Reg.No.

Bansilal Ramnath Agarwal Charitable Trust's
VISHWAKARMA INSTITUTE OF TECHNOLOGY, PUNE – 411037.
(An Autonomous Institute Affiliated to Savitribai Phule Pune University)

Examination: ESE

Year: 2022-23 **Branch:** SYCommon-CS/ENTC/IC/AI

Subject: Database Management Systems **Subject Code:** CS2227

Max. Marks: 60 **Total Pages of Question Paper:** 02

Day & Date: Tuesday- 20/12/2022 **Time:** 11:0am TO 1:0pm

Instructions to Candidate

1. All questions are compulsory.
2. Neat diagrams must be drawn wherever necessary.
3. Figures to the right indicate full marks.

Q. N.	CO No	BT* No		Max marks
Q. 1.	2	1	A] Define DBMS. Explain advantages of DBMS over file system.	4
	1	3	B] Design database for the following application using an ER model considering the constraints given below– • In a library multiple students can enroll. • Students can become a member by paying an appropriate fee. • The books in the library are identified by a unique ID. • Students can borrow multiple books from subscribed libraries.	6
Q. 2.	2	2	A] Explain distinctions among the terms Primary key, Foreign key, candidate key and super key along with suitable example.	4
	2	2	B] State the need of normalization and Explain 1NF with example.	6
			OR	
	2	4	B] Analyze whether following relation is in 3NF.If no, explain procedure to convert it into 3 NF.	6

EMP_ID	EMP_NAME	EMP_ZIP	EMP_STATE	EMP_CITY
222	Harry	201010	UP	Noida
333	Stephan	02228	US	Boston
444	Lan	60007	US	Chicago
555	Katharine	06389	UK	Norwich
666	John	462007	MP	Bhopal

Q. 3.	3	5	A] Consider following schema: account (acct-no, branch - name, balance) Depositor (cust - name, acct - no) borrower (cust-name, loan-no) loan (loan - no, branch - name, amount) Write following queries using SQL **(any 3)** 1. Find the names of all branches in the loan relations, and remove duplicates. 2. Find the name, loan number and loan amount of all customers having a loan at the Perryridge branch.	6

			3. Find average account balance at each branch. 4. Find all customers with a loan, an account, or both.	
			OR	
	3	3	A] What do you mean by Trigger? Explain with suitable example.	6
	3	6	B] Explain different DDL,DML commands with example.	4
Q. 4.	5	1	A] What is Transaction? During its execution, a transaction passes through several states, until it finally commits or aborts. List all possible sequences of states through which a transaction may pass.	6
	5	2	B] State and explain the ACID Properties.	4
Q. 5.	4	2	A] Explain Distributed database system along with its types.	6
	4	1	B] What do you mean by Intra query and Inter query Parallelism?	4
Q. 6.	6	2	A] Explain following terms: i] No SQL Databases ii] OLAP	6
	6	1	B] Explain architecture and components of data warehouse in short.	4

CO Statements:

CO1: Design data models as per data requirements of an organization
CO2: Synthesize a relational data model up to a suitable normal form
CO3: Develop a database system using relational queries and PL/SQL objects
CO4: Apply indexing techniques and query optimization strategies
CO5: Understand importance of concurrency control and recovery techniques
CO6: Adapt to emerging trends considering societal requirements

***Blooms Taxonomy (BT) Level No:**

1. Remembering; 2. Understanding; 3. Applying; 4. Analyzing; 5. Evaluating; 6. Creating