Solutions & Marking Scheme

SHORT ANSWERS (10 MARKS)

1. The relation Medicine (Name & price) contains the titles and prices of different Medicines. Please note that no two medicines have the same price, what does the following SQL query list? **(CO4: 1 Marks)**

   select name from medicine as M

   where (select count(*) from medicine as MD where M.price>MD.price) <5;

   Ans. Name of the five most expensive medicine

   1 mark for correct answer, otherwise 0

2. A driver can drive three types of cars and a car can be driven by any qualified pilot. What will be the cardinality (use MIN-MAX notation) of this driver to car relationship? **(CO2: 1 Marks)**

   Ans. N:3

   1 mark for correct answer, otherwise 0

3. The responsibilities of a database administrator include designing ER Model. True or False? **(CO1: 1 Marks)**

   Ans. False

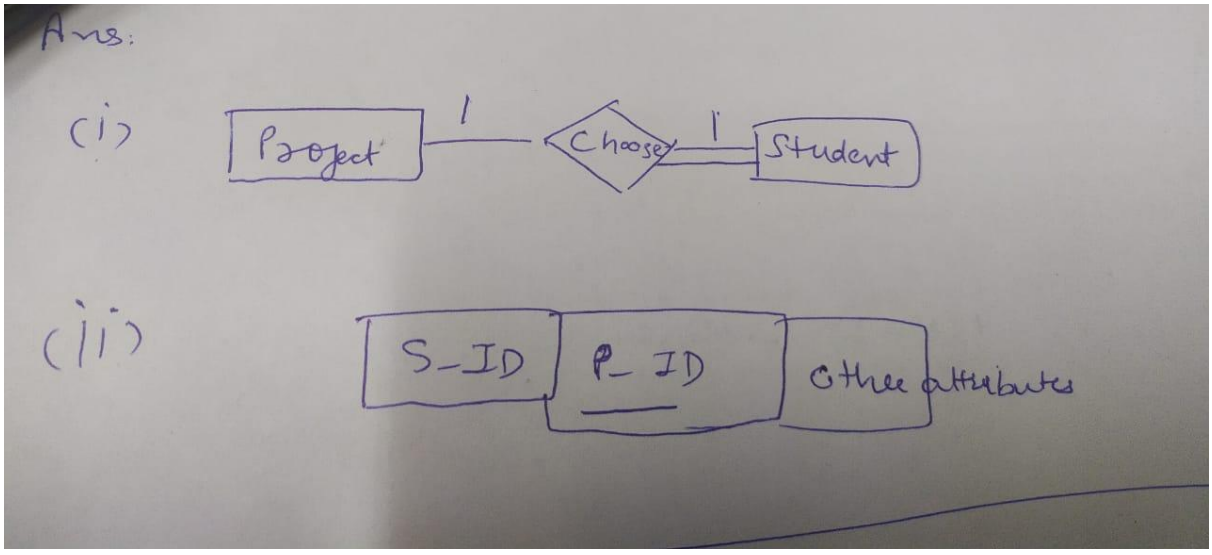
   1 mark for correct answer, otherwise 0

4. Department of CSE floats a list of projects. The students must choose only one project from the list. However, two students cannot select the same project. **(CO2: 2 Marks)**

   (i) What will be cardinality and participation constraint of different entities in the system.
   1 mark for correct answer, otherwise 0

   (ii) How many relations will be required to represent the system? Represent the relational schema.
   1 mark for correct answer, otherwise 0

   Ans:



5. Consider a table Student which has 10 records and a not null and unique column MARKS.
   What will be the output of the following query? JUSTIFY.
   Select count(*) from student where marks > any(select marks from student);
   (CO4: 1.5 Marks)

   A
   ns. ANY compares a value with each of the values in a list or results from a query and evaluates to true if the result of an inner query contains at least one row. Among these 10 records one of the records will be minimum which cannot be greater than any nine values of the marks column. Hence the condition where marks > any(select marks from student) will be true nine times. So, the COUNT(*) outputs 9.
   1 mark for correct answer and 0.5 for explanation

6. Data independence is the basic concept of database systems using which an application program may be developed independent of data. True or False?
   (CO1: 1 Marks)
   Ans. False

   1 mark for correct answer, otherwise 0

7. Consider two tables with following values.
   T1(Eno: 1,2,3,5) & T2(Sid: 1,2,4)
   What will be the output of the following query? **(CO4: 1 Marks)**

Select T1.Eno, T2.Sid from T1 FULL OUTER JOIN T2 ON T1.Eno=T2.Sid;

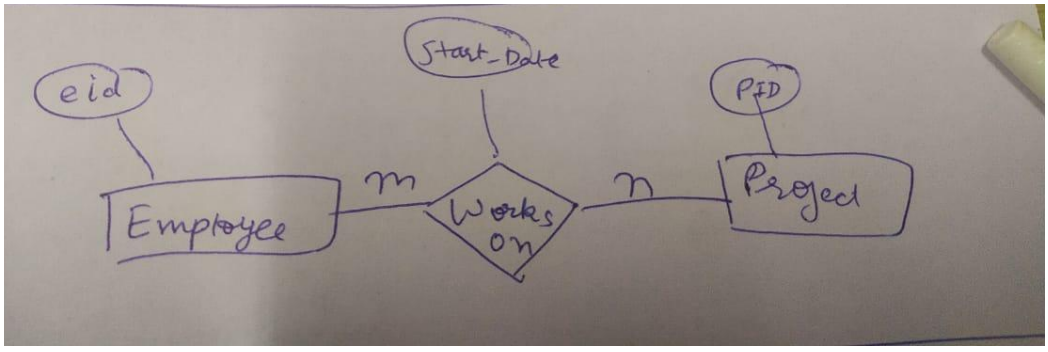
ANS.

Col_1	Col_2
1	1
2	2
NULL	4
3	NULL
5	NULL

1 mark for correct answer, otherwise 0

8. Draw the ER diagram corresponding to the following relational model with all constraints. **(CO2: 1.5 Marks)**
   Employee(eid, ename, ephone)
   Project (pid, pname)
   WorksOn(eid,pid,start_date)

Ans:



0.5 for identifying Employee, 0.5 for Works on and 0.5 for Project

LONG ANSWERS (10 MARKS)

Q.1 Consider the database of PhD Scholar registered at JIIT Noida **(CO4: 5 Marks)**

PhD_Scholar (scholar_id, scholar_name, major, PhD_level, scholar_age)
Course (course_name, meeting_at, room, sid)
Registered (scholar_id, course_name)
Supervisor (sid, supervisor_name, dept_name)

Write SQL for following:

1) Print the course_name of all courses with meeting at room number G8 or have 10 or more PhD Scholars registered. **(1 Marks)**
2) For each Supervisor who takes courses only in room number 'G9', display supervisor name and the total number of courses taught by supervisor. **(1.5 Marks)**
3) Display the Scholar names of all initial level scholars (level = IL) who are registered in a course taken by Prof John. **(1 Marks)**
4) Print the name of all PhD Scholars who are registered in two courses that meet at the same time. **(1.5 Marks)**

Solution

1) **SELECT Course_name FROM Course WHERE room = 'G8' OR Course_Name IN (SELECT Registered.Course_Name FROM Registered GROUP BY Registered.course_name HAVING COUNT (*) >= 10).**

2) **SELECT Supervisor_name, COUNT(*) AS CourseCount FROM Supervisor, Course WHERE Supervisor.sid = Course.sid GROUP BY sid, Supervisor_name HAVING EVERY (Course.room = 'G9')**

3) **SELECT DISTINCT P.scholar_name FROM Phd_Scholar P, Course C, Registered R, Supervisor S WHERE P.scholar_id = R.scholar_id AND R.course_name = C.course_anme AND C.sid = S.sid AND S.supervisor_name= 'Prof John' AND P.level = 'IL'**

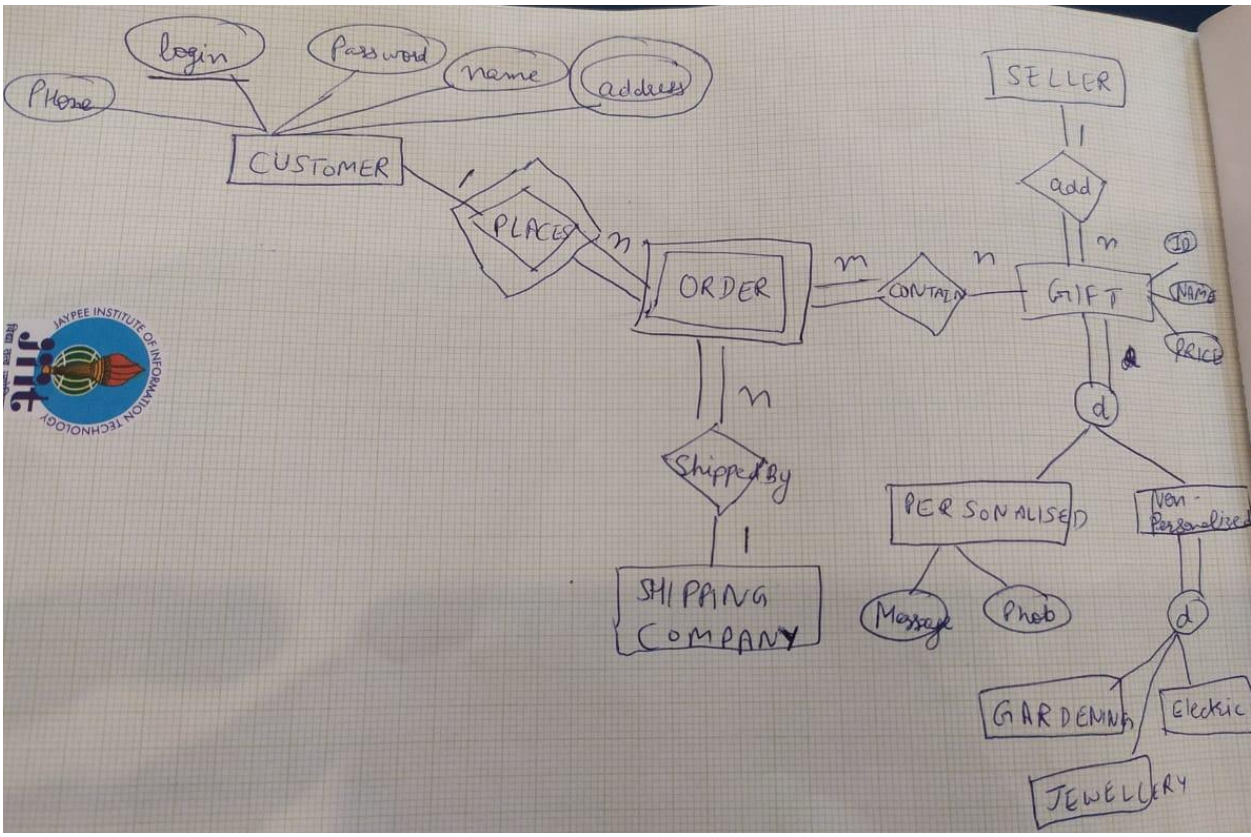
4) **SELECT DISTINCT P.scholar_name FROM PhD_Scholar P WHERE P.scholar_id IN (SELECT R1.scholar_id FROM Registered R1, Registered R2, Course C1, Course C2 WHERE R1.scholar_id = R2.scholar_id AND R1.course_name <> R2.course_name AND R1.course_name = C1.course_name AND R2.course_name = C2.course_name AND C1.meeting_at = C2.meeting_at)**

Q2. You are given a task to design database for an online gift store. Following are the requirements which need to be captured: **(CO2: 5 Marks)**

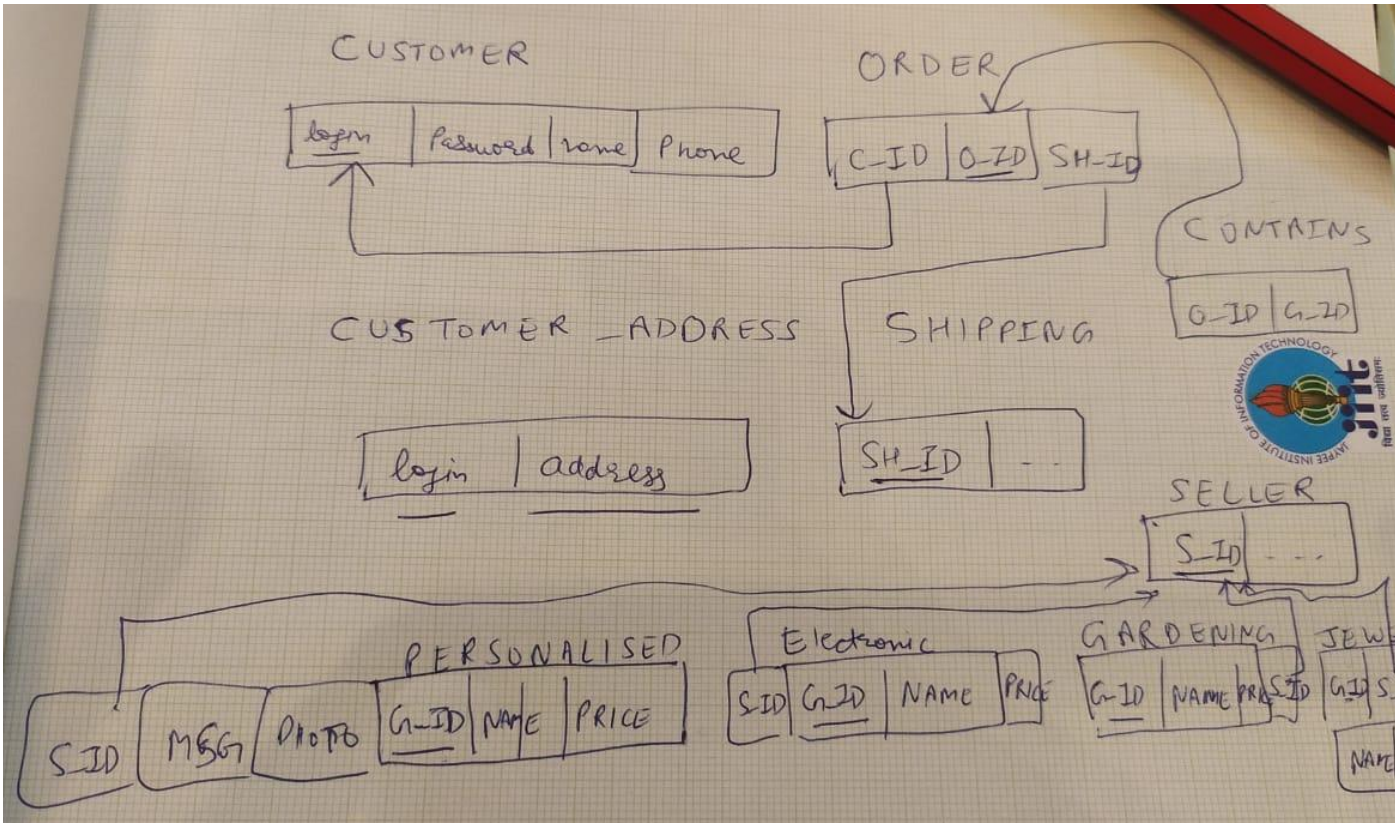
- Customers has login_id, password, name, address (multiple addresses), phone.
- Seller can add gifts into system with attributes id, name, price.
- The gift can be personalised or non-personalised. Personalised gift can have attributes such as: personalised message, photograph etc.
- Further, non-personalised gift can be categorised as electronic, jewellery or gardening.
- Customer can place order with multiple gifts.
- Order is shipped by shipping company.

(i) Draw the EER diagram.

2.5 mark for entities, cardinality and participation constraint



(ii) Map ER diagram into Relational model.
2.5 Marks


CUSTOMER
login
Password
name
Phone
ORDER
C_ID
O_ID
SH_ID
CONTAINS
O_ID
G_ID
CUSTOMER_ADDRESS
login
address
SHIPPING
SH_ID
SELLER
S_ID
PERSONALISED
S_ID
MSG
PHOTO
G_ID
NAME
PRICE
Electronic
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