2018
COMPUTER SCIENCE- PAPER-II

Time Allowed : 3 Hours   Full Marks : 200

If the questions attempted are in excess of the prescribed number, only the questions attempted
first up to the prescribed number shall be valued and the remaining ones ignored.

Answers may be given either in <u>English</u> or in <u>Bengali</u> but all answers must be
in one and the same language.

Answer <u>any Five</u> Questions :

1. a)   What are the differences among DDL, DML and DCL in SQL ?   5

   b)   What is a view in SQL ? Give an example of creating a view.   5+5

   c)   What is a Trigger ? What is the difference between Trigger
        and Stored Procedure ?   5+5

   d)   What are the differences between INNER JOIN and FULL JOIN
        in SQL using illustrative examples.   10

   e)   What is the purpose of a commit statement in SQL ?   5

2. a)   What does functionall dependent mean ? What is trivial fun-
        ctional dependency ? Explain with examples.   4+4

   b)   Consider a relation R(A, B, C, D) having two sets of
        FD, $FD_1 = \{A \to B,\ B \to C,\ AB \to D\}$ and $FD_2 = \{A \to B,\ B \to C,\ A \to C,$
        $A \to D\}$. Establish whether these two FD sets are semantically
        equivalent or not.   12

   c)   Create using SQL a new table called **CUSTOMERS** and add five
        columns ID (Integer - 10 digits), NAME (20 characters), AGE
        (integer - 3 digits), ADDRESS (25 characters) and SALARY
        (in the format xxxxxx.xx), three of which (ID, NAME, AGE)
        shall not accept NULLs.   10

   d)   Write SQL statements for the following queries on CUSTOMERS
        (assuming it has been created with several tuples):

     i)   Display all the records from CUSTOMERS table where SALARY
          starts with Rs.200.

     ii) Delete complete data from CUSTOMERS without deleting the
          table.   5+5

3. a)   What do you understand by process and process table ? What
        are the different states of a process ?   8+6

   b)   What is a thread ? What are the differences between process
        and thread ?   8+8

   c)   What is a semaphore ? Explain with an illustrative example
        the role of a semaphore.   10

4. a)   What is spooling ? Explain. What are the advantages of
        spooling ?

b) Four processes are scheduled with shortest job first scheduling as follows :

Process	Arrival Time	Execution Time	Service Time
P0	0	5	3
P1	1	3	0
P2	2	8	16
P3	3	6	8

Find the wait time of each process and the average wait time.

4+4

c) What is a virtual memory ? What are the advantages of such a memory ?

6+6

d) Suppose the time to service a page fault is on the average 10 milliseconds and a memory access takes 1 microsecond. Find the average memory access time with a 99.99% hit ratio.

10

5. a) State the differences among Internet, Intranet, and Extranet.

8

b) What are IP classes and how can you identify the IP class of a given IP address ? What do you understand by Static IP and Dynamic IP ?

6+4

c) What is the purpose of line coding ? Discuss bipolar encoding with an appropriate illustration.

4+8

d) Compare and contrast : TCP and UDP.

10

6. a) Explain different types of Inheritance associated with Object Oriented Programming.

10

b) What are the differences between an Abstract Class and an Interface ?

8

c) What are the differences between Method Overloading and Method Overriding ?

10

d) Write a C++ Program to reverse an integer, e.g., if the input is 12345 the corresponding output will be 54321.

12

7. a) State the characteristics of the RISC Architecture. Compare it with CISC.

8

b) What are tri-state devices and why they are essential in a bus oriented system ?

10

c) Compare between SRAM and DRAM. Describe the memory hierarchy of a Computes System.

4+8

d) List and explain the different types of micro-operations.

10

8. Write short notes on :

a) Use of Finite State Machines in the design of Lexical Analyzers.

b) Video streaming through Internet.

c) Assemblers and Interpreters.

d) Additive and subtractive colors.