G 1666 (2 pages) **Reg. No.....**

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2005

Fifth Semester

Computer Science and Engineering/Information Technology

DATABASE MANAGEMENT SYSTEMS (R, T)

(New Scheme – 2002 Admission onwards)

Time : Three Hours Maximum : 100 Marks

Part A: Answer **all** *questions. Each question carries* 4 *marks.*

Part B: Each question carries 12 *marks.*

Part A

1. Define and explain the terms data model and database schema.
2. What is the difference between logical data independence and physical data independence?
3. Explain the difference between primary key and foreign key.
4. Distinguish between relational algebra and relational calculus.
5. Explain the concept of transaction processing system.
6. What are the various transaction models?
7. Explain functional dependency. Why it cannot be inferred from a particular relation state?
8. Explain when two set of functional dependencies are equivalent.
9. What are the advantages of distributed database?
10. What is data fragmentation? Why it is a useful concept in distributed database design?

(10 × 4 = 40 marks)

Part B

11. (a) Describe the three schema in DBMS architecture? Why do we need mapping between schema levels?

Or

(b) Discuss the types of software components that constitute a DBMS. Explain the interaction of DBMS with other system software.

Turn over

12. (a) Define and explain update operations of relational data model. Discuss how violations of integrity constraints are handled.

Or

(b) Consider the relation

CLASS (Course#, Univ_Section#, Instructor_Name, semester, BuldingCode, Room#, TimePeriod, Weekdays, CreditHours).

This represent classes taught in a university, with unique univ_section#. Identify suitable candidate keys and write the constraints under which each candidate key would be valid.

13. (a) Discuss with examples why concurrency control and recovery are necessary in a database system.

Or

(b) Draw a state transition diagram and discuss the typical states that a transaction goes through during execution. What is commit point of transaction ?

14. (a) Write an algorithm that check whether a given decomposition D has the losless join property with respect to a set of functional dependencies F.

Or

(b) Show that the relation schemas produced by relational synthesis algorithm with dependency preservation and lossless join property are in 3NF.

15. (a) Explain some of the techniques that have been suggested to deal with recovery and concurrency control in distributed DBS.

Or

(b) Explain the features of distributed database system (DBS). Discuss the issues affecting the design of DBS.

(5 × 12 = 60 marks)