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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

MID TERM EXAMINATION SUMMER SEMESTER 2018

B.Tech Summer Semester

COURSE CODE: 10B11CI511

MAX. MARKS: 50

COURSE NAME: OPERATING SYSTEMS

COURSE CREDITS: 04

MAX. TIME: 2 Hrs

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

1. (a) Explain in detail how an operating system boots up?
(b) Discuss the concept of memory hierarchy in detail highlighting the need for it?
[5+5]
2. (a) What are the various services provided by an OS?
(b) What do you understand by the term system calls? How a system call is implemented?
What are the various types of system calls in an OS?
[3+7]
3. (a) Explain the difference between the monolithic kernel and microkernel?
(b) What is a process control block?
(c) How the communication between the different processes takes place?
[3+3+4]
4. (a) What are the various types of schedulers in an OS?
(b) Consider the following processes with arrival time and burst time. Calculate the average turnaround time and the average waiting time using round robin scheduling with time quantum 1, 3 and 5? What conclusion can be inferred from these results?

Process	Arrival time	Burst time
P1	5	5
P2	4	6
P3	3	7
P4	1	9
P5	2	2
P6	6	3

[3+7]

5. (a) Explain the Banker's Algorithm in detail.

(b) Considering a system with five processes P_0 through P_4 and three resources types A, B and C. Resource type A has 10 instances, B has 5 instances and type C has 7 instances.

Suppose at time t_0 following snapshot of the system has been taken:

Process	Allocation A B C	Max A B C	Available A B C
P_0	0 1 0	7 5 3	3 3 2
P_1	2 0 0	3 2 2	
P_2	3 0 2	9 0 2	
P_3	2 1 1	2 2 2	
P_4	0 0 2	4 3 3	

i) Is the system in safe state? If yes, then what is the safe sequence?

ii) What will happen if process P_1 requests one additional instance of resource type A and two instances of resource type C?

[5+5]