

2122  
B.E. (Computer Science and Engineering)  
Third Semester  
CS-302: Database Systems

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Part.

x-x-x

I	a) What do you understand by system catalog? What is its purpose? b) List any four factors that can be used to evaluate an indexing technique. c) Why do we need cursors in SQL? Discuss in brief. d) How are primary keys related to FDs? Discuss in brief. e) What is meant by granularity of data? Why is data granularity important?	(02) (02) (02) (02) (02)
PART A		
II	a) Why would you choose a database system instead of simply storing data in operating system files? When would it make sense not to use a database system? Discuss. b) What do you understand by File Organization? Explain any two types of file organizations and discuss their advantages and disadvantages.	(05) (05)
III	a) Draw and explain ER diagrams for a Hospital Management System. Appropriately assume any required information yourself. b) Differentiate between tuple relational calculus and domain relational calculus.	(06) (04)
IV	a) What is the use of aggregate operators in SQL? Explain any four aggregate operations supported by SQL with the help of suitable examples. b) What is the goal of query optimization? Is it to find the best plan? How does a DBMS represent a relational query evaluation plan? Discuss.	(05) (05)
PART B		
V	a) Define 3NF and BCNF. What is the motivation for putting a relation in 3NF? What is the motivation for BCNF? Discuss with the help of an example. b) Draw a state diagram and discuss the typical states that a transaction goes through during execution.	(05) (05)
VI	a) Discuss the deferred update technique of recovery. What are the advantages and disadvantages of this technique? Discuss. b) What is role-based access control? In what ways is it superior to DAC and MAC? Discuss.	(05) (05)
VII	Write notes on the following: a) Firewalls and their role in database security b) Buffer Management	(05) (05)