



UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program : Fifth Semester – Fall 2021

Paper: Database Systems (CMP)

Course Code: IT-304

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 Roll No.

 Time: 3 Hrs. Marks: 60

Q.1. Answers the following short questions: (6x5=30)

- i. What is data independence and what are different types of data independence?
- ii. What is database integrity and how it can be enforced?
- iii. What are the limitations of hierarchical data model?
- iv. What is data independence and what are different types of data independence?
- v. What is database integrity and how it can be enforced?
- vi. What are the limitations of hierarchical data model?

Answers the following questions. (3x10=30)

Q.2.

Draw ER Model for the following situation:

A university has many faculties such as faculty of science, faculty of commerce, faculty of law etc. A faculty operates many departments, but each department is operated by only one faculty. A department has many teachers and many students. Only one of the teachers chairs the department. Each department offers many degree programs. Each degree program comprises many courses and the same course may be offered in multiple degree programs of a department. Each degree program has one degree supervisor. Many classes are scheduled for the same course. A class is taught by one teacher and a teacher can teach up to three classes. A student may enroll in several classes (up to 6) and each class has up to 35 students.

Q.3.

Normalize the following “Customer_Order” relation up to 3rd Normal form step by step. You must specify the definition, functional dependencies and each intermediate resultant table with every Normal Form.

ORD ID	ORD Date	CUST ID	CUST Name	CUST Address	ITEM ID	ITEM Name	ITEM Qty	ITEM price
605	14/03/2021	C 101	Naveed	Lahore	1	Scanner	50	15000
605	14/03/2021	C 101	Naveed	Lahore	2	Mouse	100	500
605	14/03/2021	C 101	Naveed	Lahore	3	Printer	40	18000
606	15/03/2021	C 102	Amjad	Quetta	2	Mouse	50	500
606	15/03/2021	C 102	Amjad	Quetta	4	Monitor	40	12000

Q.4.

Consider the following tables to answer the queries:

EMP (EMPNO, ENAME, JOB, SAL, HIREDATE, COMM, MGR, DEPTNO)

DEPT (DEPTNO, DNAME, LOC)

- a) List all CLERKs with SAL between 4000 and 6000.
- b) How many SELSMAN are working in the organization?
- c) Display (EmpNo, EName, Job, Salary, DeptNo, DeptName)
- d) Name of the employee getting maximum salary.
- e) List the average salary of each job for deptno 10 or 20 for the jobs with average salary greater than 1500. Sort the output with respect to average salary.