Total No. of Questions—**5**] [Total No. of Printed Pages—**4+2**

Seat No.	

[4968]-3001

B.C.A. (Third Semester) EXAMINATION, 2016

301 : RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS)

(2013 PATTERN)

Time : Three Hours **Maximum Marks : 80**

N.B. **:—** (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

1. Attempt all : [16]

(*a*) Write any *two* distinguishing characteristics of RDBMS.

(*b*) Give any *four* features of PL/SQL.

(*c*) Which are the conflict operations of transaction ?

(*d*) Define lock. List types of lock.

(*e*) Define :

(*i*) Physical block

(*ii*) Buffer block.

(*f*) List the iterative statements in PL/SQL.

(*g*) What is dirty read problem ?

(*h*) Give any *four* features of oracle.

P.T.O.

2. Attempt any *four* : [16]

(*a*) Explain in detail relationship between application program and RDBMS.

(*b*) What is cursor ? Explain attributes of cursor.

(*c*) Write a note on conflict serializability.

(*d*) Write a note on deadlock.

(*e*) Explain designing issues of remote backup system.

3. Attempt any *four* : [16]

(*a*) Explain stored procedure in PL/SQL with its syntax and example.

(*b*) What is transaction ? Explain properties of transaction.

(*c*) Write a note on granting of locks.

(*d*) Explain the different types of schedules related to recovery with example.

(*e*) Write a note on recovery from concurrent transactions.

4. Attempt any *four* : [16]

(*a*) Consider the following relational database :

Employee(eno, ename, city, deptname)

Project(pno, pname, status)

emp_proj.(eno, pno, no-of-days)

Write a function which will return total number of employees working on given project.

(*b*) Consider the following relational database :

student (roll_no, name, class, percentage)

teacher(tno, tname)

stud_teach(roll_no, tno, subject)

Write a trigger which will restrict insertion or updation of student having percentage greater than 100.

(*c*) Consider the following relational database :

Customer (cno, cname, city)

Account (ano, acc_type, balance, cno)

Write a procedure which will display account and customer details of given account number.

(*d*) Consider the following relational database :

Department(dno, dname)

Book(bno, bname, pubname, price)

Dept_book(dno, bno)

Write a cursor to display details of all books purchased for a 'computer' department.

(*e*) Consider the following relational database :

Movie(mvno, mvname, releaseyear)

Write a package which will consist of one procedure and one function. Pass movie name as a parameter to procedure and display details of movie. Pass release year as a parameter to function and return total number of movies released in a given year.

5. Attempt any *four* : [16]

(*a*) Consider the following transactions. Find out two non-serial schedules that are serializable :

T_1	T_2
Read (P)	Read (P)
P = P + 100	P = P – 100
Write (P)	Write (P)
Read (Q)	Read (Q)
Read (R)	Q = Q – 200
Q = Q + 200	Write (Q)
Write (Q)	
R = R + 300	
Write (R)	

(*b*) Consider the following non-serial schedule. Is this schedule serializable ?

T_1	T_2
Read (x)	
Read (m)	
$x = x + m$	
	Read (n)
	Read (x)
	$x = x + n$
Write (x)	
	Write (x)
Read (y)	
$y = y + m$	
Write (y)	

(*c*) The following is the list of events in an interleaved execution if set T_1, T_2, T_3 and T_4 assuming 2PL. Is there a deadlock ? If yes, which transactions are involved in deadlock ?

Time	Transaction	Code
t_1	T_1	Lock (A, X)
t_2	T_2	Lock (B, S)
t_3	T_3	Lock (A, S)
t_4	T_4	Lock (C, S)
t_5	T_1	Lock (B, X)
t_6	T_2	Lock (C, X)
t_7	T_3	Lock (D, S)
t_8	T_4	Lock (D, X)

(*d*) The following is the list of events in an interleaved execution if set T_1, T_2, T_3 and T_4 assuming 2PL. Is there a deadlock ? If yes, which transactions are involved in deadlock ?

Time	Transaction	Code
t_1	T_1	Lock (A, X)
t_2	T_2	Lock (B, X)
t_3	T_3	Lock (C, X)
t_4	T_4	Lock (A, S)
t_5	T_1	Lock (C, S)
t_6	T_2	Lock (D, S)
t_7	T_3	Lock (D, S)
t_8	T_4	Lock (B, S)

(*e*) The following are the log entries at the time of system crash :

[start_transaction, T_1]

[write_item, T_1, P, 10, 20]

[commit T_1]

[start-transaction, T_2]

[write_item, T_2, Q, 30, 20]

[write_item, T_2, R, 20, 30]

[commit T_2]

[checkpoint]

[start-transaction, T_4]

[write_item, T_4, S, 20, 10]

[start-transaction, T_3]

[write_item, T_3 T_1, 10, 30] ← system crash

If immediate update with checkpoint is used, what will be the recovery ?