DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER V [IT]
SUBJECT: (IT-502) DATABASE MANAGEMENT SYSTEM

Examination	**: Regular External Exam(online)**	**Seat No.**	**: _____**
Date	**: 01/12/2020**	**Day**	**: Tuesday**
Time	**: 2 hours**	**Max Marks**	**: 30**

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.
5. Follow the following file name convention for uploading the document:
BTech_Semester_IDNo_SubjectCode_SubjectName.pdf

SECTION - II

Q.1 Answer any three from the following: **[15]**

(A) Explain Two-phase locking protocol with example. Differentiate between strict two-phase and rigorous two-phase locking protocol. **[05]**

(B) Differentiate between the following terms with example:- **[05]**
i) Sparse indexing and dense indexing
ii) Immediate database modification and deffered database modification.

(C) i) Let relation R(A,B,C,D,E,F,G,H) satisfy the following functional dependencies F = {A→ B,CH → A, B→ E, BD→C, EG → H, DE → F }. Find out all possible candidate keys of R. **[05]**
ii) Find Canonical cover for the relation R(VWXYZ) with functional dependency as F = { V -> W, VW -> X, Y -> VWX}

(D) What is deadlock. Which are the methods to avoid deadlock from the system explain with an example. Draw Wait-For graph for following transactions: **[05]**

T1 is waiting for T4	T5 is waiting for T8
T2 is waiting for T7	T6 is waiting for T2
T3 is waiting for T2	T7 is waiting for T6
T4 is waiting for T1	T8 is not waiting

Which transactions are leading to deadlock.

Q.2 Answer the following: **[15]**

(A) Draw an ER-diagram for online Cab management system (like ola or uber). Also mention which relations can be converted to relational tables from your diagram. **[05]**

(B) **Consider the following relational database schema:-** **[05]**
Passenger(pid, pname, pgender,pcity)
Agency(aid, aname, acity)
Flight(fid, fdate, time, src, dest)
Booking(pid, aid,fid,fdate)
Write the relational algebra queries for the following
i. Find the details of all flights from "Chennai" to "Kolkata". [01]
ii. Find only the flight numbers with pid 110 for flights to Ahmedabad before 01/12/2020. [01]
iii. Find the details of flights that are scheduled on both the dates 01/12/2020 and 02/12/2020 at 16:00 hours. [01]

iv. Find the agency name for agencies who do not have any bookings for passenger with id 140. [02]

(C) Consider an empty B+ tree with order 4. Insert following elements in B+tree X = {26,13,40,32,22,18,15,35,42,46, 42,12,1,8,5,2} **[05]**
Now delete the node 26,40 and 46.

OR

Q.2 Answer the following: [15]

(A) Draw Relational Database model for Tours and Travel agency system. Clearly show primary and foreign keys. **[05]**

(B) Consider the following relational database schema:- [05]

BOOK(Book_id, Title, Publisher_name)
BOOK_AUTHORS(Book_id, Author_name)
PUBLISHER(Publisher_Name, Address, Phone)
BOOK_COPIES(Book_id, Branch_id, No_of_copies)
BOOK_LOANS(Book_id, Branch_id, Card_no, Date_out, Due_date)
LIBRARY_BRANCH(Branch_id, Branch_name, Address)
BORROWER(Card_no, Name, Address, Phone)

Write the SQL queries for the following:-

i. Add email_id in Book_Authors schema and make it as a primary key [01]
ii. How many copies of the book titled 'DBMS Concepts' are owned by the library branch whose name is 'DDU Central Library' [01]
iii. Find the Publisher_name and Title of the book whose author is 'EVAN BAYROSS' [01]
iv. Find the name and phone of all the borrowers who are having due_date today [02]

(C) What is hashing. How it is different than indexing. **[05]**
Consider an extensible hash structure where buckets can hold up to three entries. Initially the structure is empty. The keys and their hash values are given below:-

A 00001
B 00011
C 00110
D 01110
E 01111
F 10001
G 10101
H 10111
I 11000
K 11001
L 11101
M 11111

i) Create the hash table assuming sequence of insertion order is same as given above.
ii) Create the hash table assuming sequence of insertion order is F,E,D,C,B,A,M,L,K,I,H,G.

****