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Ans 4.2:

Code:

```
DROP TABLE IF EXISTS StudentEnrollments;
```

```
CREATE TABLE StudentEnrollments ( enrollment_id
INT PRIMARY KEY, student_name VARCHAR(100)
NOT NULL, course_id
VARCHAR(10) NOT NULL, enrollment_date
DATE NOT NULL,
CONSTRAINT unique_student_course UNIQUE (student_name, course_id) --
ensures uniqueness
) ENGINE=InnoDB;
```

```
INSERT INTO StudentEnrollments VALUES
```

```
(1, 'Ashish', 'CSE101', '2024-07-01'),  
(2, 'Smaran', 'CSE102', '2024-07-01'),  
(3, 'Vaibhav', 'CSE101', '2024-07-01');
```

```
-- Part A
```

```
START TRANSACTION;
```

```
INSERT INTO StudentEnrollments VALUES (4, 'Ashish', 'CSE101', '202407-  
02'); -- duplicate
```

```
COMMIT;
```

```
--PART B
```

```
--USER A
```

```
START TRANSACTION;
```

```
SELECT * FROM StudentEnrollments
```

```
WHERE student_name = 'Ashish' AND course_id = 'CSE101'
```

```
FOR UPDATE;
```

```
--user B
```

```
START TRANSACTION;
```

```
UPDATE StudentEnrollments
```

```
SET enrollment_date = '2024-07-05'
```

```
WHERE student_name = 'Ashish' AND course_id = 'CSE101';
```

```
COMMIT;
```

```
-- Now User B's query executes and updates the row.
```

```
COMMIT;
```

```
SELECT * FROM StudentEnrollments;
```

```
--PART C
```

```
--USER A
```

```
START TRANSACTION;
```

```
UPDATE StudentEnrollments
```

```
SET enrollment_date = '2024-07-10'
```

```
WHERE enrollment_id = 1;
```

```
-- Not committed yet
```

```
--USER B
```

```
UPDATE StudentEnrollments
```

```
SET enrollment_date = '2024-07-15'
```

```
WHERE enrollment_id = 1;
```

```
COMMIT;
```

```
SELECT * FROM StudentEnrollments WHERE enrollment_id = 1
```

```
START TRANSACTION;
```

```
SELECT * FROM StudentEnrollments WHERE enrollment_id = 1 FOR  
UPDATE;
```

```
UPDATE StudentEnrollments
```

```
SET enrollment_date = '2024-07-20'
```

```
WHERE enrollment_id = 1;
```

```
-- Keep open
```

-- User B tries to update (will be blocked until A commits):

UPDATE StudentEnrollments

SET enrollment_date = '2024-07-25'

WHERE enrollment_id = 1;

-- When User A commits:

COMMIT;

-- Now User B executes

COMMIT;

-- Final state remains consistent:

SELECT * FROM StudentEnrollments WHERE enrollment_id = 1;

(a) PART A

Error: Duplicate entry 'Ashish-CSE101' for key 'studentenrollments.unique_student_course'

(b) PART B

enrollment_id	student_name	course_id	enrollment_date
1	Ashish	CSE101	2024-07-01T00:00:00.000Z
2	Smaran	CSE102	2024-07-01T00:00:00.000Z
3	Vaibhav	CSE101	2024-07-01T00:00:00.000Z

(c) PART C

enrollment_id	student_name	course_id	enrollment_date
1	Ashish	CSE101	2024-07-25T00:00:00.000Z