

QUESTION 3:

CLO1.2

SO(K)

[5 Marks]

Consider the following schema

EMPLOYEE

<u>Fname</u>	Minit	Lname	<u>Ssn</u>	Bdate	Address	Sex	Salary	Super_ssn	Dno
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DEPARTMENT

<u>Dname</u>	<u>Dnumber</u>	Mgr_ssn	Mgr_start_date
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DEPT_LOCATIONS

<u>Dnumber</u>	<u>Dlocation</u>
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PROJECT

<u>Pname</u>	<u>Pnumber</u>	Plocation	Dnum
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WORKS_ON

<u>Essn</u>	<u>Pno</u>	Hours
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DEPENDENT

<u>Essn</u>	<u>Dependent_name</u>	Sex	Bdate	Relationship
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For the following query create the canonical tree then apply the steps of Process heuristics optimization to get the best tree

Query: Retrieve the name and address of all employees who work for the 'Research' department

QUESTION 3:

Consider the following schema

EMPLOYEE

<u>Fname</u>	Minit	Lname	<u>Ssn</u>	Bdate	Address	Sex	Salary	Super_ssn	Dno
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DEPARTMENT

Dname	<u>Dnumber</u>	Mgr_ssn	Mgr_start_date
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DEPT_LOCATIONS

<u>Dnumber</u>	<u>Dlocation</u>
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PROJECT

Pname	<u>Pnumber</u>	Plocation	Dnum
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WORKS_ON

<u>Essn</u>	<u>Pno</u>	Hours
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DEPENDENT

<u>Essn</u>	<u>Dependent_name</u>	Sex	Bdate	Relationship
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For the following query create the canonical tree then apply the steps of Process for heuristics optimization to get the best tree

Query: Retrieve the name and address of all employees who work for the 'Research' department

[5 Marks]

[5 Marks]

CLO2.1

SO(S2)

QUESTION 2:Insert the following elements in a B+ tree with $p=3$ and $p_{leaf}=2$

[5 M]

19

16

12

18

14

23

20

17

QUESTION 1:

Complete the following Sentences:

CLO1.1

SO(K1)

[10 Marks]

You might use the following terms:

RAID LEVEL 6 ; BFR ; COMPLETE SET; DEGREE; FILE DESCRIPTOR;
INTERSECTION; JOIN ; NATURAL JOIN; OPEN ADDRESSING; QUERY TREE ; RAID
; RAID LEVEL 0; RELATIONAL CALCULUS; RAID LEVEL 3 ; RENAME ; SELECT;
STATIC EXTERNAL HASHING; UNION; DYNAMIC EXTERNAL HASHING; RAID
LEVEL 4; OUTER JOINS; RAID LEVEL 2

- [1] includes information that describes the file, such as the field names and their data types, and the addresses of the file blocks on disk
- [2] is a tree data structure that corresponds to a relational algebra expression. It represents the input relations of the query as leaf nodes of the tree and represents the relational algebra operations as internal nodes.
- [3] refers to the number of records per block.
- [4]: The result of this operation is a relation that includes all tuples that are in both R and S.
- [5] Main disadvantage of: Fixed number of buckets M is a problem if the number of records in the file grows or shrinks.
- [6]: for this method, a collision is resolved by proceeding from the occupied position specified by the hash address, the program checks the subsequent positions in order until an unused (empty) position is found.
- [7] has no redundant data and hence has the best write performance at the risk of data loss
- [8] uses memory-style redundancy by using Hamming codes, which contain parity bits for distinct overlapping subsets of components. Level 2 includes both error detection and correction.
- [9] The operation is used to combine related tuples from two relations into single "longer" tuples.
- [10] The result of operation is a relation that includes all tuple that are either in R or in S or in both R and S