

**RAMAKRISHNA MISSION VIDYAMANDIRA**  
(Residential Autonomous College affiliated to University of Calcutta)

SECOND YEAR [2018-21]  
B.A./B.Sc. THIRD SEMESTER (July – December) 2019  
Mid-Semester Examination, September 2019

Date : 17/09/2019  
Time : 11 am – 12 noon

**COMPUTER SCIENCE (General)**  
**Paper : III**

Full Marks : 25

**(Use a separate Answer Book for each group)**

**Group - A**

Answer **any one** question of the following:

(1 × 2.5 = 2.5)

1. Briefly discuss about Logical Independence and Physical Independence in DBMS. (2.5)
2. What do you mean by Generalization and Specialization. (2.5)

Answer **any two** questions of the following:

(5 × 2 = 10)

3. a) Briefly discuss about Network Model in DBMS. (2.5)
- b) Define the terms : partial key, descriptive attribute and total participation. (2.5)

4. Consider the Relational Schema

Student ( Roll, Name, Add )

Marks ( Roll, Marks, Subject )

Answer the following queries:

- i) Find the name of the students who secured subject-wise highest marks. (2.5)
  - ii) Find the student who secured second highest marks. (2.5)
5. a) Consider the following two relations.

R

A	B	C
a	b	c
d	a	f
b	b	d
d	b	c

S

B	C
a	f
b	c

Find out  $R \div S$ .

(2.5)

- b) What is the purpose of self join ?

(1)

Why outer join is needed ?

(1.5)

**Group - B**

Answer **any one** question of the following:

(1 × 2.5 = 2.5)

6. Using Euclidean algorithm, find the Greatest Common Divisor (G.C.D) of 45 and 75. (2.5)

7. Explain repudiation with example. (2.5)

Answer **any two** questions of the following: (5 × 2 = 10)

8. Encrypt the message “this is an exercise” using Affine cipher with key (15,20). Ignore spaces between words. (5)

9. Perform cryptanalysis of Hill cipher with respect to known plaintext attack. (5)

10. a) Write two disadvantages of CBC mode of operation. (2)

b) Differentiate between confusion and diffusion. (1)

c) Explain the term “perfect secrecy”. (2)

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