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Question Paper Code : X 60380

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Fourth Semester

Computer Science and Engineering

CS 2255/CS 46/CS 1254/10144 CS 406/080250009 – DATABASE MANAGEMENT SYSTEMS

(Common to Information Technology)

(Regulations 2008/2010)

(Also Common to PTCS 2255 – Database Management Systems for B.E. (Part-Time)

Third semester – CSE – Regulations 2009)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. List four significant differences between a file-processing system and a DBMS.
2. What are the different types of Data Models ?
3. What are primary key constraints ?
4. Write the purpose of Trigger.
5. Define Normalization.
6. What are functional dependencies ?
7. What is a cascading update ?
8. What are the disadvantages of not controlling concurrency ?
9. What is a rigorous two phase locking protocol ?
10. What is a heap file ? How pages are organized in a heap file ?



PART – B

(5×16=80 Marks)

11. a) i) Why would you choose a database system instead of simply storing data in operating system files ? When would it make sense not to use a database system ?
- ii) Explain the difference between logical and physical data independence. **(8+8)**

(OR)

- b) Notown Records has decided to store information about musicians who perform on its albums (as well as other company data) in a database. The company has wisely chosen to hire you as a database designer.

Each musician that records at Notown has an SSN, a name, an address and a phone number. Poorly paid musicians often share the same address, and no address has more than one phone.

Each instrument used in songs recorded at Notown has a unique identification number, a name (e.g., guitar, synthesizer, flute) and a musical key (e.g., C, B-flat, E-flat).

Each album recorded on the Notown label has a unique identification number, a title, a copyright date, a format (e.g. CD or MC), and an album identifier.

Each song recorded at Notown has a title and an author.

Each musician may play several instruments, and a given instrument may be played by several musicians.

Each album has a number of songs on it, but no song may appear on more than one album.

Each song is performed by one or more musicians and a musician may perform a number of songs.

Each album has exactly one musician who acts as its producer. A musician may produce several albums, of Course.

Design a conceptual schema for Notown and draw an ER diagram for your schema. The preceding information describes the situation that the Notown database must model. Be sure to indicate all key and cardinality constraints and any assumptions you make. Identify any constraints you are unable to Capture in the ER diagram and briefly explain why you could not express them. **(16)**

12. a) Explain in detail about Relational Algebra, Domain Relational Calculus and Tuple Relational Calculus with suitable examples. **(16)**

(OR)

- b) Briefly present a survey on Integrity and Security. **(16)**



13. a) Consider the following relation

CAR-SALE (Car #, Date-Sold, Salesman #, Commission %, Discount-amount)

Assume that a car may be sold by multiple salesmen, and hence (Car #, Salesman #) is the primary key.

Additional dependencies are

Date-Sold → Discount-amt

and

Salesman # → Commission %

Based on the given primary key, is this relation in 1 NF, 2 NF, or 3 NF ? Why or why not ? How would you successively normalise it completely ? **(16)**

(OR)

- b) Explain the principles of
 - i) Loss less join decomposition. **(5)**
 - ii) Join dependencies. **(5)**
 - iii) Fifth normal form. **(6)**

14. a) i) Write a note on SQL facilities. **(8)**
ii) With a neat sketch explain the states of a transaction. **(8)**

(OR)

- b) i) Explain the ACID Properties of a transaction. **(8)**
ii) Describe two phase locking protocol with examples. **(8)**

15. a) What is RAID ? Briefly explain different levels of RAID. Discuss the factors to be considered in choosing a RAID level. **(16)**

(OR)

- b) i) Explain the physical characteristics of magnetic disk. **(8)**
ii) Discuss the techniques to improve the speed of access to blocks on disks. **(8)**