

**BCSE302L Database System**  
**Slow Learner Assignment-III**

1. Which of the following schedules is (conflict) serializable? For each serializable schedule, determine the equivalent serial schedules.
  - a.  $r_1(X); r_3(X); w_1(X); r_2(X); w_3(X);$
  - b.  $r_1(X); r_3(X); w_3(X); w_1(X); r_2(X);$
  - c.  $r_3(X); r_2(X); w_3(X); r_1(X); w_1(X);$
  - d.  $r_3(X); r_2(X); r_1(X); w_3(X); w_1(X);$

2.
 

| Time | T1                | T2                |
|------|-------------------|-------------------|
| t1   | Begin_Transaction |                   |
| t2   | Read(P)           |                   |
| t3   | $P = P - 20$      |                   |
| t4   | Write (P)         | Begin_Transaction |
| t5   |                   | Read(P)           |
| t6   |                   | $P = P * 1.15$    |
| t7   |                   | Write (P)         |
| t8   |                   | Read(Q)           |
| t9   |                   | $Q = (Q + P) / 2$ |
| t10  |                   | Write (Q)         |
| t11  |                   | Commit            |
| t12  | Read(Q)           |                   |
| t13  | $Q == Q + 10$     |                   |
| t14  | Write (Q)         |                   |
| t15  | Commit            |                   |

Assume that the initial value of P and Q is 200 and 150.

Consider the execution of transactions T1 and T2 and find the value of P and Q after execution.

3. Consider the following schedules and determine whether each schedule is strict, cascade less, recoverable, or non-recoverable. Explain with justification.
  - (i) S1:  $w_3(A); w_2(B); r_3(C); w_1(D); r_2(A);$
  - (ii) S2:  $w_2(B); w_1(D); w_3(A); r_1(D); r_2(A);$
  - (iii) S3:  $w_2(A); w_1(D); r_1(A); r_3(C); w_3(C);$
4. Consider a database with objects X and Y and assume that there are two transactions T1 and T2. Transaction T1 reads objects X and Y and then writes object X. Transaction T2 reads objects X and Y and then writes objects X and Y.
  - (i) Give an example schedule with actions of transactions T1 and T2 on objects X and Y that results in a write-read conflict.
  - (ii) Give an example schedule with actions of transactions T1 and T2 on objects X and Y that results in a read-write conflict.

(iii). Give an example schedule with actions of transactions T1 and T 2 on objects X and Y that results in a write-write conflict.

5. The transactions are scheduled as follows:

i. S1: w2(A); r3(D) ; w2 (B) ; r2(C) ; r1(A) ; r3(D) ;w1(B) ;

ii. S2: r1(A) ; w2(B) ; r1(C) ; w1(D) ; r3(A) ; r2(D) ; r1(C);

Consider the given schedule and check whether the given schedules are serializable or not. Explain with proper justification.