



UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF INFORMATION TECHNOLOGY

FINAL EXAMINATION
JANUARY 2016 SEMESTER

COURSE CODE : ICB 20503
COURSE NAME : DATABASE MANAGEMENT SYSTEMS
PROGRAMME NAME : BACHELOR
(FOR MPU: PROGRAMME LEVEL)
DATE : 29 MAY 2016
TIME : 2.00 pm – 4.30 pm
DURATION : 2 HOURS 30 MINUTES

INSTRUCTIONS TO CANDIDATES

1. Please **CAREFULLY** read the instructions given in the question paper.
2. This question paper has information printed on both sides of the paper.
3. This question paper consists of **ONE (1) section ONLY; Section A.**
4. Answer **ALL** questions in Section A.
5. Please write your answers on the answer booklet provided.
6. Answer all questions in English language **ONLY**.

THERE ARE 7 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

SECTION A (Total: 100 marks)

INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

Question 1

Given the following FLIGHT relation, answer the following questions in the order given consecutively:

member_no	booking_no	member_name	depart	arrive	ticket_type	discount	cumulative_point
10101	BZ10001	Ali	Kuala Lumpur	Bandung	Adult	0	123
11020	BZ10002	Bella	Kuala Lumpur	Bandung	Child	50	90
20101	QP01011	Cathy	Kuala Lumpur	Manila	Adult	0	235
20102	QP01012	Dan	Kuala Lumpur	Manila	Child	50	223
311333	HH03033	Eleane	Hanoi	Phnom Penh	Adult	0	310

Normalize the FLIGHT relation into:

- (a) First Normal Form. Draw its dependency diagram and identify all dependencies, including all partial and transitive dependencies.

(10 marks)

- (b) Second Normal Form.

(7 marks)

- (c) Third Normal Form.

(8 marks)

Question 2

(a) Kingdom Consulting (KC) is an IT consulting company in Kuala Lumpur. Kingdom Consulting (KC) receives a lot of IT project ranging from medium to large size. This different range of project requires a number of employees to be assigned to it within a specific duration. The following is the scenario of the company database:

- KC is organized into different departments. Each department has a name, number and an employee who manages the department. KC will keep track of the start date of the department manager.
- Each department controls a number of projects. Each project has a name, number and is sometimes located at multiple locations.
- KC also stores each employee's number, employee name and employee address comprises of street, city, postcode and state. Each employee works for one department but may work on several projects. KC also keeps track the number of hours per week that an employee currently works on each project. Each employee may have a number of dependents. For each dependent, KC will stores their name, gender, date of birth and relationship to employee.

With reference to the above mentioned scenario, create an *Entity Relationship Diagram* (ERD) that captures the information about Kingdom Consulting system. Be certain to indicate identifiers and cardinality constraints.

(20 marks)

(b) Draw an *Extended Entity Relationship (EER)* diagram of the conceptual schema for the following description of a University database as follows. Be certain to identify specialization of hierarchy and its constraint.

- Academic staff, general staff and students are *the only persons* at the university.
- Each person is *either* an academic staff, or a general staff, or a student.
- A person is uniquely identified by a PerId (person's ID), and has a Name, and an Address. An Address is composed of HouseNo, Street, and City.
- A characteristic property of a student is that she/he has at least one Major and one NoOfPts (number of points) for each major.
- An academic staff has a Position and an AcQual (academic qualification).
- A general staff has a GenPos (general position).

(5 marks)

Question 3

Structured Query Language (SQL) is a tool for organizing, managing and retrieving data stored in a database. It consists of about 40 basic commands.

- (a) Distinguish the difference between Data Definition Language (DDL) and Data Manipulation Language (DML). (4 marks)
- (b) Give TWO (2) examples of SQL command for each DDL and DML. (4 marks)
- (c) Consider the following two tables :

Table 1 : Employee

Column Name	Data Type	Constraint
EmpNo	Number(4)	Primary Key
EName	Varchar(25)	Not Null
Job	Varchar(20)	
Manager	Varchar(25)	
Salary	Number(9,2)	
DeptNo	Number(2)	References Department(DeptNo)

Table 2 : Department

Column Name	Data Type	Constraint
DeptNo	Number(2)	Primary Key
DName	Varchar(20)	Not Null
Location	Varchar(20)	

With reference to the above tables, write SQL commands for the following questions :

- i. Create the above two tables (along with the appropriate constraints). (6 marks)
- ii. Modify Employee table and add new column *Allowance* with data type Number(5,2). (2 marks)

- iii. Insert the list of records below for Employee and Department table.

Table : Employee

EmpNo	EName	Job	Manager	Salary	Allowance	DeptNo
1234	Ali	Registrar	Rizal	5,000.00	150.00	20
2345	Chin	Technician	David	3,000.00	250.00	30
3456	Sam	Engineer	Linda	7,500.00	400.00	10

Table : Department

DeptNo	DName	Location
10	Human Resource	Kuala Lumpur
20	IT	Shah Alam
30	Urban Planning	Kuala Lumpur

(6 marks)

- iv. Display table format/structure for Employee and Department.

(2 marks)

- v. Delete table named Department.

(1 mark)

Question 4

Observe the following tables :

Table 1 : Employee

EmpNo	EName	Job	Manager	Salary	Allowance	DeptNo
1234	Ali	Registrar	Rizal	5,000.00	150.00	20
2345	Chin	Technician	David	3,000.00	250.00	30
3456	Sam	Engineer	Linda	7,500.00	400.00	10

Table 2 : Department

DeptNo	Dname	Location
10	Human Resource	Kuala Lumpur
20	IT	Shah Alam
30	Urban Planning	Kuala Lumpur

With reference to the above tables, answer the following questions :

- (a) Write SQL command to select all record(s) in Employee table group by department number in ascending order format. (3 marks)
- (b) Write SQL command to display the employee names and their department. (2 marks)
- (c) From question 4(b) above, show the output. (2 marks)
- (d) Write SQL command to find out the number of employees in the table. (1 mark)
- (e) Based on question 4(d) above, how many students are there in the table ? (1 mark)
- (f) Write SQL command to produce the following output :

EName	Job	DName	Location
-----	-----	-----	-----
Sam	Engineer	Urban Planning	Kuala Lumpur
Ali	Registrar	Human Resource	Kuala Lumpur
Chin	Technician	IT	Shah Alam

(3 marks)

(g) Write SQL command to display the output shown below :

Name	Allowance
-----	-----
Sam	400.00

(2 marks)

(h) How to write SQL command to find record for the lowest allowance ?

(2 marks)

(i) Write SQL command to calculate the average allowance.

(2 marks)

(j) How to write SQL command to return the number of records which location is in Kuala Lumpur ?

(3 marks)

(k) Write SQL command to sum all salaries in Employee table.

(1 mark)

(l) Write SQL command to return record as followings :

Location	Salary
-----	-----
Kuala Lumpur	10,500.00
Shah Alam	5,000.00

(3 marks)

END OF EXAMINATION PAPER