

United College of Engineering and Research, Allahabad**Operating System****B. Tech (4th Semester) CSE & IT****First Sessional Exam, 2016-17**

Time: 2 hours

Max Marks: 30

Section A**Attempt All Questions in section A****(10x1=10)**

1. What is an operating system? Define the components of an operating system.
2. What are the desirable and essential characteristics of an operating system?
3. List the various steps involved in booting.
4. List the various types of operating system.
5. Write a short note on multiprogramming operating system.
6. Differentiate between Process and Thread.
7. List any four services provided by the operating system.
8. Draw the labeled process state transition diagram.
9. What are long term scheduler and short term scheduler?
10. What are I/O bound processes and CPU bound processes.

Section B**Attempt Any three Questions from section B****(4x3=12)**

1. What is multiprocessing operating system? Differentiate between SMP & AMP.
2. What is Real Time operating system? What is the difference between hard real time & soft real time operating system?
3. Explain in brief the layered structure of an operating system.
4. Explain the various performance criteria for CPU scheduling algorithm.
5. Draw & explain Process Control Block (PCB) with all its components. Also brief why context switching is an overhead in the system?

Section C**Attempt Any one Questions from section C****(8x1=8)**

1. Five processes A, B, C, D and E require CPU burst of 3, 5, 2, 5 and 5 units respectively. Their arrival times in the system are 0, 1, 3, 9 and 12 respectively. Draw Gantt chart and compute the average waiting time and average turnaround time of these processes for the Shortest Job First (SJF) and Shortest Remaining Time First (SRTF) scheduling algorithms.
2. Consider the set of processes given in the table and draw the Gantt chart and find out the average waiting time and average turnaround time for following scheduling algorithms. (Note: larger priority number has higher priority).
 - (a) Round Robin (time quantum=3)
 - (b) Priority (non-preemptive)

Process Id	Arrival Time	Execution Time	Priority
P0	0	5	4
P1	2	4	2
P2	2	2	6
P3	4	4	3