BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: MCA **SEMESTER : II**
BRANCH: MCA **SESSION : SP/19**

SUBJECT: CA461 DATABASE MANAGEMENT SYSTEM

TIME: 3.00 HOURS **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a) Describe different types of DBMS languages [5]
Q.1(b) Distinguish between various database architectures. [5]

Q.2(a) Differentiate between Relational algebra and Relational calculus. [5]
Q.2(b) Examine the following queries for the below-mentioned relational database and give an expression in tuple relational calculus for them. [5]
EMP(Emp_No, E_Name, Dept_No, DOB, City) *[Dept_No references DEPARTMENT.Dno]*,
DEPENDENT(Emp_No, Dep_Name, Relationship) *[EMP_No references EMP.Emp_No],*
DEPARTMENT(DNO, D_Name, Manager),
SALARY(Eno, Basic, HRA, TA, Tax, Pay) *[Eno references EMP.Emp_No]*.

a) Find the name, city of all employees working for 'Accounting' department.
b) Find the name and department name of all employees whose pay is greater than 10,000.
c) Find the name of all employees who have no dependents.

Q.3(a) Consider a relation R (A, B, C, D, E, F, G, H) with functional dependencies [5]
A→BD, B→C, E→FG, AE→H.
i) List all the possible candidate keys for R.
ii) List all functional dependencies that violate 2NF, 3NF, BCNF. If any, then decompose R accordingly.
Q.3(b) Describe normalization and compare 2NF, 3NF, BCNF with examples. [5]

Q.4(a) Describe timestamp ordering protocol with a suitable example [5]
Q.4(b) Differentiate between serial, complete, recoverable, cascadeless and strict schedules. [5]

Q.5(a) Describe Distributed databases with suitable diagram and compare their types. [5]
Q.5(b) Discuss the steps of query processing in Distributed databases [5]

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