Total No. of Questions :6]

SEAT No. : ____

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TE/INSEM./OCT.-145

T.E. (Information Technology)

OPERATING SYSTEM

(2015 Pattern) (Semester - I)

Time : 1 Hour] ***[Max. Marks :30***

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) What is operating system? State and explain the basic functions of Operating System. **[6]**

b) Explain the following shell commands with example: **[4]**

i) echo ii) grep iii) touch iv) ls

OR

Q2) a) Differentiate between monolithic and microkernel architectures. **[4]**

b) Write a shell script to check if given string is a palindrome or not. **[6]**

Q3) a) For the table given below, calculate average waiting time and average turnaround time and draw a Gantt Chart illustrating the process execution using following scheduling algorithms. **[8]**

i) Round Robin (time slice - 2 units) ii) Priority (non-preemptive)

Process	Arrival Time	Burst Time	Priority
P1	0	3	5
P2	2	6	2
P3	4	4	4
P4	6	5	3
P5	8	2	1

Note: For priority scheduling, minimum value indicates higher priority.

P.T.O.

b) Suppose that a process spawns another process using fork system call. **[2]**
What if the parent process completes the execution before child process?
What if the child process completes the execution before parent process?

OR

Q4) a) For the table given below, calculate average waiting time and average turnaround time and draw a Gantt Chart illustrating the process execution using following scheduling algorithms. **[8]**

i) SJF (non-preemptive) ii) Priority (Preemptive)

Process	Arrival Time	Burst Time	Priority
P1	0	9	3
P2	1	1	2
P3	2	7	1
P4	3	1	5
P5	4	6	4

Note: For priority scheduling, minimum value indicates higher priority.

b) Differentiate between user level and kernel level threads. **[2]**

Q5) a) Explain the following terms: **[6]**
i) Mutual Exclusion
ii) Synchronization
iii) Race condition

b) Differentiate between named pipe and unnamed pipe. **[4]**

OR

Q6) a) Write a deadlock-free solution for dining philosophers problem using semaphore. **[6]**

b) Explain the necessary and sufficient conditions for the occurrence of a deadlock. **[4]**