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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2016/2017**

COURSE NAME : DATABASE **TERBUKA**
COURSE CODE : BIC 21404
PROGRAMME CODE : BIS / BIP / BIW / BIM
EXAMINATION DATE : JUNE 2017
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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Q1 (a) State **FIVE (5)** properties of a database relation. (5 marks)

(b) Identify **FIVE (5)** attributes for *Employee* relation. (5 marks)

Q2 (a) Name **FIVE (5)** computer-based security controls for a multi-user environment. (5 marks)

(b) Describe the security measures provided by Oracle Database Management System (DBMS). (5 marks)



Q3 (a) Differentiate between Online Analytical Processing (OLAP) and Data Mining. (3 marks)

(b) Answer **Q3(b)(i)** and **Q3(b)(ii)** based on the information in **Figure Q3(b)**.

HomeLand was a property management company that help owners who wish to rent out their property. This company also helps customers who want to rent a property for a certain period. *HomeLand* is categorized under retail and marketing applications.

Figure Q3(b)

(i) Identify **TWO (2)** examples of OLAP applications for *HomeLand* business area. (2 marks)

(ii) Suggest **TWO (2)** examples of the data mining in retail and marketing applications that could be mostly applied within *HomeLand*. (5 marks)

- Q4** (a) Describe the difference between the *WHERE* and *HAVING* clauses in SQL. (5 marks)
- (b) Construct SQL statement for **Q4(b)(i) – Q4(iv)** based on schema table in **Figure Q4(b)**.

The following tables form part of a database held in a relational DBMS:-

```
Hotel (hotelNo, hotelName, city)
Room (roomNo, hotelNo, type, price)
Booking (hotelNo, guestNo, dateFrom, dateTo, roomNo)
Guest (guestNo, guestName, guestAddress)
```

Figure Q4(b)

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- (i) List all double rooms (D) or family rooms (F) with a price below RM100 per night, in ascending order of price. Double room is denoted by 'D', and family room is denoted by 'F'. (3 marks)
- (ii) Find the total revenue per night from all double rooms. (3 marks)
- (iii) List the price and type of all rooms. (4 marks)
- (iv) Find total different guests which have made bookings for August. (5 marks)

Q5 (a) Draw an Entity Relationship Diagram (ERD) for each of the information in **Q5(a)(i)** - **Q5(a)(iii)**.

(i) The University might need to record which teachers taught which subjects in which courses. (3 marks)

(ii) At the University, each Teacher can teach an unspecified maximum number of subjects as long as his/her weekly hours do not exceed 24 hours. Teachers may teach 0 subjects if they are involved in non-teaching projects. (4 marks)

(iii) Consider a university database for the scheduling of classrooms for final exams. This database could be modeled as the single entity set exam, with attributes course-name, section-number, room-number, and time. Alternatively, one or more additional entity sets could be defined, along with relationship sets to replace some of the attributes of the exam entity set, as course with attributes name, department, and c-number. Section with attributes s-number and enrollment, and dependent as a weak entity set on course. Room with attributes r-number, capacity, and building. (8 marks)

(b) Propose the Initial Study phase activities of Database Life Cycle (DBLC) to build a proper database system based on information in **Figure Q5(b)**.

The Savvy Car Service & Repair Centers are owned by the car dealer. This company provides car services and repairs. Three centres of Savvy Company provide service and repair for the entire state. Each of the three centers is independently managed and operated by a shop manager, a receptionist, and at least eight mechanics. Each centre maintains a fully stocked parts inventory. Each centre also maintains a manual file system in which each car's maintenance history is kept: repairs made, parts used, costs, service dates, owner, and so on. Files are also kept to track inventory, purchasing, billing, employees' hours, and payroll.

Figure Q5(b)

(5 marks)

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Q6 (a) Answer Q6(a)(i) - Q6(a)(iii) based on information in Figure Q6(a).

An agency supplies temporary staff to hotels throughout Malaysia. **Table 1** lists the time spent by agency staff working at two hotels. The National Insurance Number (NIN) is unique for employee.

Table 1: Employee Data

NIN	contractNo	HoursPerWeek	sName	hotelNo	hotelLocation
850312WF	C1024	16	Siti Eman	H25	Johor
831211BG	C1024	24	Reen Sari	H25	Johor
871025RH	C1025	28	Soo Chi	H4	Melaka
850312WF	C1025	16	Siti Eman	H4	Melaka

Figure Q6(a)

- (i) Provide examples of insertion, and deletion anomalies. (4 marks)
 - (ii) Identify all dependencies by using dependency diagram for **Table 1**. (6 marks)
 - (iii) Normalize the relation into Second Normal Form (2NF) and Third Normal Form (3NF). (15 marks)
- (b) Discuss how normalization technique can be used to check the structure of the tables created from the ER model. (5 marks)



-END OF QUESTION -