Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058
(An Autonomous Institute Affiliated to University of Mumbai)

End Semester Examination
April 2018

Max. Marks: 100   Duration: 180 Minutes
Class: SE   Semester: 4
Course Code: CE42, IT43   Branch: COMP, IT
Name of the Course: Database Management System

Instructions:
(1) All Questions are Compulsory
(2) Draw neat diagrams
(3) Assume suitable data if necessary

Question No.		Max. Marks	CO
Q1	Answer any 4 out of 6		
(a)	Discuss the advantages of Database over File Systems.	05	1
(b)	Consider the following table.	05	4

A	B	C
10	b1	c1
10	b2	c2
11	b4	c1
12	b3	c4
13	b1	c1
14	b3	c4

Which of the following dependencies may hold in the above relation? If the dependency cannot hold, explain which tuple causes violation.
  i. $B \rightarrow C$
  ii. $A \rightarrow B$
  iii. $B \rightarrow A$
  iv. $C \rightarrow A$
  v. $C \rightarrow B$

Question No.		Max. Marks	CO
(c)	Explain generalization and specialization with appropriate examples.	05	2
(d)	Discuss why assertions must be used with utmost care.	05	3
(e)	Illustrate with the help of a diagram the various transaction states.	05	5
(f)	Explain the role of a DBA	05	5
Q2 (a)	Draw an ER diagram for Library Management System and map the ER diagram to relations.	10	2

Q2 (b)	Consider the relational database given below, where the primary keys are underlined.
	employee (<u>person-name</u>, street, city)
	works (<u>person-name, company-name</u>, salary)
	company (<u>company-name</u>, city)
	manages (<u>person-name, manager-name</u>)
	Give an expression in the relational algebra to express each of the following queries:
	   i. Find the names of all employees who work for First Bank Corporation.
	   ii. Find the names and cities of residence of all employees who work for First Bank Corporation.
	   iii. Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than \$10,000 per annum.
	   iv. Find the names of all employees in this database who live in the same city as the company for which they work.
	   v. Assume the companies may be located in several cities. Find all companies located in every city in which Small Bank Corporation is located.
		10	2

Q3 (a)	What is a view in SQL? How is it defined? Discuss the problems that may arise while updating a view. **OR** Explain referential integrity with example.	10	3

Q3 (b)	Consider the following schema and solve the queries
	Course (course_no, title)
	Offering (course_no, off_to, off_date, location)
	Teacher (course_no, off_no, emp_no)
	Enrolment (course_no, off_no, stud_no, grade)
	Employee (emp_no, emp_name, job, sal)
	Student (stud_no, stud_name, phone_no)
	
	   1. List all the teachers who conduct the course titled "Database Systems"
	   2. List all the courses offered in 'Thane' on 15/8/15.
	   3. Find the courses enrolled by "Monali".
	   4. List all the employees jobwise having average salary greater than 5000.
	   5. Add the date_of_birth attribute in the student table
		10	3

Q4 (a)	What are triggers? Explain with example.	10	4
Q4 (b)	Consider the relation R(A,B,C,D,E,F,G,H,I,J) with following functional dependencies: $AB \rightarrow C$ $BD \rightarrow EF$ $AD \rightarrow GH$ $A \rightarrow I$ $H \rightarrow J$ Determine the candidate key for R and normalize the relation	10	4

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	to 3rd normal form. Justify every step. **OR** Consider the relation R(M,Y,P,MP,C) with following functional dependencies: **M,Y→P** **M →MP** **MP →C** Determine the candidate key for R and normalize the relation to 3rd normal form. Justify every step.		

Q5	Answer any 4 out of 6
	   a. Deadlock with wait-for graph.
	   b. What is the meaning of serializability? How do you check whether a schedule is conflict serializable or not?
	   c. Shadow Paging technique
	   d. Timestamp ordering protocol
	   e. Two phase locking protocol
	   f. Validation based protocol
		20	5