USN | | | | | | | | | | |

ADVANCES IN DATA BASE MANAGEMENT & MINING
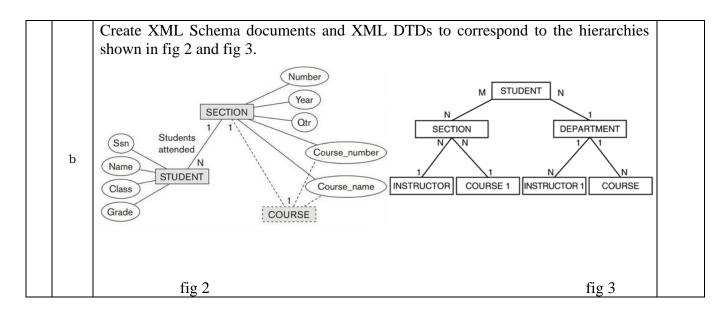**(2022 SCHEME)**
(Non-Integrated Course)

Time: 03 Hours   *Maximum Marks: 100*

Instructions to candidates:

1. Each unit consists of two questions of 20 marks each.
2. Answer FIVE full questions selecting one from each unit (1 to 5).

UNIT-I			
1	a	Consider the following figure below and convert this ER diagram to Relational Model using ER to Relational mapping steps for the fig 1.. Fig 1.	10
	b	Write the XML queries for the following statement below, consider company DB. 1. Write the query to retrieve the first and last names of employees who earn more than 70000. Such that the variable $x is bound to each employee Name element that is a child of an employee element, but only for employee elements that satisfy the qualifier that their employee Salary is greater than 70000. 2. Write a XML query to illustrate how a join operation can be performed by having more than one variable. Here, the $x variable is bound to each project Worker element that is a child of project number 5, whereas the $y variable is bound to each employee element. The join condition matches SSN values in order to retrieve the employee names.	10
		OR	
2	a	List and explain with necessary examples any 6 Database model available in building the Database Management System.	10

		Create XML Schema documents and XML DTDs to correspond to the hierarchies shown in fig 2 and fig 3.	10
	b
fig 2   fig 3 | |

UNIT-II			
3	a	Identify the operations of the built in interfaces of collection objects: 1. cardinality() 2. is_empty() 3. create_iterator() 4. is_superset_of () 5. contains_element()	10
	b	Discuss the steps of the algorithm for Object-Oriented design by EER to Object Oriented mapping.	10
		OR	
4	a	Differentiate the following with respect to object-oriented data model. 1. Regular inheritance, multiple inheritance and selective inheritance. 2. Structured and unstructured complex objects.	10
	b	Discuss the general principle behind the C++ binding of the ODMG stands. Why an ODL not considered as full programming language?	10

UNIT-III			
5	a	With a neat diagram explain mediators. Considering a view in a relation and explain the mediators and wrappers.	10
	b	Differentiate between the following with relevant examples. 1. Semi-join and join of many relations in distributed database 2. Map function and Reduce function reduction in parallel database.	10
		OR	
6	a	Differentiate between the following with relevant diagrams and examples. 1. Federated and Data ware house 2. Parallel and Distributed database.	10
	b	List and analyze the heterogeneity problems arising in in integrated databases (at least 6).	10

UNIT-IV			
7	a	Differentiate between the approaches used in constructing the data in the warehouse with examples for each approach. (Write the Datawarehouse arrangement)	10

	b	Apply the steps to identify the association using Apriori Algorithm for the following database: Database D 	10

TID	ITEMS
100	1 3 4
200	2 3 5
300	1 2 3 5
400	2 5

OR

8	a	Differentiate between the following with examples: 1. Join indexing and bit map indexing. 2. Star and snowflake schema.	10
	b	Construct FP-tree from a Transaction DB 	10

TID	Items bought (o
100	{f, a, c, d, g, i, m, p}
200	{a, b, c, f, l, m, o}
300	{b, f, h, j, o}
400	{b, c, k, s, p}
500	{a, f, c, e, l, p, m, n}

UNIT-V		
9	a	Exemplify the two different Mobile Computing Architecture - infrastructure based mobile platform and infrastructure less mobile platform — **10**
	b	Consider a Relational Schema as in fig 1 Write the active rules for keeping the Sum_commissions attribute of Sales_person equal to the sum of the commission attribute in SALES for each sales person. Your rules should also check if the Sum_commissions exceeds 100000; if it does, call a procedure Notify_manager(S_id). Write both statement-level rules in STARBUST notation and row-level rules in Oracle. **SALES**

S_id	V_id	Commission

SALES_PERSON

Salesperson_id	Name	Title	Phone	Sum_Commissions

10

OR

10	a	Consider a deductive database with the with the following rules:
		 ANSCESTOR(X,Y) :- FATHER (X,Y)
		 ANCESTOR(X,Y) :- FATHER(X,Z), ANCESTOR(Z,Y)
		 Notice that FATHER(X,Y) means that Y is the father of X; ANCESTOR(X,Y) means that Y is the ancestor of X.
		 Consider the following fact base:
		 FATHER(Harry , Issac), FATHER(Issac, John), FATHER(John, Kurt);
		      a. Construct a model theoretic interpretation of the above rules using the given facts.
		      b. Consider that a database contains the above relations FATHER (X,Y),
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| | | another relation BROTHER(X,Y),and a third relation BIRTH (X,B), where B is the birth date of person X. State a rule that computes the first cousins of the following variety : their fathers must be brothers.

c. Show a complete Datalog program with fact-based and rule-based literals that computes the following relation: list of pairs of cousins, where the first person is born after 1960 and the second after 1970. You may use greater than as a built-in predicate. (Note: Sample facts for brother, birth and person must also be shown) | |
| | b | Differentiate between all the 4 Conceptual Data Models for storing spatial data in Geographic Information Systems. | 8 |

Signature of Scrutinizer: Signature of Chairman

Name: Name: