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

**325 : RELATIONAL DATABASE MANAGEMENT
SYSTEM (RDBMS)**

(2008 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) What is RDBMS ? List any *two* RDBMS features.
- (b) What is difference between procedure and function in PL/SQL ?
- (c) What is cursor ? List types of cursor.
- (d) Define view serializability.
- (e) Define cascadeless schedule.
- (f) Define :
 - (i) Growing Phase;
 - (ii) Shrinking Phase.
- (g) List types of log record.
- (h) Define :
 - (i) Physical block;
 - (ii) Buffer block.

2. Attempt any four : [16]

- (a) Explain any *two* popular RDBMS product.
- (b) Explain PL/SQL block structure with example.
- (c) Explain states of transaction in detail with the help of diagram.
- (d) Explain two phase locking protocol with example.
- (e) Explain ways to handle the recovery from concurrent transaction.

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3. Attempt any *four* : [16]
- (a) Explain while loop used in PL/SQL with proper syntax and example.
 - (b) Explain in detail the problems of concurrency in transaction.
 - (c) Write a note on deadlock handling.
 - (d) Explain in detail various different types of storage.
 - (e) Explain advantages of remote backup system.
4. Attempt any *four* : [16]
- (a) Consider the following Relational Database :
Department(Dept_no, Dept_name, Location)
Employee(Emp_no, Emp_name, Emp_city, Emp_desg, Emp_salary, Dept_no)
Write a cursor to display the details of all employees having salary between 20,000 to 30,000.
 - (b) Consider the following Relational Database :
Movie(M_no, M_name, Rel_year)
Actor(A_no, A_name)
Mov_Act(M_no, A_no, Rate)
Define a trigger that will take care of the constraint that rate should not be less than zero.
 - (c) Consider the following Relational Database :
Game(Game_no, Game_name, Team_size, Name_of_coach)
Player(Player_no, Player_name, Player_city)
Game_Player(Game_no, Player_no)
Write a function which will take city name as a parameter and return total number of players playing from given city.
 - (d) Consider the following Relational Database :
Doctor(Doct_no, Doct_name, Doct_city)
Hospital(Hosp_no, Hosp_name, Hosp_city)
Doct_Hosp(Doct_no, Hosp_no, Day_of Visit)

Write a procedure which will take doctor name as a parameter and display details of all hospitals visited by that doctor from Pune city.

- (e) Write a package, which consist of one procedure and one function; pass a number to procedure and print whether number is even or odd. Pass person age as a parameter to a function and count number of person of given age. For this consider relation Person (Name, Address, City, Age)

5. Attempt any *four* : [16]

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

T1	T2	T3
Read (C)	Read (B)	Read (D)
Read (A)	$B = B + 700$	Read (C)
$A = A + C$	Write (B)	$C = C + D$
Write(A)	Read(A)	Write(C)
Read (B)	$A = A + 700$	Read (B)
$B = B - C$	Write (A)	$B = B - D$
Write (B)		Write (B)

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

T1	T2
Read (X)	Read (X)
$X = X + 2000$	$T = X * 10$
Write (X)	$X = X + T$
Read (Z)	Write (X)
$Z = Z - 2000$	Read (Y)
Write (Z)	$T = Y * 20$
	$Y = Y + T$
	Write (Y)

- (c) The following is the list of events in an interleaved execution if transactions T1, T2, T3 and T4 assuming 2PL. Is there a deadlock? If yes, which transactions are involved in deadlock?

Time	Transaction	Code
t1	T1	Lock (B, S)
t2	T2	Lock (A, X)
t3	T3	Lock (C, S)
t4	T4	Lock (E, S)
t5	T1	Lock (A, S)
t6	T2	Lock (C, X)
t7	T3	Lock (B, X)
t8	T4	Lock (D, S)

- (d) The following is the list of events in an interleaved execution if transactions T1, T2, T3 and T4 assuming 2PL. Is there a deadlock? If yes, which transactions are involved in deadlock?

Time	Transaction	Code
t1	T1	Lock (A, X)
t2	T2	Lock (B, X)
t3	T3	Lock (A, S)
t4	T4	Lock (B, S)
t5	T1	Lock (C, S)
t6	T2	Lock (D, S)
t7	T3	Lock (D, S)
t8	T4	Lock (C, X)

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

[start-transaction, T1]

[write-item T1,D,2]

[commit, T1]

[start-transaction, T2]

[write-item T2,C,5]

[commit, T2]

[checkpoint]

[start-transaction, T3]

[write-item T3,B,3]

[commit, T3]

[start-transaction, T4]← system crash

If deferred update with checkpoint technique is used, what will be the recovery procedure ?