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

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