1. Module number	*SET08120/SET08420*
2. Module title	*Database Systems*
3. Module leader	*Taoxin Peng*
4. Tutor with responsibility for this Assessment Student's first point of contact	*Taoxin Peng*
5. Assessment	*SQL - Guesthouse*
6. Weighting	*50%*
7. Size and/or time limits for assessment	*Section 1 – up to 70 points* *Five (of 15) problems to be attempted.* *1-5 attract a maximum of 7 points each* *6-10 attract a maximum of 10 points each* *11-15 attract a maximum of 14 points each* *Section 2 – up to 30 points*
8. Deadline of submission	*Hand in to Moodle by 2355 on 23 Nov 2018*
9. Arrangements for submission	*Answers to all sections in a single document.* *The section 1 answers should include SQL queries and the output generated.* *SQL code should be formatted using a fixed-width font.*
10. Assessment Regulations All assessments are subject to the University Regulations**.**	
11. The requirements for the assessment	
12. Special instructions	
13. Return of work	*You will receive feedback via Moodle.*
14. Assessment criteria	*You will be assessed on the accuracy and the quality of your code.*

Section One - SELECT Statements (70 points)

The guesthouse database is available in MySQL format from http://sqlzoo.net/guesthouse.sql. You may find the additional table **calendar** useful for some of the harder questions. The **calendar** table can be accessed through SQLzoo and is included in the downloadable schema script. The ER diagram for the database can be found at the end of this document.

SQL Questions – Choose any **five** questions to answer. Questions 1 – 5 are worth 7 marks each, 6 – 10 are worth 10 marks each, and 11 – 15 are worth 14 marks each.

1 **Guest 1183.** Give the booking_date and the number of nights for guest 1183.

2 **When do they get here?** List the arrival time and the name for all guests due to arrive on 5th Nov 2016, order the output by time of arrival.

3 **Look up daily rates.** Give the daily rate that should be paid for bookings with ids 5152, 5165, 5154 and 5295. Include booking id, room type, number of occupants and the amount.

4 **Who's in 101?** Find who is staying in room 101 on 3rd Dec 2016, include first name, last name and address.

5 **How many bookings, how many nights?** For guests 1185 and 1270 show the number of bookings made and the total number of nights. Your output should include the guest id and the total number of bookings and the total number of nights.

6 **Ruth Cadbury.** Show the total amount payable by guest Ruth Cadbury for her room bookings. You should JOIN to the rate table using room_type_requested and occupants.

7 **Including Extras.** Calculate the total bill for booking 5346 including extras.

8 **Edinburgh Residents**. For every guest who has the word "Edinburgh" in their address show the total number of nights booked. Be sure to include 0 for those guests who have never had a booking. Show last name, first name, address and number of nights. Order by last name then first name.

9 **How busy are we?** For each day of the week beginning 2016-11-25 show the number of bookings starting that day. Be sure to show all the days of the week in the correct order.

10 **How many guests?** Show the number of guests in the hotel on the night of 21st Nov 2016. Include all occupants who checked in that day but not those who checked out.

11 **Coincidence**. Have two guests with the same surname ever stayed in the hotel at the same time? Show the last name and both first names. Do not include duplicates.

12 **Check out per floor**. The first digit of the room number indicates the floor – e.g. room 201 is on the 2nd floor. For each day of the week beginning 14th Nov 2016 show how many rooms are being vacated that day by floor number. Show all days in the correct order.

13 **Free rooms?** List the rooms that are free on the day 25th Nov 2016.

14 **Single room for three nights required**. A customer wants a single room for three consecutive nights. Find the first available date in December 2016.

15 **Gross income by week**. Money is collected from guests when they leave. For each Thursday in November and December 2016 show the total amount of money collected from the previous Friday to that day inclusive.

Section 2 – Database Design (30 points)

You are required to extend the guest house system so that payments may be recorded.

The following facilities are required:

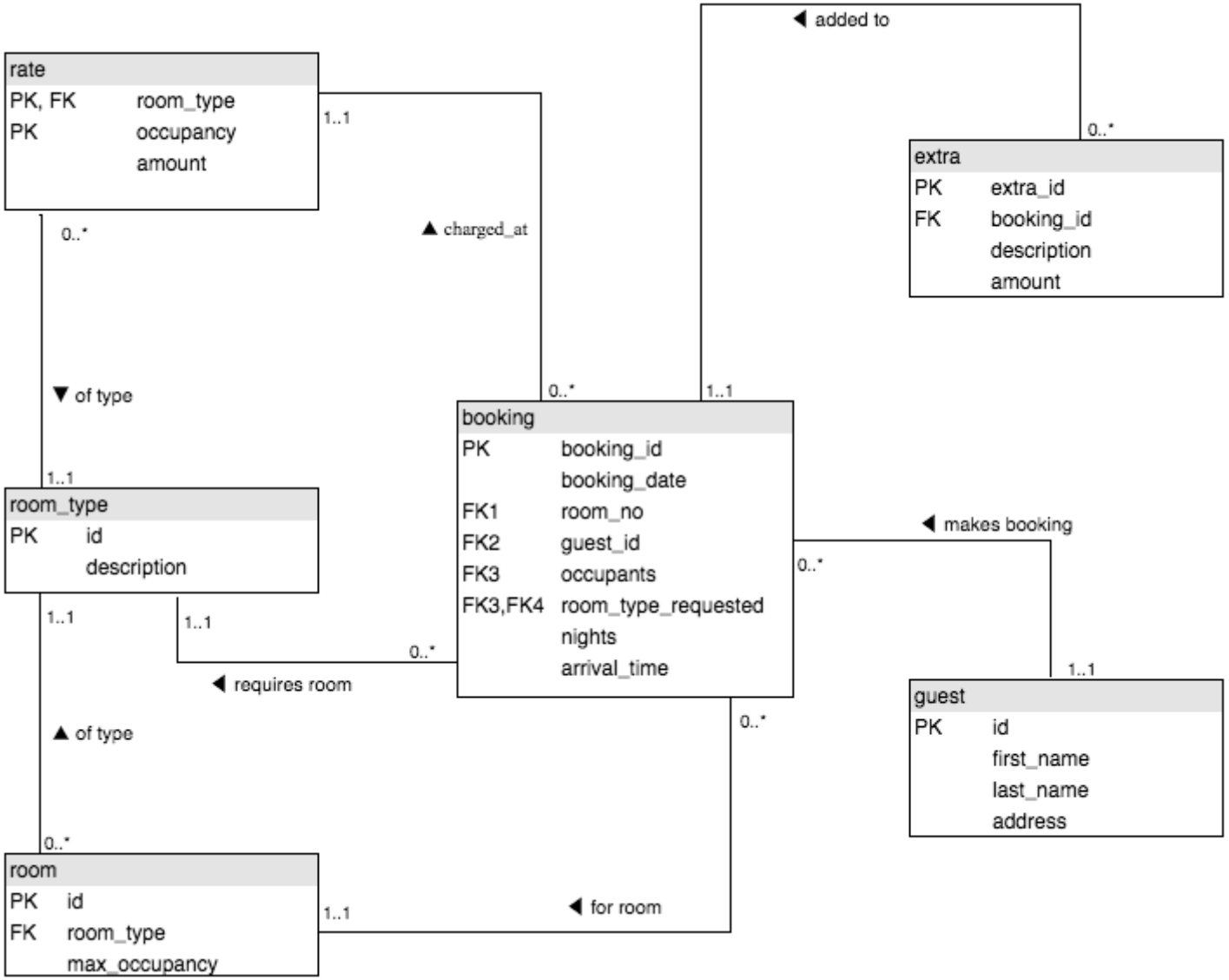
- Guests may pay all or part of their bill at different times. These four example payments must be recorded:
    - For booking id 5360 the amount due (3 nights at £72 = £216) was paid by debit card when the guest checked out on 11th Dec
    - For booking id 5359 the amount £288 was paid in advance by BACS (direct bank transfer) on 20th Nov
    - For the same booking 5359, the extras amount of £49.06 was paid in cash when the guest checked out.
    - The total bill for bookings 5012 and 5064 was settled at the end of November 2016 with a single BACS payment.
- It must be possible to answer a guest's query about how much they owe at any time.
- It must be possible to view all payments made including the date they were made, the amount and the method of payment used.
- It must be possible to find out how much money has been taken in cash on any given day.

A correct solution for the problems above is worth up to 70%; to get marks over 70% assuming that everything else is correct you should attempt the following additional requirement:

- VAT must be paid on all booking and on some extras. VAT at 20% is already included in the prices shown however we must keep a record so that we know how much VAT must be paid to Inland Revenue at the end of the year. Some extras (such as phone calls) attract VAT at 20%. Some extras (such as breakfast) do not attract VAT. There may be more types of extra and the VAT rates may change in the future.

You are required to submit:

1. An update of the ER diagram to include tables/attributes to support these additional features
2. SQL statements to:
    a. alter the database to include any additional tables and attributes required
    b. insert data to reflect the FOUR payments specified above


rate
PK, FK room_type
PK occupancy
amount
1..1
0..*
charged_at
added to
0..*
extra
PK extra_id
FK booking_id
description
amount
0..*
of type
1..1
booking
PK booking_id
booking_date
FK1 room_no
FK2 guest_id
FK3 occupants
FK3,FK4 room_type_requested
nights
arrival_time
1..1
makes booking
0..*
1..1
guest
PK id
first_name
last_name
address
room_type
PK id
description
1..1
1..1
0..*
requires room
of type
0..*
0..*
room
PK id
FK room_type
max_occupancy
1..1
for room