Jan-Feb. 2026
~~Nov — Dec 2025~~

B. Tech Program: Information Technology Scheme I/II/IIB/III: III

~~Supplementary~~ *Regular*/Supplementary Examination: SY Semester: III

Course Code: ITC303 & Course Name: Database Management System

Date of Exam: ~~02 - 12 - 2025~~ Duration: 02.5 Hours   Max. Marks: 60

05 | 02 | 2026

Instructions:
(1) All questions are compulsory.
(2) Draw neat diagrams wherever applicable.
(3) Assume suitable data, if necessary.

Qu. No.	Question	Max. Marks	CO	BTL
Qu-1	Solve any **TWO** questions out of three: (05 marks each)	10		
a)	Explain the responsibilities of database administrator.		CO1	2
b)	Use SQL to explain authorization to the user .		CO4	3
c)	Design an EER diagram based on the following scenario: An Employee may be Engineer, Technician, and Secretary, an Employee may be an Hourly Employee or Salaried Employee and explain generalization and specialization.		CO2	6
Qu-2	Solve any **two** questions out of three: (05 marks each)	10		
a)	Consider the relational schema: **Employee (Eid, Ename, Contactno, Location)** Write relational algebra queries for the following. i. Find names of employees whose location is 'Mumbai' ii. Find names of the employees whose Eid is greater than 3.		CO3	3
b)	Design a relational schema for a U*niversity Database* that stores details about Students, Courses, and Instructors. Clearly specify the entities, attributes, and functional dependencies, ensuring the design that satisfies the Third Normal Form (3NF).		CO5	6
c)	Explain log based recovery system.		CO6	2
Qu-3	Solve any **two** questions out of three. (10 marks each)	20		
a)	Draw and explain DBMS system architecture.		CO1	2
b)	i) Explain deadlock handling in detail. ii) Explain lock based protocol.		CO6	2
c)	List the ER-to-Relational mapping rules and apply them to convert the ER diagram from Qu-4(a) into its corresponding relational model.		CO3	3
Qu-4	Solve any **two** questions out of three. (10 marks each)	20		
a)	Draw an ER diagram for the **Invoice** table shown in Table-1. Include at least two entities that are directly related to the Invoice table and clearly indicate their associations with appropriate participation (cardinality) values.		CO2	6

Jan–Feb : 2026
Nov – Dec 2025

B. Tech Program: Information Technology Scheme I/II/IIB/III: III
Supplementary Regular/Supplementary Examination: SY Semester: III
Course Code: ITC303 & Course Name: Database Management System
Date of Exam: 05/02/2026   Duration: 02.5 Hours   Max. Marks: 60

			CO4	3
b)	i) Consider the following employee Employee (<u>empname</u>, street, city, date_of_joining) Works (empname,company_name,salary) Company (<u>company_name</u>, city) Write SQL queries for i. Modify the database such that 'John' now lives in 'Mumbai'. ii. Find all employees who joined in the month of 'July'. iii. Give all employees of 'L& T 'a raise of 10%. iv. List all employees who earn more than average salary of all their employees. v. Find all employees works in 'Reliance'.			
c)	i. List all functional dependencies satisfied by the relation of **Figure-1**. ii. Explain BCNF with suitable example.		CO5	3 2

Table-1: INVOICE

Attribute Name	Sample Value	Sample Value	Sample Value	Sample Value	Sample Value
INV_NUM	20251347	2025347	2025347	2025348	2025349
PROD_NUM	AA-E3422QW	QD-300932X	RU-995748G	AA-E3422QW	GH-778345P
SALE_DATE	15-Jan-2025	15-Jan-2025	15-Jan-2025	15-Jan-2025	16-Jan-2025
PROD_LABEL	Rotary sander	0.25-in. drill bit	Band saw	Rotary sander	Power drill
VEND_CODE	211	211	309	211	157
VEND_NAME	NeverFail, Inc.	NeverFail, Inc.	BeGood, Inc.	NeverFail, Inc.	ToughGo, Inc.
QUANT_SOLD	1	8	1	2	1
PROD_PRICE	₹ 4204.95	₹ 289.90	₹ 3249.55	₹ 4204.95	₹ 3996.95

A	B	C
$a1$	$b1$	$c1$
$a1$	$b1$	$c2$
$a2$	$b1$	$c1$
$a2$	b1	$c3$

Figure-1 Relation for the Qu-4 C (i).

****