



B.Tech IV Year I Semester Regular Examinations, December 2024
Operating Systems

(ECE)

Maximum Marks: 70

Date:30.12.2024

Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks **(10x2M=20 Marks)**

1	Define operating system?
2	List any four types of system calls?
3	Distinguish between thread with process?
4	Describe entry and exit sections of a critical section?
5	What is safe state?
6	Define swapping?
7	Explain the need for page-replacement.?
8	Differentiate demand paging and pure demand paging?
9	Explain Access control?
10	Discuss goals of protection.

Part-B

Answer All the following questions. **(10M X 5=50Marks)**

11	a) Define an operating system? State and explain the basic functions or services of an operating system? [5M] b) Explain the differences between multiprogramming and time-sharing systems? [5M]																		
OR																			
12	Discuss the different structures of OS? [10M]																		
13	A scheduling mechanism should consider various scheduling criteria to realize the scheduling objectives? List out all the criteria. [10M]																		
OR																			
14	Consider the following set of processes with the length of the CPU burst time given in milliseconds [10M] <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Process</th> <th style="text-align: left;">BurstTime</th> <th style="text-align: left;">Priority</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>The processes are assumed to have arrived in the order p1, p2, p3, p4, p5 all at time 0.</p> a) Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, anon pre-emptive priority (a smaller priority number implies a higher priority) and RR (quantum=1) scheduling.	Process	BurstTime	Priority	P1	10	3	P2	1	1	P3	2	3	P4	1	4	P5	5	2
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	<p>b) What is the turnaround time of each process for each of the scheduling algorithms in part?</p> <p>c) What is the waiting time of each process for each of the scheduling algorithms in part? Which of the schedules in part a results in the minimal average waiting time?</p>	
15	Compare Optimal, LRU and FIFO page replacement algorithms with illustration. [10M]	
	OR	
16	Illustrate the use of Banker's Algorithm for Deadlock Avoidance	[10M]
17	Discuss following system calls for file operations:	[10M]
	<p>i) Open()</p> <p>ii) Read()</p> <p>iii) Write()</p> <p>iv) Close()</p> <p>v) Seek()</p>	
	OR	
18	Summarize the basic Scheme of page replacement and about the various page replacement strategies with examples?	[10M]
19	Explain the following in detail with respect to disk?	[10M]
	<p>a) Seek time</p> <p>b) Latency</p> <p>c) Access time</p> <p>d) Transfer time</p>	
	OR	
20	<p>a) What is the linked list allocation file implementation technique?</p> <p>b) State the Access metrics mechanism</p>	<p>[5M]</p> <p>[5M]</p>