

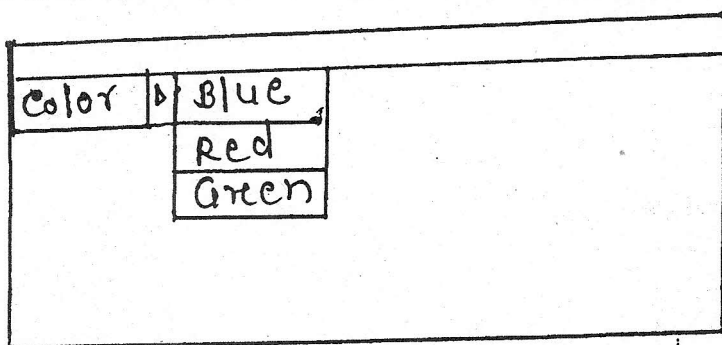
- N.B. :** (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** out of remaining **six** questions.
(3) Make suitable assumptions if **required**.

1. (a) Explain time-stamp ordering protocol and Thoma's Write Rule. 10
(b) Give use of msybox, inpute box. Explain with example. 2
(c) State and explain use of OLE. 2
(d) Design any application to make use of following controls : 6
 - Text Box
 - Command Button
 - List Box
 - Labels
 - Option Button
 - Check Box

2. (a) Draw an E-R diagram for the university database with following entities— 10
 - Courses including number title, syllabus and credits and prerequisites
 - Course offerings including course number year, semester, section number, instructor timing, classroom alloted.
 - Student including id, name and program
 - Instructors including number, name department and title
 - Enrolment of student in courses and grade awarded to student must be appropriately modeled.
- (b) Explain following terms :- 10
 - two-phase locking protocols
 - graph based protocols.

3. (a) Explain log-based and checkpoint based recovery mechanism in DBMS. 10
(b) Explain Murphie's law of GUI in detail with the help of an example and state features of GUI 10

4. (a) Write a code to create color selection menu by using Menu Editor. 8



Your code should apply the selected color for the background.

- (b) What is SQL ? Explain the following structures of SQL queries with appropriate example : 12
 - (i) Select clause
 - (ii) Where clause
 - (iii) From clause
 - (iv) Agregate function
 - (v) With clause

5. (a) Explain following relational algebra operators with example— 10
 - (i) Rename
 - (ii) Set-difference
 - (iii) Outer joint
 - (iv) Cartesian product
 - (v) Assignment
- (b) What are the standard used for GUI. 5
- (c) Write short note on icon and graphics. 5

