
Sales	3	Colombo 3

- (a) Assume that a new division named IT located in Colombo 3 is to be added. Write down the new record that has to be added and the corresponding table name.

(b) Saman and John work at Stores. Fazal works at Finance Division. Raj recently joined the IT Division. Write down the correct values for labels **P - S** in Employee table to represent this information.

5. Assume that the following is a part of the relational database of a business information system. This business has shops in certain schools in different parts of the country. (2018)

Sales Table

Month	ShopID	Sales
January	001	12400
Match	001	18700
December	003	15330
February	001	11230
March	002	16330

Category Table

Category	Items
A	Ice Cream & Milk
B	Milk
C	Milk & Stationary

Branch Table

Name	ShopID	Category
ABC College	001	A
PQR Central College	002	B
XYZ College	003	C

- Write down two primary keys and their respective table names.
 - Write down two foreign keys and their respective table names.
 - What table should be modified to include the telephone number of each shop?
 - Which tables should be joined to run a query to find out the total sales at ABC College?
 - Assume that a new shop with ShopID 004 selling Milk & Photocopying services is opened at HIJ College. What tables need to be updated to include the given information?
 - Write down the newly added records as specified in (v) above along with the respective table names.
6. Consider the following database table listing monthly sales and commission of sales representatives: (2019)

Month	SalesRepID	TotalSales	Commission
January	1	Rs. 10,000	Rs. 100
January	2	Rs. 20,000	Rs. 200
February	1	Rs. 5,000	Rs. 50
February	2	Rs. 15,000	Rs. 150

Note: In the above table, SalesRepID represents the identifier of the sales representative.

- Which two fields should be chosen to make the primary key of the above table?
- Write down the most suitable data type for the:
 - Month Field
 - TotalSales Field

7. Following are the partly shown tables of the relational database of a sports team management system in a school. (2019)

PlayerID	FirstName	LastName	StudentID
P1001	Saman	Perera	S1538
P1002	Raj	Selvam	S1201
P1003	Sharaf	Nazwar	S2735
P1004	Saman	Silva	S1465
P1005	Shane	Almaida	S2905
P1006	Nimal	Fernando	S1350

Table: Player (Includes the descriptive of players)

Table: Player_Team (Contains the player of each team and their years of joining)

TeamID	PlayerID	YearJoined
T1	P1002	2013
T1	P1004	2014
T2	P1003	2015
T2	P1005	2015
T3	P1001	2014
T3	P1006	2013

Table: Team (Contains the names and age categories of teams and their captains)

TeamID	TeamName	AgeGroup	CaptainID
T1	Cricket	U19	P1002
T2	Cricket	U17	P1003
T3	Volleyball	U19	P1002
T4	Volleyball	U17	P1004

(Note: CaptainID is a valid PlayerID)

- (i)
 - (a) Write down the primary key of the Team table?
 - (b) Write down the possible primary keys available in the Player table.
 - (ii) Which table(s) need(s) to be updated to accommodate the following changes?
 - (a) A new student, Piyal Alwis (StudentID: S4205), is admitted to the school and joins the U17 Cricket team in 2019.
 - (b) Nimal Fernando is appointed the captain of the U19 Volleyball team.
 - (iii)
 - (a) Write down the new record(s) to be added to the relevant table(s) for the change mentioned in part (ii) (a). Use the format: tablename → (field1, field2, ...) for each record.
(Note: Assume that Piyal Alwis is assigned the PlayerID P1120)
 - (b) In 2019, the school starts an Under 17 (U17) Football team (TeamID: T7) and appoints Shane Almaida as the captain. Write down the new record(s) to be added to the relevant table(s) for the above change. Use the format: tablename (field1, field2, ..) for each record.
(Note that Shane Almaida is currently playing in the U17 Cricket team.)
 - (iv) Which tables are to be joined to write a query to find the name of the U17 Cricket captain?
8. Consider the partly shown Purchase database table listing the purchase date and quantities of different items purchased by different suppliers: (2020)

SupplierID	ItemID	PurchaseDate	Quantity
S001	1001	02/05/2020	30
S002	1002	05/03/2020	40
S003	1005	25/11/2020	25
S002	1007	05/03/2020	20
S004	1001	12/04/2020	45

SupplierID– Identification number of the Supplier
ItemID –Identification number of the Item
PurchaseDate– Date of purchasing
Quantity – Number of items purchased

- (a) Write down the number of fields and records in the above table.
(b) Write down the most suitable data types for PurchaseDate and Quantity.

9. Following are the partly shown relational database tables that are used to store information about supervisors, projects, and the projects supervised by supervisors in a University. (2020)

Table: Supervisor

SupervisorID	FirstName	LastName	DepartmentName
S01	Anil	Priyantha	Computer Science
S02	Mohamed	Nazwar	Chemistry
S03	Raj	Selvam	Physics
S04	Anura	Wijenayake	Computer Science
S05	Keerthi	Nanayakkara	Mathematics

Table: Project

ProjectID	StartDate
P001	05/03/2019
P002	05/03/2019
P003	05/03/2019
P004	05/03/2018
P005	10/04/2020

Table: Supervisor_Project

SupervisorID	ProjectID	Allowance
S01	P003	20,000
S02	P002	10,000
S02	P001	15,000
S04	P001	10,000
S03	P004	12,000

- (i) State whether the following statements are TRUE or FALSE.
(a) SupervisorID is a foreign key of Supervisor_Project table.
(b) ProjectID is the primary key of Supervisor_Project table.
- (ii) Which table(s) need(s) to be updated to accommodate the following changes?
(a) Anura Wijenayake is assigned as a Supervisor for the project P002 with an allowance of 10,000.
(b) A new supervisor, Pradeep Dissanayake (SupervisorID: S06) joined the Department of Chemistry and was assigned as a supervisor for an ongoing project (ProjectID: P003) with an allowance of 15,000.
- (iii) On 15/09/2020, the University started a new project (ProjectID: P006) with Mohamed Nazwar and Raj Selvam as supervisors. An amount of 11,000 is allocated for each supervisor. Write down the new record(s) to be added to the relevant table(s) for the above change. Use the format tablename → (field1, field2, ..) for each record.
- (iv) What are the most appropriate tables to be joined to write a query to find the Department name(s) of the supervisor(s) who supervise(s) the project P001?

10. Write down two advantages of computerized Database Management Systems (DBMS). (2021)
11. Following are the partly shown database tables that are used to store details about food items, purchases and suppliers of a school canteen. The canteen sells food items which are purchased from the suppliers.

Table: Item

(Contains data of the items available in the canteen with their selling prices in Rupees.) (2021)

Item_ID	Item_Name	Selling_Price
F001	Tea bun	40
F002	Fish roll	70
F003	Chicken roll	65
F004	Vegetable roll	60

Table: Purchase

(Contains data of the purchasing prices of items from different suppliers. Note that a particular food item can be purchased from many suppliers for different prices.)

Item_ID	Supplier_ID	Purchasing_Price
F001	S007	30
F001	S004	35
F003	S001	60
F004	S004	55

Table: Supplier

(Contains data about suppliers.)

Supplier_ID	Supplier_Name	Supplier_Location
S001	Saman	Maradana
S002	Raj	Borella
S003	Sharaf	Dematagoda
S004	Shane	Maradana

- i.
 - a) Write down the primary key of the Purchase table.
 - b) Write down the foreign keys in the Purchase table.
- ii. Which tables need to be updated to accommodate the following?
 - a) The supplier S004 changes his location (Supplier_Location) to Rajagiriya.
 - b) The canteen decides to increase the selling price of a fish roll to 80 Rupees due to a 10 Rupee price increase by the supplier.
- iii. A new supplier Kamal (Supplier_ID: S008) from Wellawatte starts supplying vegetable rolls to the school canteen for 50 rupees. Write down the new record(s) to be added to the relevant table(s) for the above change. Use the tablename > (field1, field2, ...) format for each new record.
- iv. What are the appropriate tables to be joined to write a query to find the names of the suppliers who supply fish rolls to the canteen?