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Question Paper Code: 53206

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Third Semester

Computer Science and Engineering

15UCS306 – DATABASE SYSTEM CONCEPTS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Data Models: A collection of tools for describing CO1-R
 - (a) Data relationships
 - (b) Tools to modify data
 - (c) Data constraints
 - (d) User Interface to modify data
2. Identify the valid data-types, which can be used in SQL to define the type of data. CO2-U
 - (a) varchar
 - (b) string
 - (c) real
 - (d) float
3. Locking may cause which of the following problem CO3-U
 - (a) Erroneous update
 - (b) Deadlock
 - (c) Versioning
 - (d) Transaction log
4. Choose the correct option about the indexing of a file in database. CO4-R
 - (a) It can have only one clustered index with multiple secondary indexes
 - (b) It can have multiple clustered indexes.
 - (c) It can have both a primary and a clustered index.
 - (d) All of the above.
5. The time for repositioning the arm is called _____ CO5- R
 - (a) Average Time
 - (b) Seek Time
 - (c) Latency time
 - (d) access time

PART – B (5 x 3= 15Marks)

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| 6. | List the functions of database administrator. | CO1- R |
| 7. | Define functional dependency | CO2- App |
| 8. | Write the ACID properties of Transaction. | CO3- R |
| 9. | What are ordered indices? | CO4- R |
| 10. | State the need for Query Optimization. | CO5-U |

PART – C (5 x 16= 80Marks)

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| 11. | (a) Illustrate Relational algebra and its operations with examples. | CO1- App | (16) |
| | Or | | |
| | (b) With the block diagram explain the architecture of a DBMS | CO1-U | (16) |
| 12. | (a) Express in SQL queries. Consider the following relations.
COUNTRY(NAME,CONTINENT,POPULATION,GDP,LIFE-
EXPECTANCY)
RIVER(NAME,ORIGIN,LENGTH)
CITY(NAME,COUNTRY,POPULATION)
GDP and Population in million
a) Find all countries whose GDP is greater than Rs500
Billion but less than Rs1 trillion
b) List the life expectancy in countries that have river
originating in them.
c) Find all cities that are either in south America or whose
population is less than 2 million
List out all cities which are not in South America. | CO2-U | (16) |
| | Or | | |
| | (b) Consider the universal relation R(A,B,C,D,E,F,G,H,I,J) and the
set of FD's.
$G = (\{A,B\} \rightarrow \{C\} \rightarrow \{E,F\}, \{A,D\} \rightarrow \{G,H\}, \{A\} \rightarrow \{I\}, \{H\} \rightarrow \{J\})$
what is the key of R? Decompose R into 2NF then 3NF
relations. | CO2-App | (16) |
| 13. | (a) Outline serializability with suitable examples. | CO3-U | (16) |
| | Or | | |
| | (b) Compare and contrast lock based protocol and Time Stamp
based Protocols. | CO3-U | (16) |

14. (a) Describe indexing and hashing technique with suitable example. CO4-U (16)
- Or
- (b) Analyze the various levels of disk-organization techniques to achieve improved performance and reliability. CO4-U (16)
15. (a) Describe the overview of Query Processing CO5- U (16)
- Or
- (b) Write short notes on CO5-App (16)
- (i) Join Size Estimation in query optimization.
 - (ii) Heuristics in query optimization

