Code : 105502

B.Tech 5th Semester Exam., 2020
(New Course)

DATABASE MANAGEMENT SYSTEM

Time : 3 hours *Full Marks* : 70

Instructions:

(i) The marks are indicated in the right-hand margin.

*(ii) There are **NINE** questions in this paper.*

*(iii) Attempt **FIVE** questions in all.*

*(iv) Question No. **1** is compulsory.*

1. Choose the correct answer of the following (any *seven*) : 2×7=14

(a) The way a particular application views the data from the database that the application uses is a

(i) module

(ii) relational model

(iii) schema

(iv) subschema

(b) A relational database developer refers to a record as

(i) a criterion

(ii) a relation

(iii) a tuple

(iv) an attribute

(c) Key to represent relationship between tables is called

(i) primary key

(ii) secondary key

(iii) foreign key

(iv) None of the above

(d) It is better to use files than a DBMS when there are

(i) stringent real-time requirements

(ii) multiple users wish to access the data

(iii) complex relationships among data

(iv) All of the above

(e) Which of the following are the five built-in functions provided by SQL?

(i) COUNT, SUM, AVG, MAX, MIN

(ii) SUM, AVG, MIN, MAX, MULT

(iii) SUM, AVG, MULT, DIV, MIN

(iv) SUM, AVG, MIN, MAX, NAME

(f) A B-tree of order 4 and of height 3 will have a maximum of _____ keys.

(i) 255

(ii) 63

(iii) 127

(iv) 188

(g) Consider the following action :

TRANSACTION.....

Commit;

ROLLBACK;

What does rollback do?

(i) Undoes the transactions before commit

(ii) Clears all transactions

(iii) Redoes the transactions before commit

(iv) No action

(h) Which of the following is used to get back all the transactions back after rollback?

(i) Commit

(ii) Rollback

(iii) Flashback

(iv) Redo

(i) _____ is an attack which forces an end user to execute unwanted actions on a Web application in which he/she is currently authenticated.

(i) Two-factor authentication

(ii) Cross-site request forgery

(iii) Cross-site scripting

(iv) Cross-site scoring scripting

(j) _____ allows a system administrator to associate a function with a relation; the function returns a predicate that must be added to any query that uses the relation.

(i) OpenID

(ii) Single-site System

(iii) Security Assertion Markup Language (SAML)

(iv) Virtual Private Database (VPD)

2. *(a)* What are the five main functions of a database administrator? 7

(b) What are four main differences between file-processing system and a DBMS? 7

3. Construct an *E-R* diagram for a university registrar's office. The office maintains data about each class, including the instructor, the enrollment, and the time and place of the class meetings. For each class pair, a grade is recorded. Document all assumptions that you make about the mapping constraints. 14

4. *(a)* What is the use of relational query language in DBMS? Use the example to explain tuple and domain relational calculus. 7

(b) Explain the following operations with the help of examples : 7

(i) Generalized projection

(ii) Outer join

(iii) Aggregate function

5. Construct the B+ tree for the following set of key values :

(2, 3, 5, 7, 11, 17, 19, 23, 29, 31)

Assume that tree is initially empty and values are added in ascending order. Construct B+ tree for the cases where the number of pointers that will fit in one node is as follows : 14

(a) Four

(b) Six

(c) Eight

6. *(a)* List the ACID properties. Explain the usefulness of each. 7

(b) What benefit is provided by rigorous two-phase locking? How does it compare with other forms of two-phase locking? 7

7. *(a)* What is the purpose of having separate categories for index authorization and resource authorization? 7

(b) Explain the data mining and data warehousing related to DBMS. 7

8. Compute the closure (F+) of the following set of functional dependencies for the relational schema $(A, B, C, D, E) = R$. List the candidate keys for R : 14

$A \rightarrow BC$

$CD \rightarrow E$

$B \rightarrow D$

$E \rightarrow A$

9. Write short notes on the following : 14

(a) RBAC model

(b) Concurrency control

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