2022
COMPUTER SCIENCE
[HONOURS]
(CBCS)
(B.Sc. Third Semester End Examination-2022)
PAPER-CC6T
[Operating System]

Full Marks: 40   *Time: 02 Hrs*

The figures in the right hand margin indicate marks
Candidates are required to give their answers in their own words as far as practicable
Illustrate the answers wherever necessary

Group-A

1. Answer any five questions of the following: **5x2=10**

i) Explain multiprogramming in operating system.

ii) What is Aging?

iii) What is semaphore? What is binary semaphone?

iv) What is Internal and External fragmentation?

v) Explain multitasking in OS.

vi) What is Starvation? How to solve it?

vii) What is Preemptive scheduling?

viii) What is Belady'sw Anomaly?

Group-B

Answer any four questions of the following: **4x5 = 20**

2. What do you understand by process? Explain various state of a process with suitable diagrams

3. What is preemtive scheduling? Compare with non-preemtive scheduling discipline. What is starvation in operating system.

4. Explain context Switching? What is scheduling? What criteria affect the scheduler's performance?

5. Given memory partitions of 300K.B, 500K.B, 200K.B, 250K.B, & 400K.B (in that order), How would the First-fit, Best-fit & Worst fit algorithms place the process A:310K.B, B:410K.B, C:112K.B & D:426K.B (in that order).

   Which algorithm makes the most optimal use of the memory.

6. Consider the following snap-shot of Jobs to be executed using R-R algorithm with a time slice = 4ms. Context switching Time=1ms. Find the average Waiting time and Turnaround Time.

Process	Arrival Time (ms)	Next Burst Time (ms)
P_0	0	7
P_1	1	6
P_2	3	2
P_3	5	5

7. Explain short-Term, Long-Term and Medium-Term scheduler. Compare Long-Term scheduler With short-Term scheduler.

Group –C

Answer any one question: **1x10 = 10**

8. a) What is deadlock? What are the four necessary & sufficient conditions behind the deadlock?

   b) Consider the following snapshot of a system:

Process	Allocation			Max		
	A	B	C	A	B	C
P_0	0	1	0	7	5	3
P_1	2	0	0	3	2	2
P_2	3	0	2	9	0	2
P_3	2	1	1	2	2	2
P_4	0	0	2	4	3	3

Let the available number of resources be given by availvector as (3,3,2). Use Banker's algorithm & answer the following

i)   Find the content of the matrix 'Need'

ii)   Is the system in a safe state?

iii)   If a request from process P4 for (3,3,0) arrives, can it be granted immediately?

9. a) What is paging? What is the concept of demand paging?

   b) Consider the following page reference string :

1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6

How many page faults will occur for the following page replacement algorithms?

Set of three page frame (Initially all empty)

i)   FIFO

ii)   LR

iii)   Optimal   4+6