



DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER V [INFORMATION TECHNOLOGY]
SUBJECT: (IT 502) DATABASE MANAGEMENT SYSTEM

Examination : Third Sessional **Seat No.** :
Date : 13/10/2016 **Day** : Thursday
Time : 12.45 to 02.00 **Max. Marks** : 36

INSTRUCTIONS:

1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed.

- (a) The drawback of shadow paging technique are [1]
(A) Commit overhead (B) Data fragmentation (C) Garbage collection (D) All of these
- (b) _____ ensures that once transaction changes are done, they cannot be undone or lost, even in the event of a system failure. [1]
(A) Atomicity (B) Consistency (C) Durability (D) Isolation
- (c) A DBMS uses a transaction _____ to keep track of all transactions that update the database. [1]
(A) log (B) table (C) block (D) statement
- (d) Deadlocks are possible only when one of the transactions wants to obtain a(n) _____ lock on a data item. [1]
(A) binary (B) exclusive (C) shared (D) complete
- (e) Justify: All conflict equivalent schedules are also view equivalent but reverse is not true. [2]
- (f) What are the intention lock modes? Why it is required? Explain in detail. [2]
- (g) List out and explain advantages of replication. [2]
- (h) Which of the following concurrency control protocols ensure both conflict serializability and freedom from deadlock? Justify it. [2]
I. 2-phase locking II. Time-stamp ordering
(A) I only (B) II only (C) Both I and II (D) Neither I nor II

Q.2 Attempt *Any Two* from the following questions. [12]

- (a) What is Deferred database modification technique for recovery? How recovery does take place in case of failures in this technique. Explain clearly with examples. [6]
- (b) Consider the following schedule with several data items and timestamps of T1, T2, T3, and T4 are 2, 1, 3, and 4 respectively. [6]

T1	T2	T3	T4
	Read(X)		
Read(Y)			
		Write(Y)	
		Write(Z)	
	Read(Z)		
Read(X)			
			Read(W)
		Write(W)	
	Write(Y)		
	Write(Z)		

Under time-stamp ordering protocol:

- (A) Which transactions are able to finish? Also give the serial order of the transactions which are able to finish.
- (B) Which transactions have to be rolled-back?
- (c) What are distributed databases? Explain distributed database systems architecture and the advantages and disadvantages of distributed databases. [6]

- Q.3** (a) Differentiate between serial schedule and serializable schedule. Why we require that all schedules which executes on DBMS is serializable? Consider below schedule S1 and S2. [6]
- Note: Meaning of “S1: r1(X); r1(Y); r2(X); r2(Y); w2(Y); w1(X)” is in concurrent schedule S1 there are two transactions. First T1 is performing read(X) then read(Y), and then T2 is performing read(X), read(y), and write (Y). Then again T1 modifies the X and do Write(X). Which one of the following statements is true?*
- S1: r1(X); r1(Y); r2(X); r2(Y); w2(Y); w1(X)
S2: r1(X); r2(X); r2(Y); w2(Y); r1(Y); w1(X)
- (A) s1 is conflict serializable and s2 is not conflict serializable.
(B) both s1 and s2 are conflict serializable
(C) both s1 and s2 are not conflict serializable
(D) s1 is not conflict serializable and s2 is conflict serializable
- (b) Explain shadow-paging technique for the purposes of recovery. [6]

OR

- Q.3** (a) Explain the two-phase commit protocol with how it handling failures of distributed database system. [6]
- (b) Explain multiple granularity protocol. [6]