

331

B.Sc. (Part - II) Examination, 2022

COMPUTER SCIENCE

First Paper

(Operating System)

Time : Two Hours]

[Maximum Marks : 50

Note : Attempt any **four** questions. **All** questions carry equal marks.

1. What is an operating system? Explain its various function. What are the different types of an operating system? Differentiate Multiprogramming systems with time Sharing operating systems.
2. What do you mean by a process? Explain the life cycle of process with proper states. What is process control block (PCB)?
3. Memory partitions of 100kb, 500kb, 200kb, 300kb, 600kb are available How would best, worst & first fit algorithms to place process of 212kb, 417kb, 112kb, 426kb? Differentiate between contiguous and non contiguous allocation methods?
4. Define the following terms :
 - (a) Swapping
 - (b) Demand Paging
 - (c) Thrashing
 - (d) Virtual Memory
 - (e) Segmentation
5. Using LRU (Least Recently Used) and FIFO (First In First Out) page replacement algorithms find out the total number of page faults for the given string :
0, 2, 1, 6, 4, 0, 1, 0, 3, 1, 2, 1, 3, 0, if the no. of frames are 4.

P.T.O.

6. What do you understand by a file system? Explain various file Allocation methods with suitable diagrams. Differentiate Sequential Access Method with Random Access method.

7. Consider the following table of arrival time and burst time for three process P_0 , P_1 , & P_2 :-

Process	Arrival Time	Burst Time
P_0	0 μ s	9 μ s
P_1	1 μ s	4 μ s
P_2	2 μ s	9 μ s

Using round robin scheduling Algorithm if time quantum is 3 μ s. What would be the average waiting time for the three process? Compute turn Around time for each process & through put of the system.

8. What do you understand by deadlock? What are the four necessary conditions for a deadlock to occur? Explain each one of it.

9. What do you mean by Deadlock prevention? How deadlock prevention is different from deadlock avoidance? Explain the Banker's algorithm to prevent a deadlock. <https://www.dbraonline.com>

10. A single process system has three resource types x, y and z which are shared by three process. There are 5 units of each resource type. At time t_0 , the system is in the following state, check whether it is safe state or not?

	Allocated			Request (Maximum)		
	X	Y	Z	X	Y	Z
P_0	1	2	1	2	2	4
P_1	2	0	1	2	1	3
P_3	2	2	1	3	4	1

At time t_1 , process P_2 request for 1 1 0 for x, y & z resource type respectively, check whether this request can be fulfilled or not, using Banker's Algorithm.