

Total No. of Questions :6]

SEAT No. :

P75

[Total No. of Pages :3

Oct./ TE/ Insem. - 194

T.E. (Information Technology)

OPERATING SYSTEM

(2015 Course) (Semester - I) (314444)

Time : 1 Hour]

[Max. Marks :30

Instructions to the candidates:

- 1) *Answers 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 side indicate full marks.*
- 4) *Assume suitable data, if necessary.*

Q1) a) Write C program for fork system call in which main program accept the array, parent process sort and display the element in ascending order whereas child process sort and print elements in descending order by using any sorting strategy. **[6]**

b) Explain the difference between the monolithic kernel and a microkernel with advantages and disadvantages. **[4]**

OR

Q2) a) Explain the concept of virtual machine with its implementation and benefits. Also explain example of virtual machine. **[6]**

b) State and explain different services provided by an operating system. **[4]**

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

- i) RR (Time slice -2 units)
- ii) SJF (non-preemptive)

Process	Arrival Time	Burst time
P1	0	10
P2	1	06
P3	2	12
P4	3	15

P.T.O.

- b) How PCB helps in process management? Explain the structure of PCB. [2]

OR

- Q4) a) For the table given below calculate the average waiting time and average turn around time and draw a Gantt Chart illustrating the process execution using following scheduling algorithms.

- i) RR (Time slice - 2 units) [8]
 ii) FCFS

Process	Arrival Time	Burst time
P1	0	4
P2	1	5
P3	2	2
P4	3	1
P5	4	6
P6	6	3

- b) Differentiate between thread and process. [2]

- Q5) a) Consider the following snapshot of a system: [6]

	Allocation				Maximum				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Answer the following question using banker's algorithm.

- i) What are the contents of need matrix?
 ii) Is system in a safe state?

- b) Write a Semaphore solution for reader-writer problem. [4]

OR

- Q6) a) What is busy waiting with respect to process synchronization? Explain how semaphore solves problem of synchronization. [6]
- b) How resource allocation graph helps to deadlock? Write the necessary conditions of deadlock to be occurred. [4]

