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Operating Systems

P. Pages : 2

Time : Three Hours


NRT/KS/19/3496

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) What is an operating system? List out different types of O. S. 7
- b) What is meant by system call? How it is used by application during execution. 6

OR

2. a) What are different services provided by O. S.? 6
- b) Write a short note on spooling. 4
- c) What is user & system view of O. S.? 3

3. a) What are the various file allocation methods? Explain each with their merits & demerits. 7
- b) What are different file access techniques? 6

OR

4. a) Suppose the head of moving disk with 200 cylinders and is currently at track 60ft the queue of a request is kept in order as 65, 170, 35, 120, 10, 140. What are the total head movements to satisfy the request for the scheme? 9
 - i) FCFS ii) SSTF
 - iii) SCAN iv) C-SCAN
 - v) LOOK vi) C-LOOK
- b) Explain various operations associated with file. 4

5. a) Explain CPU scheduling criteria. 5
- b) Consider the following set & processes. 9

Process	CPU Burst Time	Arrival Time	Priority
P ₁	3ms	0	3
P ₂	5ms	1	1
P ₃	2ms	2	2
P ₄	5ms	3	5
P ₅	5ms	4	4

Calculate the average waiting time & turn around time for each.

- i) FCFS ii) SJF
- iii) Priority iv) RR (time slice = 2)

OR

- 6 a) What are threads. Explain various multithreading models. 5
- b) Differentiate between process & thread. 3
- c) What are different types of schedulers present in the system? Explain in detail. 6
7. a) Consider the following page reference string 8 2 4 1 8 2 5 8 2 1 5 3 4 6 7 . 7
Assume frame size = 3 calculate page fault for:
i) FIFO ii) LRU iii) Optimal
- b) Explain the concept of paging & segmentation. 7
- OR**
8. a) Explain: 3
i) Thrashing 3
ii) Swapping 4
iii) Internal & External fragmentation 4
iv) Demand Paging
9. a) What is critical section? Explain in detail. 7
b) Explain Dining Philosophers Problem? 6
- OR**
10. a) Explain Readers – Writers problem. 7
b) Explain Semaphore & Monitor 6
11. a) Consider the following snapshot of system. 10
- | Process | 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 | | | | |
- Answer the following questions using Bankers algorithms
- i) What is the content of need matrix?
- ii) Is the system in safe state ?
- iii) If a request from process P₁ arrives for (0, 4, 2, 0) can the request be granted immediately? Why?
- b) What is deadlock? What are necessary conditions for a deadlock to arise. 3
- OR**
12. a) What is an Access matrix? Describe various methods to implement an Access matrix. 7
b) Explain Capability list in detail. 6



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The best time to plant a tree was 20 years ago. The second best time is now.

~ Chinese Proverb

