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Fifth Semester B.E. Degree Examination, June/July 2017
Operating Systems

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

1.
 - a. What is operating system? Explain multiprogramming and time sharing systems. (06 Marks)
 - b. Explain dual mode operation in OS with a neat block diagram. (04 Marks)
 - c. What are system calls? Briefly point out its types. (04 Marks)
 - d. What are virtual machines? Explain with block diagram. Point out its benefits. (06 Marks)
2.
 - a. Why is it important for the scheduler to distinguish I/O bound programs from CPU bound programs? (02 Marks)
 - b. What is interprocess communication? Explain its types. (06 Marks)
 - c. Consider the following set of processes, with the length of the CPU burst given in milliseconds.

Process	Burst time	Priority
P ₁	10	3
P ₂	1	1
P ₃	2	3
P ₄	1	4
P ₅	5	2

The processes are assumed to have arrived in the order P₁, P₂, P₃, P₄, P₅ all at time 0.

- (i) Draw the Gantt charts for the following scheduling algorithms, FCFS, SJF and RR (quantum = 1)
 - (ii) Find out turn around time and waiting time of each process for each of these scheduling algorithm and also find out average turn around time and average waiting time. (12 Marks)
3.
 - a. Define Semaphores. Explain its usage and implementation. (06 Marks)
 - b. What are monitors? Explain its usage and implementation. (08 Marks)
 - c. Explain Dining philosophers solution using monitors. (06 Marks)
 4.
 - a. What are deadlocks? What are its characteristics? (05 Marks)
 - b. Consider the following snapshot of a system:

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P ₀	0	0	1	2	0	0	1	2	1	5	2	0
P ₁	1	0	0	0	1	7	5	0				
P ₂	1	3	5	4	2	3	5	6				
P ₃	0	6	3	2	0	6	5	2				
P ₄	0	0	1	4	0	6	5	6				

 - (i) Find out need matrix. (02 Marks)
 - (ii) If a request from process P₁ arrived for (0, 4, 2, 0) can the request be granted immediately? (02 Marks)
 - (iii) Is the system in a safe state? (06 Marks)
 - c. Explain the process of recovery from deadlock. (05 Marks)

PART – B

- 5 a. Explain the multistep processing of a user program with a neat block diagram. (05 Marks)
 b. Distinguish between internal and external fragmentation. (02 Marks)
 c. Explain segmentation with an example. (06 Marks)
 d. Consider the following segment table:

Segment	Base	Length
0	219	600
1	2300	14
2		
90	100	
3	1327	580
4	1952	96

What are the physical addresses for the following logical addresses?

- (i) 0, 430 (ii) 1, 10 (iii) 2, 500 (iv) 3, 400 (v) 4, 112
 (07 Marks)
- 6 a. Explain briefly the various operations performed on files. (06 Marks)
 b. Explain the various access method of files. (06 Marks)
 c. Explain various allocation methods in implementing file systems. (08 Marks)
- 7 a. Explain the various Disk Scheduling algorithms with example. (10 Marks)
 b. Point out and explain briefly the problems with RAID. (05 Marks)
 c. Explain Access Matrix method of system protection. (05 Marks)
- 8 a. Explain the various components of a Linux system. (06 Marks)
 b. Explain process scheduling in a linux system. (06 Marks)
 c. Explain file systems implementation in linux. (08 Marks)

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