2022
B.A./B.Sc.
First Semester
CORE – 6
COMPUTER SCIENCE
Course Code: CSC 3.21
(Operating Systems)

Total Mark: 70 *Pass Mark: 28*
Time: 3 hours

Answer five *questions, taking* one *from each unit.*

UNIT–I

1. (a) What is an operating system (OS)? Explain some important functions of OS. 1+5=6
   (b) List the differences between system software and application software. 5
   (c) Write short notes on real-time systems. 3

2. (a) Explain with illustrations the different types of operating system. 10
   (b) What are the differences between 32-bit and 64-bit operating systems? 4

UNIT–II

3. (a) Define kernel. What are the different types of kernels? 1+5=6
   (b) Differentiate between user mode and kernel mode. 5
   (c) What are privileged and non-privileged instructions? 3

4. (a) What is a system call? Explain the fork() system call with an example. 1+3=4
   (b) Explain the components and architecture of a Linux OS. 10

UNIT–III

5. (a) Define a process. Explain the process life cycle with a diagram. 1+5=6

(b) What do you mean by deadlock? Write a note on deadlock detection and recovery. 1+3=4

(c) Write a note on process control block (PCB). 4

6. (a) What is a thread? Explain the types of threads. 1+4=5

(b) What do you mean by preemptive and non-preemptive scheduling? 4

(c) Using round-robin scheduling algorithm with time quantum 3, calculate the waiting time and turn-around time for the following processes: 5

Processes	Arrival Time	Burst Time
P1	0	8
P2	5	2
P3	1	7
P4	6	3
P5	8	5

UNIT–IV

7. (a) Explain the difference between logical and physical address space in OS. 5

(b) What is fixed and variable partitioning in OS? 4

(c) What is fragmentation? What are the two types of fragmentation? 1+4=5

8. (a) Explain paging and segmentation in OS. 8

(b) What is virtual memory? How does virtual memory work? 1+2=3

(c) List the advantages and disadvantages of virtual memory. 3

UNIT–V

9. (a) What is a directory? Explain the different logical structures of a directory. 1+9=10

(b) Explain any two file operations provided by the OS. 4

10. (a) What is a file? Explain the file allocation methods. 1+10=11

(b) What are the three types of OS peripheral devices? 3