3 (Sem–3/CBCS) CSC HC 2

2023

COMPUTER SCIENCE

(Honours Core)

Paper : CSC–HC–3026

(Operating System)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions as directed : 1×7=7

   (a) The heart of any operating system is the set of system calls that it can handle. *(State True **or** False)*

   (b) _____ system call is used to create a child process identical to the parent. *(Fill in the blank)*

   (c) Threads are useful on systems with multiple CPUs, where real parallelism is possible. *(State True **or** False)*

(d) Threads can be implemented in user space or in the Kernel.
*(State True **or** False)*

(e) First-Come First-Served is a _____ scheduling algorithm.

(i) nonpreemptive

(ii) Preemptive
(Choose the correct option)

(f) When swapping is used, the system can handle more processes than it has room for in memory. *(State True **or** False)*

(g) In any secure system users must be authenticated. *(State True **or** False)*

2. Define the following terms : 2×4=8

(a) Kernels

(b) Threads

(c) Virtual address space

(d) Paging

3. Answer ***any three*** of the following questions : 5×3=15

(a) State the basic functions of operating system.

(b) What is system call ? Give example of *any five* system call.

(c) What are the differences between hard link and soft link ?

(d) What are the differences between process and thread ?

(e) Write in brief about Hierarchical Directory Systems.

4. Answer ***any three*** of the following questions : 10×3=30

(a) Give description of different types of operating system.

(b) What is Dining Philosophers Problem ? Describe the solution of it using semaphore.

(c) The arrival time and burst time of six processes are shown below: 5+5=10

Process ID	Arrival Time	Burst Time
1	0	5
2	1	6
3	2	3
4	3	1
5	4	5
6	6	4

Calculate completion time, waiting time and turnaround time for the processes if Round Robin Scheduling algorithm is used. Time quantum of the system is 3 units.

(d) What is deadlock? What are the necessary and sufficient conditions for deadlock? Explain.

(e) Describe *any two* file allocation methods.

(f) Write short notes on:

(i) security policy mechanism

(ii) device driver
