

2019

Part – II

COMPUTER SCIENCE

(Honours)

Paper – III

Full Marks – 90

Time : 4 Hours

The questions are of equal value for any group / half.

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.

GROUP – A

Answer any **two** questions : 15×2

1. (a) Explain the different phases involved in waterfall life cycle. 8
- (b) What are the purposes of Data Flow Diagrams, Entity-Relationship diagrams ? Give an example diagram of each. 7
2. (a) What is a Binary Tree ? What is the maximum number of nodes possible in a Binary Tree of depth d. 2+4=6

P.T.O.

- (b) Explain the following terms with respect to Binary trees (i) Strictly binary Tree (ii) Complete Binary Tree (iii) Almost Complete Binary Tree. $3+3+3=9$

3. (a) What do you mean by process ? draw the block diagram of process control block. Write down the different process states.

$1+2+2$

- (b) Consider the following Snapshot of jobs :

Process	Arrival time	Burst time
P_1	0	6
P_2	2	9
P_3	3	2
P_4	5	4

- (i) What is the average turn - around time for these processes with FCFS scheduling algorithm.

$2\frac{1}{2}$

- (ii) What is the average turn-around time for these processes with SJF scheduling algorithm.

$2\frac{1}{2}$

- (c) What is semaphore ? How can semaphore be used to enforce mutual exclusion. $2+3$

GROUP – B

Answer any **five** questions : 8×5

4. Explain the basic two techniques for Collision-resolution in Hashing with example. Also explain primary clustering.
5. Obtain an AVL tree by inserting one integer at a time in the following sequence.
150, 155, 160, 115, 110, 140, 120, 145, 130, 147, 170, 180. 8
6. What are the difference between pointers to constants and constant to pointers with example ?
7. (a) Explain operator overloading in C++. 3
(b) What are friend functions ? Explain with example. 3+2
8. (a) Write short note on feasibility studies for developing a project. 4
(b) Differentiate between Testing and Debugging. 4
9. (a) What do you mean by linear lined list ? 2
(b) Write Binary search algorithm and determine its complexity. Write down the limitation of Binary Search algorithm. 4+2
10. (a) Define the term queue. How a circular queue is implemented in a linear array ? 1+3

(b) What is starvation ? Explain the techniques to avoid starvation during scheduling. 2+2

11. (a) What is the difference between logical DFD and physical DFD. 4

(b) What is virtual function ? Give example. 4

GROUP – C

Answer any **five** questions : 4×5=20

12. Write a procedure to insert a node in a linked list at a specified position. 4

13. Differentiate between black box testing and white box testing. 4

14. Explain the term "Quality Assurance". 4

15. What do you mean by parameterized constructor ? Give example. 4

16. Discuss with examples, the implications of deriving a class from an existing class by the 'public' and protected' access specifiers. 4

17. Explain the use of Critical section. 4

18. What is system Call ? What is Semaphore ? 4

19. What is Garbage collection ? 4

[Internal Assessment - 10]