

**Operating System**

P. Pages : 3

Time : Three Hours

**KNT/KW/16/7509**

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. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) What is operating system? Explain various types of operating system. 9
- b) Explain various file allocation methods. 5
- OR**
2. a) Explain various services provided by operating system. 6
- b) What is system call? Explain various types of system calls. 6
- c) Explain various file operations. 2
3. a) Explain various scheduling criteria. 4
- b) Consider the following snapshot of the system. 9

Process	Arrival Time	CPU Burst	Priority
A	0	10	5 (Low)
B	1	6	4
C	3	2	2
D	5	4	0 (high)

Calculate average waiting time, average turn around time and average response time using

- i) FCFS ii) SRTF
- iii) PP iv) PNP

**OR**

4. a) Explain : 6
- i) Process states
- ii) Process Control block

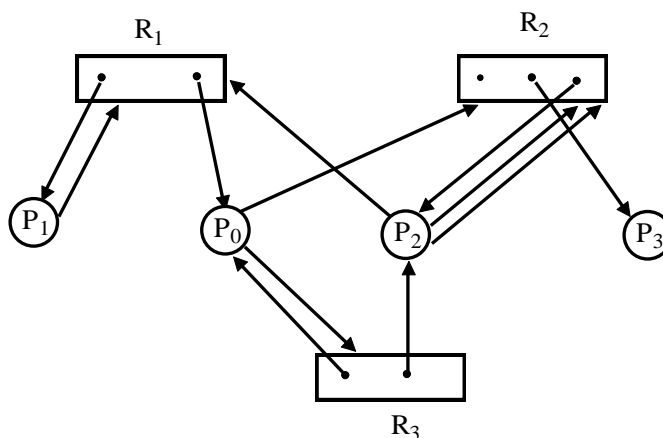
- b) Explain various multithreading models. 7
- 5. a) What is critical section problem? Explain the solutions to solve the problem in brief. 6
- b) What is Semaphore? Explain the solution of dining – philosophers problem using semaphore. 7

**OR**

- 6. a) What is Race condition? Explain Reader's Writers problem. 7
- b) Explain : 6
  - i) Monitor
  - ii) Peterson's solution
- 7. a) Explain the four necessary conditions for deadlock. 4
- b) Explain : 4
  - i) RAG
  - ii) WFG
- c) Explain RAID structure. 3
- d) Explain SCAN and LOOK disk scheduling algorithm. 3

**OR**

- 8. a) Implement disk scheduling algorithm (SSTF, SCAN and C LOOK) for the following cylinder requests considering current head position at 53 and calculate to head movements. 67, 65, 124, 16, 120, 37, 183, 98 cylinders having range from 0 to 200. 6
- b) Consider the following resource allocation graph and find whether the system is in safe state or not. If yes what is the safe sequence. 5



- c) State and explain deadlock prevention method in brief. 3

9. a) Differentiate between fixed partitioning and variable partitioning with example. 6  
b) Explain the virtual memory organization and also explain thrashing. 5  
c) What is paging. 2

**OR**

10. a) Consider the following page reference string. 7  
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6  
How many page faults would occur for  
i) LRU ii) FIFO  
iii) Optimal

Consider 3 frames in memory.

- b) Explain various types of page table structures. 6
11. a) Explain : 6  
i) Goals of protection  
ii) Principles of protection  
iii) Domain of protection
- b) Explain cryptography as security tool. 7

**OR**

- 12 Write short note on **any three**. 13  
a) Access Matrix & its implementation.  
b) Language base protection.  
c) System and Network threats  
d) Virus & Worms.

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