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[5163]-301

B.C.A. (III Sem.) EXAMINATION, 2017

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) Give any *two* differences between DBMS and RDBMS.

(b) What is trigger ? List types of trigger.

(c) What is transaction ? List properties of transaction.

(d) Define :

(i) growing phase

(ii) shrinking phase.

(e) List different types of failures.

(f) Define cascadeless schedule.

(g) Give Lock-compatibility matrix.

(h) Write syntax of nested if statement in PL/SQL with example.

2. Attempt any *four* :

[16]

(a) Explain any *four* objects of oracle.

P.T.O.

- (b) Explain the following predefined exception :
no-data-found, zero-divide, two-many-rows, duplicate-val-on-index.
- (c) Explain states of transaction with the help of suitable diagram.
- (d) What is PL/SQL ? Explain different data types in PL/SQL.
- (e) What is deadlock ? Explain deadlock prevention methods.

3. Attempt any *four* : [16]

- (a) Write a short note on storage type.
- (b) What is cursor ? List attributes of cursor with an example.
- (c) What is serializability ? Explain view serializability with example.
- (d) Explain Thomas write rule.
- (e) Explain remote backup system with the help of a diagram.

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 procedure which will take employee no as a parameter and display total no. of projects on which given employee works.

(b) Consider the following relational database :

Book(bno, bname, pubname, price, dno)

Dept(dno, dname, location)

Write a function which will return total expenditure on books of a given department.

(c) Consider the following relational database :

Dept(dno, dname, location)

Employee(empno, empname, salary, comm, designation, dno)

Define a trigger that will take care of the constraint that employee salary should not be less than zero.

(d) Consider the following relational database :

Party(P-code, P-name)

Politician(pno, pname, designation, p-code)

Write a cursor to display details of all politician of 'BJP' party.

(e) Write a package which consist of one procedure and one function.

Consider relation student :

Student(Roll-no, stud-name, class, stud-addr, percentage)

Procedure of a package will display details of given student
function of a package will count total number of students having percentage >70 and class 'SYBCA'.

5. Attempt any four :

[16]

(a) Consider the following transactions :

T₁	T₂
Read(z)	Read(x)
$z = z + 100$	Read(y)
Write(z)	$y = y - x$
Read(y)	Write(y)
$y = y - 100$	
Write(y)	

Give *two* non-serial schedules that are serializable.

(b) Consider the following transactions :

T₁	T₂
Read(A)	Read(A)
$A = A + 1000$	$A = A - 1000$
Write(A)	Write(A)
	Read(B)
	$B = B + 1000$
	Write(B)

Give *two* non-serial schedules that are serializable.

- (c) The following is the list of events in an interleaved execution of set T_1, T_2, T_3 and T_4 assuming 2PL protocol. 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, X)
t_8	T_4	Lock(B, X)

- (d) The following is the list representing the sequence of events in an interleaved execution of set transactions T_1, T_2, T_3 and T_4 assuming 2PL protocol. Construct a wait for graph according to request. Is there deadlock at any instance. Justify.

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

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

[start-transaction, T₂]

[write-item, T₁, B, 200]

[commits, T₁]

[checkpoint]

[start-transaction, T₂]

[write-item, T₂, C, 250]

[commit, T₂]

[start-transaction, T₃]

[write-item, T₃, C, 300]

[start-transaction, T₄]

[write-item, T₄, A, 400]

[write-item, T₃, D, 250] ← system crash

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