Course: B. Tech Computer Science and Engineering
(AI & ML)
Subject: Database Management Systems,
Subject Code: ETCS-205
Semester: III

Time: 03 Hours **Max Marks: 70**

Instructions to the Students:

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of short answer type. All questions are compulsory. Each question carries 2. marks.
3. Section B comprises 8 long answer type questions out of which students must attempt any 5. Each question carries 10 marks.
4. Do not write anything on the question paper.

Q.No.	SECTION –A (SHORT ANSWER TYPE QUESTIONS)	Marks
1. a.	Given a relation R(P, Q, R, S, T, U, V, W, X) and Functional Dependency set FD = { PQ → R, QS → TU, PS → VW, and P → X }, determine the given R is in which normal form?	(2)
b.	List the problem that can be solved using concept of lacking?	(2)
c.	State the various abstraction level of database.	(2)
d.	Write down 2 features of Relational calculus.	(2)
e.	Explain the concept of Data independence.	(2)
f.	Define the term cardinality in the relational model.	(2)
	Note:-Questions G,H,I,J is based on this data Suppose that there is an ordered file with 30,000 records stored on a disk with block size of 1024 bytes. File records are fixed size and unspanned with 100 bytes of record length.	(2)
g.	Compute the blocking factor of file.	(2)
h.	Find the number of blocks required for the file.	(2)
i.	What are the number of block accesses required by binary search ?	(2)
j.	Calculate the number of entries in the primary index of the file.	(2)

SECTION –B (ESSAY ANSWER TYPE QUESTIONS)

2. Explain following terms by giving suitable examples- (10)
   i. Data Definition language
   ii. Data Manipulation language
3. Sketch an ER model of banking system/ hospital system. The model should include: (10)
   a) Strong and weak entity
   b) Recursive relationship
   c) One to one relationship
   d) One to many relationship
   e) Specialization/ Generalization
4. Explain different database management system architectures with suitable examples. (10)
5. Formulate SQL queries for the following:- (10)
   a) Fetch ename who are managers
   b) To set eid as primary key and deptID as foreign key
   c) Find out salary review date of each employee such that salary review date is after 6 months of the joining date
   d) Find out ename of employee whose salary is greater than average salary
   e) Display all data ordered by salary in descending order.
6. List and explain different indexing techniques. What is the requirement of secondary index if primary index already exists. (10)
7. Explain different database management system architectures with suitable examples. (10)
8. Define concurrency control. Justify its need (10)
9. Illustrate and discuss various two phase locking technique for concurrency control (10)

===END OF PAPER===