PG/IIIS/COS/304(M1 & M2)
/24(CBCS)

M.Sc. 3rd Semester Examination, 2024

COMPUTER SCIENCE

PAPER – COS-304 (M1 & M2) (CBCS)

Full Marks : 50

Time : 2 hours

Answer **all** questions

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

PAPER – COS-304 M1

(*DBMS*)

Full Marks : 25

GROUP–A

Answer any **two** questions : 2×2

1. Explain the difference between the Union and Set Difference operations in relational algebra.

2. Discuss the use of the foreign key in a relational database.

3. What is the role of Database Administrator ?

4. How would you create a new table in SQL with specific column constraints ?

GROUP–B

Answer any **two** questions : 4×2

5. Consider the following relational database :

employee (person name, street, city)
works (person name, company name, salary)
company (company name, city)

What are the appropriate **primary keys** ? Justify.

6. Consider the following two expressions, which use the result of a relational algebra operation as the input to another operation. For each expression, explain in words what the expression does.

(*a*) $\sigma_{year \geq 2020}$ (takes) × student

(*b*) $\sigma_{year \geq 2020}$ (takes × student)

7. Consider the following employee database where the primary keys are underlined :

employee (employee_name, street, city)
works (employee_name, company name, salary)
company (company_name, city)
manages (employee_name, manager name)

Give an expression in SQL for each of the following queries.

(*a*) Find the names, street addresses and cities of residence of all employees who work for "SBI" and earn more than Rs. 60,000.

(*b*) Find all employees in the database who earn more than each employee of "SBI".

8. What do understand by *aggregate function* in SQL ? Name the five aggregate function and explain the purpose of each of them with example.

GROUP – C

Answer any **one** question : 8×1

9. (*a*) Design an ER-diagram of Employee salary database and also mention type of association between entities. 4

   (*b*) Explain one to one, one to many and many to many relationships with example. 4

10. (*a*) What is transitive dependency ? Show with an example.

    (*b*) How do you remove transitive dependency ?

    (*c*) How is it related to Normalization ? 4 + 2 + 2

[Internal Assessment – 05 Marks]

PAPER – COS-304 M2

(*Internet Technology*)

Full Marks : 25

GROUP–A

Answer any **two** questions : 2×2

1. Define data communication.

2. Differentiate between ISO/OSI and TCP/IP models.

3. What is the use of <img>tag ? Also write its syntax.

4. How to create hyperlinks in HTML ?

GROUP–B

Answer any **two** questions : 4×2

5. Differentiate between different network topologies.

6. Compare the merits and demerits of classful addressing and classless addressing.

7. Define Table tag and their attributes with an example.

8. Write an HTML code for different types of item listing in HTML.

GROUP – C

Answer any **one** question : 8×1

9. Write short notes of the following (any *two*) : 4×2

   (*i*) Hub

   (*ii*) Gateway

   (*iii*) Repeater

10. Write an HTML program for an interactive student registration web page.

[Internal Assessment – 05 Marks]