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	**: 09/10/2018**	**Day**	**: Tuesday**
Time	**: 11.45 to 01.00**	**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) For correct behavior during recovery, undo and redo operations must be **[1]**
(a) commutative (b) associative (c)idempotent (d)distributive

(b) What is checkpoint? Why check-pointing mechanism is required in database recovery? **[1]**

(c) What are the intention lock modes? Why is it require? Explain in detail. **[2]**

(d) Draw and explain distributed database system architecture, with the responsibility of each components. **[2]**

(e) Prove that cautious waiting avoids deadlock. List out and explain methods for preventing deadlock. **[3]**

(f) Why concurrency control is needed? Explain types of problems occurs in database if transaction executes concurrently. **[3]**

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

(a) Explain the two-phase commit protocol along with how it handle failures of Distributed Database System. [6]

(b) Consider the following Schedule S1, with several data items and transactions T1, T2, and T3. There are three transactions (indicated by the subscript) using read and write on a data item X by Transaction one, denoted by r1(X) and w1(X) respectively. [6]
S1:r1(X); r2(Z); r3(X); r1(Z); r2(Y); r3(Y); w1(x); w2(Z); w3(y); w2(Y);
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 is Differed Database Modification Technique for recovery? How recovery does takes place in case of failures in this technique. Explain clearly with examples. [6]

Q.3 (a) Differentiate between serial schedule and serializable schedule. Why we require that all schedules which executes on DBMS is serializable? Consider the following four schedules due to three transactions (indicated by the subscript) using read and write on a data item x by Transaction one, denoted by r1(x) and w1(x) respectively. Which one of them is conflict serializable? If a schedule is serializable, write down its equivalent serial schedule. **[6]**

(A) $r_1(x)$; $r_2(x)$; $w_1(x)$; $r_3(x)$; $w_2(x)$

(B) $r_2(x)$; $r_1(x)$; $w_2(x)$; $r_3(x)$; $w_1(x)$

(C) $r_3(x)$; $r_2(x)$; $r_1(x)$; $w_2(x)$; $w_1(x)$

(D) $r_2(x)$; $w_2(x)$; $r_3(x)$; $r_1(x)$; $w_1(x)$

(b) Draw and Explain Shadow-Paging mechanism for the purpose of recovery management. **[6]**

OR

Q.3 (a) What are Distributed Databases? Explain Distributed Database Systems architecture and the advantages and disadvantages of Distributed Databases. **[6]**

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