Roll No. | | | | | | | | | | | | | **Total No. of Pages: 02**

Total No. of Questions: 07

B.Sc.(IT) (2015 & Onwards) (Sem. – 3)

OPERATING SYSTEMS

M Code: 74061

Subject Code: BSIT-303

Paper ID: [74061]

Time: 3 Hrs. **Max. Marks: 60**

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.**

SECTION A

1. a) Define Operating System. List the objectives of an operating system.

   b) With a neat diagram, explain various states of a process.

   c) Distinguish between Logical and Physical address space.

   d) Describe the differences among short-term, medium-term, and long-term scheduling.

   e) What are the disadvantages of single contiguous memory allocation?

   f) What is Denial of Service, firewall?

   g) Difference between serial access devices and direct access devices.

   h) What are the advantages of inter-process communication?

   i) Explain how multiprogramming increases the utilization of CPU.

   j) What is the purpose of Paging and Page tables?

SECTION B

2. Explain the following terms with suitable examples of operating systems:

   a) multiprogramming

   b) multiprocessing

   c) time sharing

   d) multiuser operating systems

3. Define a Thread? Give the benefits of multithreading. What resources are used when a thread is created? How do they differ from those used when a process is created?

4. Consider the following set of processes (P1, P2, P3, P4 and P5), with the length of the CPU burst time given in milliseconds:

Process	Arrival time	CPU Burst	Priority
P1	0	3	3
P2	1	7	5
P3	3	5	2
P4	4	2	4
P5	7	6	1

   Give the Gantt chart, waiting time, average waiting time and average turnaround time for the following indicated scheduling algorithm

   a) Non Preemptive Shortest Job First

   b) Preemptive Priority

   c) Round Robin (time quantum = 4)

   d) First Come First Served

   Note: Ignore context switching overhead. A small value means a higher priority. (Show your work)

5. What are the advantages of inter-process communication? How communication takes place in a shared-memory environment? Explain.

6. a) What is a page fault Explain the steps involved in handling a page fault with a neat sketch

   b) Consider the following page reference string: 1,2,3,4,2,1,5,.6,2,1,2,3,7,6,3,2,1,2,3,6 How many page faults would occur for the optimal page replacement algorithm, assuming three frames and all frames are initially empty.

7. What do you mean by directory structure? Discuss different types of directory structures.