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	**: 10/10/2015**	**Day**	**: Saturday**
Time	**: 12.00 to 01.15**	**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.

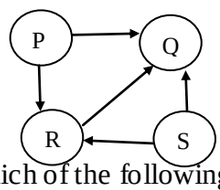
(a) Consider the following schedule S in which two transactions T1 and T2 participate. **[2]**
Assume the initial value of X is 200.

T1	T2
lock-S(X)	
	lock-X(X)
	X = X + 10
	unlock(X)
upgrade(X)	
X = X * 10	
unlock(X)	

Consider the following statements:
A) After both transaction finishes, the value of X is 2010
B) After both transaction finishes, the value of X is 2100
C) Both transactions T1 and T2 acquires/releases/upgrades locks according to two-phase locking protocol

Which of the following is correct?
1) Only A and C are true.
2) Only B and C are true.
3) Only B is true.
4) All of A, B and C are false.

(b) Consider the following precedence graph: **[2]**



Which of the following is correct:
A) There is no serial schedule
B) Both <P Q R S> and <S P R Q> are serial schedules
C) Both <P S R Q> and <S P R Q> are serial schedules
D) Only <P S R Q> is the serial schedule.

(c) Consider the following two statements: **[2]**
A) Every conflict-serializable schedule is view-serializable
B) Every view-serializable schedule is conflict-serializable.
Which one of the following is correct:
1) Only A is true. 2) Only B is true.
3) Both A and B are true. 4) Both A and B are false.

(d) Consider the following two statements: **[2]**
A) There are conflict-serializable schedules which cannot be obtained by two-phase locking.
B) There are conflict-serializable schedules which cannot be obtained by time-stamp ordering protocol.
Which one of the following is correct:
1) Only A is true 2) Only B is true
3) Both A and B are true 4) Both A and B are false

(e) Which of the following protocols ensures conflict serializability and freedom from deadlocks: **[1]**
1) Strict two-phase locking protocol 2) Time-stamp ordering protocol
3) Graph-based protocol 4) Both (2) and (3) above

(f) State true or false with justification: **[3]**
1) Freedom from deadlock implies freedom from starvation.
2) Every recoverable schedule is cascadeless.
3) Deadlock cannot occur if every transaction executes serially.

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

(a) What is immediate modification technique for recovery? How recovery does takes place in case of failures in this technique. Explain clearly with examples. [6]

(b) Explain shadow-paging technique for the purposes of recovery. [6]

(c) Consider the following schedule with several data items and timestamps of T1, T2, T3, T4 and T5 are 1, 5, 3, 4 and 2 respectively. [6]

T1	T2	T3	T4	T5
	Read(X)			
				Read(Y)
Read(Y)				
		Write(Y)		
		Write(Z)		
	Read(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?

Q.3 (a) Consider the following schedule S of transactions T1, T2, T3, T4: **[6]**

T1	T2	T3	T4
	read(X)		
		write(X)	
		commit	
write(X)			
commit			
	write(Y)		
	read(Z)		
	commit		
			read(X)
			read(Y)
			commit

Which one of the following statements is CORRECT? Justify your answer in detail.

(A) S is conflict-serializable but not recoverable

(B) S is not conflict-serializable but is recoverable

(C) S is both conflict-serializable and recoverable

(D) S is neither conflict-serializable nor is it recoverable

(b) What are distributed databases? Explain distributed database systems architecture and the advantages and disadvantages of distributed databases. **[6]**

OR

Q.3 (a) Explain types of deadlock handling techniques in database. Also explain deadlock prevention in detail. **[6]**

(b) Explain multiple granularity protocol. **[6]**