Sr. No. of Question Paper : 7275   J

Unique Paper Code   : 42344304

Name of the Paper   : Operating Systems

Name of the Course   : **B.Sc. (Prog.) / B.Sc. Math. Sciences**

Semester   : III

Duration : 3 Hours   Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.

2. Question No. **1** is compulsory.

3. Attempt any **five** from remaining seven questions.

4. All parts of a question must be done together.

1. (a) Name two services provided by operating system. (2)

   (b) How does an operating system prevent the CPU from being infinitely over run by user program? (2)

P.T.O.

(c) Differentiate between pre-emptive and non pre-emptive scheduling. (3)

(d) List two system calls each used for process control, file management and device management. (3)

(e) Differentiate between multiprogramming and multiprocessing. (3)

(f) What is use of a page table in paging memory management? (3)

(g) What is address binding? (3)

(h) Explain different commands to compare files in unix operating system. (3)

(i) List three benefits of "the ability of operating system to execute a program that is only partially in memory". (3)

2. (a) Consider the following set of processes, with the length of the CPU burst times given in milliseconds : (3×2=6)

Process	Burst Time	Priority	Arrival Time
P1	8	3	0.0
P2	4	2	0.4
P3	1	1	1.0

      (i) Draw Gantt charts illustrating the execution of these processes using FCFS, SJF(non-preemptive), a preemptive priority (small priority number means high priority), and a RR (quantum=1) scheduling.

      (ii) Calculate average waiting time and average turnaround time for all above mentioned scheduling algorithms.

  (b) Describe multilevel feedback queue scheduling. (4)

3. (a) Define process. Explain different process states. (6)

  (b) Explain "Layered Approach" to Operating System design. (4)

4. (a) Differentiate between static and dynamic linking. (6)

  (b) What are the reasons for a parent process to terminate execution of its child processes? (4)

5. (a) Describe challenges in programming for multicore systems. (6)

  (b) Assuming the 1-KB page size, what are the page numbers and offsets for the following address references under paging scheme of memory allocation?

<div align="right">P.T.O.</div>

(i) 2375

(ii) 4075

(iii) 33

(iv) 14866 (4

6. (a) Given memory partitions of 200KB, 600KB, 100KB, 300KB and 500KB (in order). How would each of the first fit, best fit and worst fit algorithm place processes of 350 KB, 150KB, 250KB and 450KB (in order)? Which algorithm makes the most efficient use of memory? (6)

(b) What is external fragmentation? How can it be solved? (4)

7. (a) Explain three modes of **vi** editor and explain how can you switch from one mode to another. (6)

(b) Write a shell program to compute **1/n!** for a given n. (4)

8. Write short notes on **any two** : (2×5)

(a) Segmentation scheme of memory Allocation

(b) Unix System Architecture

(c) Demand paging and page fault

(1700)