2019
DATA BASE MANAGEMENT SYSTEM
CS503

TIME ALLOTTED : 3 Hrs **FULL MARKS : 70**

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable

GROUP – A
(Multiple Choice Type Questions)

1. Answer any ***ten*** from the following, choosing the correct alternative of each question: **10×1=10**

		Marks	CO No.
(i)	The collection of information stored in a database at a particular moment is called as a) schema b) instance of the database c) data domain d) independence	01	CO5
(ii)	Cartesian Product in relational algebra is a) Unary operator b) Binary operator c) Ternary operator d) Not defined	01	CO4
(iii)	Which of the following operation is used if we are interested in only certain columns of a table ? a) PROJECTION b) SELECTION c) UNION d) JOIN	01	CO4
(iv)	Which of the following is a trivial functional dependency? a) $X \rightarrow Y$ b) $Y \rightarrow X$ b) $XY \rightarrow Y$ d) $XY \rightarrow Z$	01	CO3
(v)	A characteristic of an entity. a)Relation b)Attribute c)Parameter d) Constraint	01	CO2
(vi)	If X --> YZ then X --> Y and X --> Z is a) Composition Rule b) Reflexivity Rule b) Union Rule c) Decomposition Rule	01	CO3
(vii)	A table on the many side of a one to many or many to many relationship must: a) Be in Second Normal Form (2NF) b) Be in Third Normal Form (3NF) c) Have a single attribute key d) Have a composite key	01	CO3

(viii)	The main task carried out in the _____ is to remove repeating attributes to separate tables. a) First Normal Form b) Second Normal Form c) Third Normal Form d) Fourth Normal Form	01	CO3
(ix)	A table can have only one a) Primary Key b) Candidate Key c) Super Key d) All of these	01	CO1
(x)	Which one of the following is used to define the structure of the relation, deleting relations and relating schemas? a) DML(Data Manipulation Langauge) b) DDL(Data Definition Langauge) c) Query d) Relational Schema	01	CO5
(xi)	Referential intrigity is used for a) query optimization b) primary key c) foreign key d) none of these	01	CO1
(xii)	Advantage of locking protocole a) Deadlock handling b) Consistency c) Concurency d) none of these	01	CO4

GROUP – B
(Short Answer Type Questions)

(Answer any *three* of the following) **3 x 5 = 15**

		Marks	CO No.
2.a)	Explain ACID properties in transaction.	04	CO4
b)	Why it is necessary?	01	CO4
3.	All candidate keys are superkeys but all superkeys are not candidate key. Justify it with suitable example.	05	CO1
4.a)	What do you mean by transitive dependency?	01	CO3
b)	Explain 2 NF with example.	04	CO3
5.	Explain three level architecture of DBMS.	05	CO1
6.a)	Define single valued and multi valued attribute?	02	CO1
b)	Using relational algebra write down the query that finds customers, who have a balance of over 1000 from the relation Borrower.	03	CO4

GROUP – C
(Long Answer Type Questions)

(Answer any *three* of the following) **3 x 15 = 45**

		Marks	CO No.
7.a)	What do you mean by "degree of relationship"? Explain with example.	02+03	CO2
b)	Draw the E - R diagram of the following: A General Hospital consists of a number of specialized wards (such as Maternity, Paediatry, Oncology, etc). Each ward hosts a number of patients, who were admitted on the recommendation of their own GP and confirmed by a consultant employed by the Hospital. On admission, the personal details of every patient are recorded. A separate register is to be held to store the information of the tests undertaken and the results of a prescribed treatment. A number of tests may be conducted for each patient. Each patient is assigned to one leading consultant but may be examined by another doctor, if required. Doctors are specialists in some branch of medicine and may be leading consultants for a number of patients, not necessarily form the same ward.	10	CO2
8.a)	Define BCNF. Why BCNF is stronger than 3NF?	02+03	CO2
b)	Consider the following relations: EMPLOYEE (emp_id, emp_name, street, city) WORKS (emp_id, emp_name, company_name, salary) COMPANY (company_name, city) MANAGES (emp_name, manager_name) Write down the following queries in relational algebra based on above relations.		CO3
i)	Find the names of all employees who work for "Juniper Enterprise"	02	CO3
ii)	Find the names, streets and cities of all employees who work for the "Mykart Logistics" and earn more than 450000 per year.	02	CO3
iii)	Find the names of all employees who live in the same city as the company for which they work.	02	CO3
iv)	Find the number of employees working in each company.	02	CO3
v)	Find the maximum, minimum and average salary for each company.	02	CO3

9.a)	Define transaction. Describe with proper state transition diagram.	02+03	CO4
b)	Explain the 2 Phase locking protocol. What is the benefit of two-phase locking protocol?	03+02	CO4
c)	What is deadlock in transaction? Explain with an example.	02+03	CO4
10.a)	What are Armstrong axioms? Explain.	05	CO3
b)	ConsiderR={A,B,C,D,E} and the functional dependencies are like F={A $\rightarrow$ BC, CD $\rightarrow$ E, B $\rightarrow$ D, E $\rightarrow$ A} Find out the candidate kays.	05	CO3
c)	What do you mean by indexing. Why indexing is used?	02+03	CO5
11.	Short Note: (Any three)	3×5=15	
	a) Functional dependencies and Multivalued dependency		CO2
	b) DKNF		CO2
	a) Deadlock prevention		CO4
	b) Metadata		CO5
	c) Serializable schedule		CO4