

University of the Punjab
Elective Computer Studies course for B.A/B.Sc. Examination 2005

Paper B

Time Allowed: 3 hours

Notes:

1. *Question 1 in Part I and Question 7 in Part II are compulsory*
2. *Attempt all the remaining questions in Part I and Part II, Selecting either part (a) or part (b) of each question but not both.*

Part-I (Data Base Management Systems)

Max Marks: 35

Q.1 (Do all parts in this question)

(10 Marks)

Note: Answers for all the parts in question 1 must be written on the answer sheet. Write on the answer sheet the part number and your answer(T or F) against it. No need to write the question on the answer sheet.

1. NOT NULL is a constraint can apply both at the column level and table level. (T / F)
2. If table T has five attributes and only one attribute is served as Candidate Key then other four attributes are known as alternate keys. (T / F)
3. We use Outer joins statement to display rows that would not normally meet the equi-join condition. (T / F)
4. Index automatically created for Foreign Keys. (T / F)
5. Snapshot is an object contains no data but store definition in the Data Dictionary. (T / F)
6. We can only use 25 sub queries at most in one Main Query. (T / F)
7. We cannot use No Cyclic option for Primary Keys in Sequence. (T / F)
8. Super key is such a candidate key, which does not have the Irreducibility property. (T / F)
9. ODBC stands for open database connectivity Collection (T / F)
10. Composite Primary Key is unique key (T / F)

Q.2 (Do either part (a) or part (b) of this question

(5 Marks)

(a))An analyst has selected the following Attributes of a Company. Apply INF to 3NF (step by step) to design an efficient DB Design without Data redundancy or Duplication.

OrdID	OrdDate	CustId	CustName	ProdId	ProdName	Quantity	InvId	InvDate	InvAmount
1	1_jan_05	10	alia	100	box	5	IN1	1_jan_05	17
				200	pen	1			
				300	box	10			
2	2_jan_05	20	ayesha	200	bat	10	IN2	3_jan_05	30
				300	Dice	10			
3	4_Jan_05	10	salma	100	pen	5	IN3	6_jan_05	13
				200	bat	4			

OR

- (b)
(b1) Differentiate between 3NF and 2NF (1+1)

Q.3 (Do either part (a) or part (b) of this question (5 Marks)

- (a)
(a1) Differentiate reliability and security with respect to RDBMS. Explain with examples (3.5 + 1.5)

OR

- (b)
(b1) Differentiate between Database Administration and Data Administration (2.5+2.5)

Q.4 (Do either part (a) or part (b) of this question (5 Marks)

- (a)
(a1) Write down the Components of DBMS? (2)
(a2) Define terms Domain, Candidate key (1.5 + 1.5)

OR

- (b)
The following tables form part of database held in relational DBMS:

Student (studentNO, studentName,city)

Course (courseNo, studentNo, type, price)

Booking (studentNO,guestNo,datefrom,dateto,courseNo)

Guest (TeacherNo,TeacherName,TeacherAddress)

Where all underlined letter are primary keys,

Please identify possible

(b1) Foreign Keys (1)

(b2) Composite keys (2)

In above mentioned schemas

Q.5 (Do either part (a) or part (b) of this question (5 Marks)

- (a) Draw an ERD for the Given CASE STUDY

OR

- (b) Draw the possible schemas (tables, attributes, keys) Given CASE STUDY

CASE STUDY

- A supplier may send many shipments
- Each shipment is supplied by single supplier
- A customer may have many invoices
- Each invoice must be for one customer.
- A supplier may supply many products
- Each product supplied by at least one supplier or any no of suppliers
- A customer may receive many payments
- Each payment is required to be generated to one customer
- An invoice must contain at least one item to be sold but one sold item is included in one invoice only

- One product may be involved as one item to be sold or any number of items to be sold but one sold item will be only one product.

Q.6 (Do either part (a) or part (b) of this question (5 Marks)

(a)

Express the following natural language queries in SQL for the Given Software Engineering Case study and Definition in the form of Ms Access

(a1) List all skills with a charging rate greater than 100 Pounds per hour, in alphabetical order of description. (2.5)

(a2) List all staff with the skill description 'Programmer' who work in the 'Special Projects' department. (2.5)

OR

(b)

(b1) Write a short note on ODBC. Explain with example (3+2)

Software Engineering Case Study

Consider a software engineering company that takes on projects and uses its staff to carry out these projects. Each member of staff has one strong skill. The company has a payment scheme for the set of skills its staff have. A project has a unique project manager. The following definitions exist in the database (the name of the relations and attributes are self explanatory): Definition

```
CREATE TABLE Staff (
    Staff_no      INT,
    Name          VARCHAR(30),
    Department    VARCHAR(20),
    Skill_code    CHAR(5),
    PRIMARY KEY  (Staff_no),
    FOREIGN KEY  (Skill_code) REFERENCES Skill_payment );
CREATE TABLE Skill_payment (
    Skill_code    CHAR(5),
    Description   VARCHAR(80),
    Charging_rate INT,          -- Pounds per hour
    PRIMARY KEY  (Skill_code) );
CREATE TABLE Project (
    Project_no    INT,
    Start_date    DATE,
    End_date      DATE,
    Budget        INT,
    Manager       INT,
    PRIMARY KEY  (Project_no),
    FOREIGN KEY  (Manager) REFERENCES Staff(Staff_no) );
CREATE TABLE Allocation (
    Staff_no      INT,
    Project_no    INT,
    Date_worked_on DATE,
    Hours         INT,
    PRIMARY KEY  (Staff_no, Project_no, Date_worked_on),
```

Q.7 (Do all parts in this question)

(10 Marks)

Note: Answers for all the parts in question 7 must be written on the answer sheet. Write on the answer sheet the part number and your answer against it. No need to write the question on the answer sheet.

Part A

1. A device used to convert analog data into digital signals.
a) codec b) LAN card c) telephone d) modem
2. To digitize analog data, which encoding technique is used
a) pulse code modulation b) amplitude modulation
c) frequency modulation d) phase modulation
3. Which of the following function is performed at network layer?
a) logical addressing b) routing c) both a & b d) none of them
4. _____ device is used in digital transmission to regenerate the signals.
a) amplifier b) repeater c) multiplexer d) modem
5. In the _____ layer, the data unit is called segment.
a) physical b) data link c) network d) transport

Part B

1. Which of the following is false about Multiprogrammed system
(a) It increases CPU utilization by switching between the jobs like which is in execution and requires I/O and the other which is ready to run.
(b) It increases CPU utilization as more than one job is using processor simultaneously.
(c) It increases CPU utilization by switching between the jobs like which is in execution and requires I/O and the other which is in Job pool.
(d) All jobs present on the Hard disk are brought to the memory.
2. Which of the following paradigm provides more user interaction
a. Desktop systems
b. Batch system
c. Multiprogrammed system
d. Time sharing system
3. A process needs certain resources to complete. Which of the following is not a resource
(a) Memory
(b) Data cable
(c) CPU
(d) I/O Devices
4. _____ ensures that a process can execute that a process only with in its own address space
(a) Protection
(b) Memory addressing hardware
(c) System call
(d) Addressing bar

5. Which of the following is not present in PCB

- (a) Process time (b) Stack
(c) Memory limit (d) Memory Management Information

Q.8 Do either part (a) or part (b) of this question (5 Marks)

- (a) Write a note on the following topics
(a1) single relocateable partition (2)
(a2) multi partitions (3)

OR

- (b) What do you we mean by?
(b1) swapping (2)
(b2)overlying (3)

Q.9 Do either part (a) or part (b) of this question (5 Marks)

(a) Explain the following terms with respect to networking:

- (a1) authentication(1)
(a2) correction (2)
(a3) detection (2)

OR

(b) What is multitasking (multiprocessing or multiprogramming)? Describe the difference between co-operative multitasking and pre-emptive multitasking.

Q.10 (Do either part (a) or part (b) of this question (5 Marks)

- (a) (a1) Briefly Explain WAN (2.5)
(a2) Define Circuit Switching (2.5)

OR

- (b) Difference between Serial Transmission and Parallel Transmission
(2.5.+2.5)

Q.11 Do either part (a) or part (b) of this question (5 Marks)

(a) What is the difference between the following?
Sender and Receiver (2.5+2.5)

OR

- (b) Write a short note on Star Topology (5)

Q.12 (Do either part (a) or part (b) of this question (5 Marks)

(a) Briefly explain the functions of the following layers of OSI Model:

- (a1) Application Layer (2.5)
(a2) Transport Layer (2.5)

OR

- (b) Write a short note on Full duplex (5)