

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA - SEMESTER– V EXAMINATION – WINTER 2016

Subject Code: 650004

Date: 24/11/ 2016

Subject Name: Advanced Database Management Systems

Time: 10.30 am to 01.00 pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Discuss design decisions about indexing. Why denormalization is considered as a decision for speeding up queries? **07**
- (b) i) What is logical and physical data independence? **04**
ii) List implicit properties of a database. **03**

- Q.2** (a) What is GIS? List components of GIS. Discuss data models for GIS. **07**
(b) List various goals for tuning. Explain in brief query tuning. **07**

OR

- (b) Explain in brief public key encryption and digital signatures. **07**

- Q.3** (a) Define DBMS. Explain in detail advantages of DBMS. **07**
(b) List various types of indexes. Explain in brief primary index with its advantages and disadvantages. **07**

OR

- Q.3** (a) Explain in brief recovery technique based on deferred update. **07**
(b) Consider a disk with block size $B=512$ bytes. A block pointer is $P=6$ bytes long, and a record pointer is $PR=7$ bytes long. A file has $r=30,000$ EMPLOYEE records of fixed length. Each record has the following fields: NAME (30 bytes), SSN (9 bytes), DEPARTMENT CODE (9 bytes), ADDRESS (40 bytes), PHONE (9 bytes), BIRTHDATE (8 bytes), SEX (1 byte), JOBCODE (4 bytes), SALARY (4 bytes, real number), JOININGDATE (8 bytes). **07**
- a) Calculate the record size R in bytes.
- b) Calculate the blocking factor bfr and the number of file blocks b , assuming an unspanned organization.
- c) Suppose that the file is *ordered* by the key field SSN and we want to construct a *primary* index on SSN. Calculate (i) the index blocking factor $bfri$; (ii) the number of first-level index entries and the number of first-level index blocks;

- Q.4** (a) i) Explain in brief horizontal and vertical fragmentation. **04**
ii) List additional functions that DDBMS have over a Centralized DBMS. **03**
- (b) How the insert, delete and update commands should be implemented on a Valid time relation? What is Proactive, Retroactive and Simultaneous update? **07**

OR

- Q.4** (a) What is distributed database? Discuss advantages of it. **07**
Q.4 (b) How the insert, delete, and update commands should be implemented on a bitemporal time relation? List various options for storing the records in a temporal relation. **07**

- Q.5 (a)** Explain in brief any two object relational features included in SQL with example. **07**
- (b)** i) What is bulk inserts and deletes? **04**
ii) What is Partitions? List various ways to partition table data. **03**
- OR**
- Q.5 (a)** Write Short Note: Multimedia databases. **07**
- (b)** What is Oracle Net? Explain in brief its components. **07**
