

MSc Sem.-2 Examination

409

Bioinformatics

May-2025

[Max. Marks : 70]

Time : 2-30 Hours]

Qu1 : Answer the following :

- Briefly explain E-R Diagrams and its notations using examples (7)
- Draw an ER diagram for a University Database (7)
Entities: Student, Course, Instructor, Admission
 - Students can be admitted in multiple courses
 - Instructors teach multiple courses
 - Courses can have multiple students

OR

Qu1 : Answer the following :

- Briefly explain what are Database management Systems and its types. (7)
- Briefly explain the various normal forms in Normalization using examples. (7)

Qu2 : Answer the following :

- Briefly explain what is SQL and its command categories. Describe the SQL data types and the create table syntax using examples (7)
- Briefly explain the architecture of a DBMS (7)

OR

Qu2 : Answer the following :

- Briefly explain the insert, update and delete commands using examples. (7)
- Briefly explain the select command where clause and its operators with examples. (7)

Qu3 : Answer the following :

- Explain the structure and purpose of KEGG as a secondary database. How is it used in bioinformatics? (7)
- What is Swiss-Prot, and how does it function as a secondary protein sequence database? Discuss its features and applications. (7)

OR

Qu3 : Answer the following :

- What is the role of EMBL (European Molecular Biology Laboratory) as a primary database? Describe its key components and features. (7)
- Compare and contrast primary and secondary biological databases with examples. (7)

Qu4 : Answer the following :

- Briefly explain date and math functions in SQL. (7)
- Briefly explain the group by clause using examples. Explain the having clause with group by clause. (7)

OR

Qu4 : Answer the following :

- Briefly explain what are nested queries using examples (7)
- Briefly explain Data Mining and the data mining process (7)

Qu5 : Attempt any Seven:

(14)

1. Write the create table command for the following table

1	ProductID	Integer	PrimaryKey, autoincrement
2	Description	Varchar length 50	Not Null
3	Category	Enum	Consumer, Groceries , Specialized default Consumer
4	Price	Decimal 5, 2	Check price should be greater than 0

(P.T.O)

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2. Given the product table list unique categories
 3. Given the product table list the products sorted on the descending order of price
 4. Given the product table list all the products whose description begins with an A
 5. Given the product table list all the products in the price range 10 to 20
 6. Given the product table Products(ProdID, Desc, Type, Price) and Sales(ProdID, Date, Qty)
List ProdID, Description, Date and Qty from the products and sales table
 7. Given the employee table Employee(EmpID, Name, DeptID, Contact, Salary)
List the average salary in every department
 8. Describe the methods in supervised learning
 9. Which database stores Expressed Sequence Tags (ESTs)?
 10. What type of data is stored in the GSS (Genomic Sequence Survey) database?
 11. Which database is used for submitting next-generation sequencing (NGS) data.
 12. Explain CATH.
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