Question Paper Code : 8374

B.Tech. (5th) (Odd Semester) Examination, 2021

CONCEPTS OF OPERATING SYSTEM

[Paper : CS-501]

Time : Three Hours] **[Maximum Marks : 70**

Note : Answer **any five** questions. All questions carry equal marks.

1. Justify the statement "Operating system can be viewed as a government, resource allocator and a control program". [14]

2. Attempt all parts :

   (i) List out different services of Operating System and explain each service. [7]

   (ii) Explain the layered approach of the operating system. [7]

3. Attempt all parts :

   (i) What is the difference between a preemptive and non-preemptive scheduling algorithms ? [7]

(ii) Explain FCFS scheduling algorithm. Find the average turn around time and average waiting time for the processes given in the table below. Assume that all processes arrived at time O. [7]

Process	CPU burst time (in ms)
P1	24
P2	3
P3	3

4. Consider the following data with burst time given in milliseconds :

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

The process has arrived in the order p1,p2,p3,p4,p5 all at time 0.

(i) Draw Gantt charts for the execution of these processes using FCFS, non-preemptive SJF, a non-preemptive priority and round robin (quantum=1) scheduling. [7]

(ii) What is the turn around time and waiting time of each process for non-preemptive SJF and Round Robin scheduling algorithm ? [7]

5. Attempt all parts :

(i) Why is deadlock state more critical than starvation? Describe resource allocation graph with a deadlock, with a cycle but no deadlock. [7]

(ii) Describe necessary conditions for a deadlock situation to arise. Explain the methods for deadlock prevention. [7]

6. Given 3 processes A, B and C, three resources x, y and z and following events : [14]

(i) A requests x

(ii) A requests y

(iii) B requests y

(iv) B requests z

(v) C requests z

(vi) C requests x

(vii) C requests y

Assume that requested resources should always be allocated to the request process if it is available. Draw the resource allocation graph for the sequences and also mention whether it is a deadlock. If it is, how to recover the deadlock ?

7. Attempt all parts :

(i) What is Paging and Swapping ? With a diagram discuss the steps involved in handling a page fault. [7]

(ii) Consider the reference stream 1,2,3,4,1,5,6,2,1, 2,3,7,6,3,2,1,2,3,6. How many page faults while using FCFS and LRU using 3 frames ? [7]

8. (i) What is Address Binding ? Explain the concept of dynamic relocation of addresses. [7]

(ii) Memory partitions of 100kb, 500kb, 200kb, 300kb, 600kb is available how would best, worst, first fit algorithm to place processes 212,417,112,426 in order. Which is the best algorithm ? [7]

9. Explain physical and logical address. Consider a logical address space of 8 pages of 1024 words each, mapped on to a physical memory of 32 frames. How many bits are there in the logical address ? How many bits are there in the physical address ? [14]

10. Attempt all parts :

(i) Describe the SSTF disk scheduling algorithm using the following data. The disk head is initially at position-cylinder 53. The cylinder sequence of requests is 98,183,37,122,14,124, 65, 67. Find the total head movement. [7]

(ii) Differentiate between protection and security in file system. How they are implemented ? [7]

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