Hall Ticket Number:

II/IV B.Tech (Supplementary) DEGREE EXAMINATION

April, 2018   **Common to CSE & IT**
Third Semester   **Operating Systems**
Time: Three Hours   **Maximum :** 60 Marks

Answer Question No.1 compulsorily.   (1X12 = 12 Marks)

Answer ONE question from each unit.   (4X12=48 Marks)

1. Answer all questions   (1X12=12 Marks)
    a) What is an operating system?
    b) Define a thread.
    c) What is a semaphore?
    d) What is a safe state?
    e) Define a dirty bit.
    f) What is thrashing?
    g) List out file properties.
    h) Define a directory.
    i) Distinguish between seek time and latency time.
    j) What is the role of device controller?
    k) What is a free-space management?
    l) What is compaction?

UNIT I

2. a) Explain about the Evolution of operating systems.   6M
    b) What are the main functions of Operating System? Explain them   6M

(OR)

3. a) Define a Process. Describe Process State transition diagram with a neat sketch.   6M
    b) List and describe different types of schedulers.   6M

UNIT II

4. a) Compare preemptive Scheduling and non-preemptive scheduling.   6M
    b) Consider the following set of processes, with the length of the CPU burst given in
        milliseconds:

Process	CPU Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

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

   i.   Draw four Gantt charts that illustrate the execution of these processes using the
        following scheduling algorithms: FCFS, SJF, non-preemptive priority (a smaller   6M
        priority number implies a higher priority), and RR (quantum = 1).
   ii. What is the turnaround time of each process for each of the scheduling algorithms in
        part i?
   iii. What is the waiting time of each process for each of the scheduling algorithms in
        part i?

(OR)

5. a) Explain the concept of Monitors.   6M
    b) Write and explain Producer - Consumer classical synchronization problem.   6M

UNIT III

6. a) Describe First-fit, Best-fit and Worst-fit algorithms   6M
   b) Describe necessary conditions for deadlock occurrence.   6M

(OR)

7. a) Describe the demand-paging Memory Management technique.   6M
   b) Describe Page Replacement algorithms with an example.   6M

UNIT IV

8. a) What is a file? What are the different operations that can be performed on a file?   6M
   b) Discuss in detail about file accessing methods.   6M

(OR)

9. Explain the following.   12M
        i)Application I/O interface   ii) Kernel I/O subsystem

Scheme of Valuation

14CS 304

Hall Ticket Number:

Answer Question No.1 compulsorily. (1X12 = 12 Marks)

Answer ONE question from each unit. (4X12=48 Marks)

1		Answer all questions	(1X12=12 Marks)
	a)	What is an operating system?	1M
	b)	Define a thread.	1M
	c)	What is a semaphore?	1M
	d)	What is a safe state?	1M
	e)	Define a dirty bit.	1M
	f)	What is thrashing?	1M
	g)	List out file operations.	1M
	h)	Define a directory.	1M
	i)	Distinguish between seek time and latency time.	1M
	j)	What is the role of device controller?	1M
	k)	What is a free-space management?	1M
	l)	What is compaction?	1M
		UNIT I	
2	a)	Explain about the Evolution of operating systems. Briefly explain any 4 of the following 　　i)　　Serial Processing 　　ii)　　Batch Processing 　　iii)　　Multiprogramming 　　iv)　　Timesharing 　　v)　　Real-Time 　　vi)　　Parallel Processing 　　vii)　　Distributed Processing	6M
	b)	What are the main functions of Operating System? Explain them Briefly explain the following 　　i)　　Processor Management 　　ii)　　Memory Management 　　iii)　　I/O Management 　　iv)　　File Management	6M
		(OR)	
3	a)	Define a Process. Describe Process State transition diagram with a neat sketch. Definition of a process　　　2M Diagram　　　　　　　　　2M Description of States　　　　2M	6M
	b)	List and describe different types of schedulers. Three type 　　i)　　Long-term Scheduler 　　ii)　　Medium-term Scheduler 　　iii)　　Short-term Scheduler　　3X2 = 6M	6M
		UNIT II	
4	a)	Compare preemptive Scheduling and non-preemptive scheduling. Preemptive Scheduling　　3M	6M

		Non-preemptive 3M	
	b)	Consider the following set of processes, with the length of the CPU burst given in milliseconds:	6M

<table>
<tr><th>Process</th><th>CPU Burst Time</th><th>Priority</th></tr>
<tr><td>P1</td><td>10</td><td>3</td></tr>
<tr><td>P2</td><td>1</td><td>1</td></tr>
<tr><td>P3</td><td>2</td><td>3</td></tr>
<tr><td>P4</td><td>1</td><td>4</td></tr>
<tr><td>P5</td><td>5</td><td>2</td></tr>
</table>

The processes are assumed to have arrived in the order P1, P2/ P3, P4, P5, all at time 0.
  i.   Draw four Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF, non-preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1).
  ii.   What is the turnaround time of each process for each of the scheduling algorithms in part i?
  iii. What is the waiting time of each process for each of the scheduling algorithms in part i?
  3X2   =6M

		(OR)	
5	a)	Explain the concept of Monitors. Definition of monitor 2M Concept of it with example 4M	6M
	b)	Write and explain Producer - Consumer classical synchronization problem. Algorithm 4M Explanation 2M	6M

UNIT III

6	a)	Describe First-fit, Best-fit and Worst-fit algorithms 3X2=6M	6M
	b)	Describe necessary conditions for deadlock occurrence. Need to explain the following 　i)　　Mutual exclusion 　ii)　　Hold & Wait 　iii)　　No preemption 　iv)　　Circular wait	6M

		(OR)	
7	a)	Describe the demand-paging Memory Management technique. Concept of it and explanation with neat diagrams	6M
	b)	Describe Page Replacement algorithms with an example. Need to explain the following with examples 　i)　　FIFO 　ii)　　LRU 　iii)　　Optimal 3X2=6M	6M

UNIT IV

8	a)	What is a file? What are the different operations that can be performed on a file? Definition of file wit its importance	6M
	b)	Discuss in detail about file accessing methods.	6M

		(OR)	
9		Explain the following. 　　i)Application I/O interface ii) Kernel I/O subsystem	12 M