

Section A

[40 marks]

Answer ALL questions in this section.

A1. Briefly describe the following terms in the context of database. [10]

- (a) Primary key
- (b) Multi value attribute
- (c) Weak entity
- (d) Entity
- (e) Ternary relationship

A2. State **TWO** features for a 'Primary key'. [2]

A3. What are the differences between a centralized database, a distributed database and a client-server database? [6]

A4. (a) What is relationship? [1]

(b) Draw entity relationship diagrams to represent the following types of relationships: [3]

- Unary relationship
- Binary relationship, and
- Ternary relationship

- A5.** Display all the subject name and department from the Subject Table. Concatenate both columns to become a single column and rename the header as Subject-Department. You need to add some literals. See example below. [5]

Subject-Department

Information Systems subject belongs to Computer Science.
The Diversity of Life subject belongs to Computer Science.
....
...

- A6.** Identify **THREE** types of data model. [3]
- A7.** List any **FOUR** types of JOIN and differentiate between them. [4]
- A8.** What are the characteristics of database approach? [3]
- A9.** Briefly describe the **THREE** components of the relational data model. [3]

Section B

[60 marks]

Answer ANY TWO questions in this section.

B1.

[30 marks]

- (a) Answer the following questions, based on the table below. Table name is STUDENT.

Student_ID	Student_Name	Subject_ID	Enrol_Date	Mark
9400074	Jason	CS1200	12-DEC-2008	90
9200020	Thomas	MA4545	05-SEP-2008	65
9875620	Leslie	CS1200	29-JUL-2007	48
8745520	Ben	CS8794	19-AUG-2008	69
9841220	Wendy	MA1235	15-AUG-2007	85

- (i) List the student name and their ID of the students who joined in year 2008. [4]
- (ii) Write the SELECT statement to display the student name, and Subject ID for the students who enrolled during Aug 2007 to Aug 2008. You have to use the BETWEEN...AND operator. [6]
- (iii) Write the SELECT statement to find out who scored higher marks than Wendy from the Student table. The output will display the Student name and their Mark. You have to use Sub query. [7]

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- (b) The tables ORDER and CUSTOMER consist of the following attributes:

Order Table

Data Name	Data Type	Data Length
ORDER_ID	Numeric	5
ORDER_DATE	Date	
CUST_ID	Character	4

Customer Table

Data Name	Data Type	Data Length
CUST_ID	Character	4
CUST_NAME	Character	15
CUST_ADDRESS	Character	30
CUST_TEL	Numeric	9

Using the above tables, write SQL statements to retrieve the following information:

- (i) Show the names of the customer who have placed ORDERS before 15-JUN-2006. [4]
- (ii) Show the names of the customer who have placed ORDERS and arrange the output by customer name. [3]
- (iii) Write a SQL command to remove the ORDER table. [1]
- (iv) Write a SQL command to insert a new ORDER with ORDER ID 10000 where DATE is 15-SEP-2006 and CUST_ID is A222. [2]
- (v) Write a SQL command to change CUST_NAME "JANE" to "MARY". [3]

B2.

[30 marks]

- (a) Explain the **THREE** levels of a DBMS architecture. [6]
- (b) Show the output after the manipulation from the following single-row functions. [5]
- (i) Round(9.455,1)
 - (ii) Round(27.432, 0)
 - (iii) Mod(155,3)
 - (iv) Mid ('Dip Computer Studies ', 5,8)
 - (v) Len ('Bye')
- (c) Write a SQL statement that displays the result of the calculation '*add 5 to 219 and multiply the result by 15*'. [3]
- (d) Fill in the symbol or operator next to the description. [9]

Description	Symbol or operator
(i) Represent One character	
(ii) Represent any single character	
(iii) Return TRUE if both component conditions are TRUE	
(iv) Return TRUE if either component conditions are TRUE	
(v) Return TRUE if the following condition is FALSE	
(vi) Between 2 value (inclusive)	
(vii) Match any of a list of values	
(viii) Match a character pattern	
(ix) Is a null value	

- (e) Display today's date and change the header to TODAY from a table TEST. [3]
- (f) Explain the meaning of Cartesian Product. [2]
- (g) Define NULL. [2]

B3.

[30 marks]

The following table forms part of a database held in a relational DBMS:

Hotel (Hotel_No, Name, City)

Room (Room_No, Hotel_No, Type, Price)

Booking (Hotel_No, Guest_No, Date_From, Date_To, Room_No)

Guest (Guest_No, Name, Address)

Hotel contains hotel details and Hotel_No is the primary key. Room contains room details for each hotel and has (Hotel_No, Room_No) is the primary key.

Assuming the above, give SQL statements to retrieve the following information:

- (a) Full details of all hotels located at Singapore. [2]
- (b) The average price of different types of room. [3]
- (c) The total number of guests. [2]
- (d) The number of guests who have made bookings after 31-DEC-07. Assume that guests do not make simultaneous bookings for more than one hotel. [4]
- (e) Provide **EIGHT** benefits of using Database Approach as compare to using file processing approach. [8]
- (f) Define the terms:
 - (i) Logical data independence [1]
 - (ii) Physical data independence. [1]

- (g) Re-write the following statement using the IN operator. [3]

```
SELECT robotname  
FROM robottable  
WHERE robotname = 'R2D2'  
OR robotname = 'C3PO'
```

- (h) Write an SQL statement to display the warranty date which is six months from the date of purchase using a table called Purchases. The date of purchase can be obtained from the column named purchase_date in the table. [6]

-END OF PAPER-