MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2019/2020

TIS3351 – Advanced Database

(All sections / Groups)

22nd OCTOBER 2019
2.30 pm – 4.30 pm
(2 hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 7 pages, including the cover page, with four questions only.

2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please write all your answers in the answer booklet provided.

Question 1 [10 marks]

A data warehouse is created to record the occupancy of hotel room for Happy Legacy Hotel. The table below shows some sample records in the fact table.

Fact Table – ROOM_OCCUPANCY

TimeID	HotelID	RoomID	Occupied_Status	Total_Charge
11/10/19	M800	C1001	Yes	200
11/10/19	M800	C1002	No	0
14/10/19	B001	C1002	Yes	450
16/10/19	B003	C1004	No	0
18/11/19	M999	C1005	No	0
19/11/19	B002	C1006	Yes	300

a) Based on the fact table given above, draw **star schema** for the data warehouse, including the dimension tables. Include all the appropriate attributes in the dimension tables.

[4 marks]

b) From the star schema that you have constructed in (a), identify possible attribute that might contain attribute hierarchy. [1 mark]

c) Write the SQL extension for OnLine Analytical Processing (OLAP) using GROUP BY ROLLUP to display total charges per month by hotel by room type.

[3 marks]

d) Explain any TWO differences between fact and dimension tables. [2 marks]

Continued...

Question 2 [10 marks]

a) "Distributed Database Management System (DDBMS) has a common property of allowing the end user to believe that he or she is working with a centralised database management system".
Discuss the above statement with regard to **Distribution Transparency.** [2 marks]

b) Suppose that we have a relation
Employee (**EmpID**, EmpName, EmpSalary, EmpDOB, EmpDept, EmpPosition)

which is then partitioned as
Emp1 (**EmpID**, EmpName, EmpSalary)
Emp2 (**EmpID**, EmpDOB, EmpDept, EmpPosition)

where Emp1 is stored at site B, and Emp2 is stored at site C.

Answer the following questions:

i) A query at site A wants the names of all managers in the accounting department whose salary is greater than RM10,000. Write the SQL command to retrieve the query. [2 marks]

ii) Determine whether the query in (i) is remote request, remote transaction, distributed transaction or distributed request.
Justify your answer. [2 marks]

c) Draw the object representation for the following business rules: *Each supplier may supply many parts. Each part may be supplied by many suppliers.* [2 marks]

Continued...

d) Draw the temporal relation for *Production_log* based on the following: Suppliers are identified by *SuppID*, Parts are identified by *PartID*, while the number of quantity supplied are indicated in integer.

- On 5th February, Supplier S1003 supplied Part P1001 for 20 quantities, and Part P1002 for 30 quantities.
- From 8th February to 10th February, Supplier S1001 supplied Part P1001 for 30 quantities daily.

[2 marks]

Question 3 [10 marks]

a) Answer Questions a(i) to a(iv) based on the XML document below.

```
<?xml version="1.0">
<PartList>
      <Part>
            <ProdID>B001-05</ProdID>
            <Name>CPU</Name>
            <Qty>1</Qty>
            <Price>3999.99</Price>
      </Part>
      <Part>
            <ProdID>B002-02</ProdID>
            <Name>Speaker</Name>
            <Qty>2</Qty>
      </Part>
</PartList>
```

i. Convert the following XML document into Part table.

[2 marks]

Continued...

ii. Write a SQL statement to create a table named *Product*. The table should contain the following fields and data types. The Part field is the Part document specified in Question (a).

[2 marks]

Field	Data Type
ProductID	int
ProductName	varchar(50)
Part	xml

iii. Express the query to retrieve all products where the name is "CPU" as an XPath query.

[1 mark]

iv. Write a SQL statement to display the ProductID that has the Part with the Price greater than 3,500.

[2 marks]

b. What is the purpose of schema in the context of database administration and security? Show an example of SQL command on how a schema can be created and bind to a table.

[3 marks]

Question 4 [10 marks]

a) Give any ONE example of NoSQL database.

[1 mark]

Continued...

b) Indicate whether each following sentence or statement is TRUE or FALSE.

(i) NoSQL is a non-relational Database Management System, that does not require a fixed schema.

(ii) NoSQL database is used mainly for handling humongous unstructured data.

[2 marks]

c) Suppose you have a collection of **GameListing** as follows in the MongoDB database. Answer Question c(i) to c(iv) based on the collection.

```
{
 "_id" : ObjectId("71c423e85441587g5f54edb23"),
 "group_name" : "Supermind",
 "group_form_date" : "2019-09-09",
  "score" : [
    "30",
    "25",
    "33"
  ]
}
{
 "_id" : ObjectId("42c675d85441387d6b54edf67"),
 "group_name" : "Power",
 "group_form_date" : "2019-04-12",
  "score" : [
    "10",
    "22"
  ]
}
```

i. Write a NoSQL command to find the group with the name "Power".

[1 mark]

ii. Write a NoSQL command to count the number of scores possessed by each group.

[2 marks]

Continued...

iii. Write a NoSQL command to count the number of groups in a collection.
[2 marks]

iv. Write a NoSQL command to get the group name and total score for each group.
[2 marks]

End of Page.