M358
Assignment Booklet III

TMA 03 Cut-off date : 24 May 2004

Please send all your answers to each tutor-marked assignment (TMA), together with an appropriately completed assignment form (TMA form), to reach your tutor on or before the appropriate cut-off date shown above.

If you wish your tutor to acknowledge receipt of your TMA, complete an assignment acknowledgement card, affix the appropriate postage and send it to your tutor together with your TMA.

You will find instructions on how to fill in the TMA form in the current Student Handbook. Remember to fill in the correct Assignment Number as listed above and allow sufficient time in the post for each assignment to reach its destination on or before the cut-off date.

The marks allocated to each part of each question are indicated in the margin.

Please also note it is to your benefit to monitor the acknowledgement from your tutor on the receipt of your TMA within two weeks after submission; otherwise any claim for TMA Lost in Postage ***will not be accepted.***

Question 1 (10 marks)

Some of the following queries are well formulated and some are not. For each query that is well formulated, provide a simple sentence expressing the request that the query answers. Otherwise, explain why the query is not well formulated. (You may assume all tables and column names are valid).

a)
```
SELECT student_id, course_code, AVG(grade) AS average_grade
FROM assignment
ORDER BY student_id, course_code
```
[3]

b)
```
SELECT assignment_no, course_code, AVG(grade) AS average_grade
FROM assignment
GROUP BY assignment_no, course_code
WHERE assignment_no = '1'
```
[3]

c)
```
SELECT phone_no, student_id
FROM telephone
WHERE student_id IN
   (SELECT student_id
   FROM assignment
   WHERE assignment_no = '3'
   AND grade < 50)
```
[4]

Question 2-3

The SQL statements in this question apply to the Study database. Some parts require you to send your tutor both the SQL statement and the result of executing the statements using the Study database. You can obtain a copy of the table displayed in the Select window as the result of a query by using the Save-Rows-As option under the File menu to save the table as a text file. This can then be printed or pasted into a document.

Question 2 (30 marks)

a) For each of the following requests, give a simple SQL query that provides the data specified. Show both the query and a copy of the table resulting from its execution.

i) Give the staff number, name and region of each of those staff who tutor students. [5]

ii) Give the staff number, name and region of each of those staff who do not tutor students. [5]

iii) For each region where the average grade achieved by all students on all assignments is greater than 50, give the region and the average grade (to two decimal places). [5]

iv) For each student whose counsellor is also their tutor on a course, give the student's name and their counsellor's name. [5]

b) Consider the following query.

```
SELECT c.course_code, title, count(student_id)
FROM course c, enrolment e
WHERE c.course_code = e.course_code
GROUP BY c.course_code, title
HAVING COUNT(student_id) > 3
```

i) Give the request that this query answers. [3]

ii) Describe the logical processing of the query according to the model given in the course text. [7]

Question 3 (60 marks)

(a) Region 4 of the University plans to make a new view of the **student** table available. The view includes only the student identifier, name and registration year for students in Region 4. The view is to be named **R4_student**. Give an SQL statement to create it, and a listing of its apparent contents. [4]

(b) A copy of the contents of the view is required in a new table called **R4_student_orig**. You can discover the types of the columns in **R4_student** from the Columns form, accessible via the Form button. Give SQL statements to create **R4_student_orig**, and to insert data from the view. Include a listing of its contents in your answer. [6]

(c) (i) Grant a privilege that allows everyone to inspect **R4_student**. [3]

(ii) Grant user **faculty** the privileges to insert, delete and update **R4_student**, and also enable that user to pass these privileges on to other users. [3]

(iii) Assuming that **R4_student** is the only table of student data available to **faculty** and **admin** users, complete the following table detailing the operations and student data available to different users.

	dba	*faculty*	*admin*
Operations			
Select	Y	…	…
Insert	Y	Y	....
Update	Y	…	N
Delete	Y	Y	...
Columns			
Student_id	Y	Y	...
Name	Y	...	Y
Registered	Y	Y	...
Counsellor_no	Y	...	N
Region	Y	N	...
Rows	All	...	...

[7]

(d) Region 4 also requests a new table to record students from the region who participate in self-help groups on particular courses. The new table, **R4_support**, records the student_id of the participant and the course_code of the course that the self-help group covers.

(i) Give an SQL statement to create **R4_support** with both columns as primary key. [4]

(ii) Give SQL statements to insert the following rows, and show that the insertions have been successful by including in your answer a listing of **R4_support**.

('s10', 'c3')
('s10', 'c7')
('s57', 'c3')
('s57', 'c4') [3]

(iii) Give the SQL statement to add a referential constraint to capture the requirement that every member of the self-help group must be enrolled on the course that the group covers. The statement must specify that the **R4_support** row should be deleted if the referenced row is deleted. [4]

(e) The following sub-parts use the tables and view defined above, together with the constraints.

Explain *all* of the effects, and the technical reasons for those effects, of the following operations.

(i)
```
INSERT INTO R4_support
   VALUES ('s05', 'C2')
```
[2]

(ii)
```
UPDATE R4_support
SET course_code = 'c5'
WHERE student_id = 's10' AND COURSE_CODE = 'c3'
```
[3]

(iii)
```
INSERT INTO R4_support
   VALUES ('s07', 'C4')
```
[1]

For the following giving reasons, describe the impact of this operation on the **student** and **R4_student_orig** tables and the **R4_student** view.

(iv)
```
UPDATE R4_student
SET name = 'Thomson'
WHERE student_id = 's02'
```
[6]

(f) Considering the semantics of the **R4_support** table, explain why the insertion in part (e)(iii) above should not be permitted. Give an SQL statement that adds a constraint to the **R4_support** table to prevent this inconsistency. [6]

(g) The region 4 administrator requests that **R4_ support** be extended to record the city that the student resides in as a string of up to 15 characters.

(i) Give an SQL statement to add a column to **R4_support** to meet this new requirement. [4]

(ii) Give an SQL statement to record that student 's10' lives in London. [4]

END