2022

Computer Science

[P.G.]

(CBCS)

(M.Sc. Third Semester End Examination-2022)

PAPER-301

[Advanced Operating System]

Full Marks: 50   **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**

a) What are the functionalities of Fork and Exec system calls?

b) What is Overlay?

c) Distinguish between User mode and Kernel mode of operations.

d) What is Dispatcher?

e) Differentiate between Protection and Security.

f) Differentiate betweenInternal and External Fragmentation.

g) What is meant by Independent process?

h) What is meant by Interrupt?

Group-B

Answer any FOUR questions of the following: 4x5 = 20

2. Justify the following sentence: "Cycle in resource allocation graph doesnot always imply the occurrence of Deadlock".

3. Consider the following page reference string:

   7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1

   How many page faults wopuld occur for the FiFo and Optimal page replacement algorithms, assuming 3 frames are available and initiaslly none of pages in main memory?

4. What is TLB? Consider a single level paging schema with a TLB. Assume no page fault occur. It takes 100 ns to access the physical memory. If TLB hit ratio is 60% and effective memory access time is 160 ns, then calculate TLB access time.

5. Given the memory partition of 100K, 500K, 200K and 600K in order. How would Best fit and Worst fit algorithm place processes of 212K, 417K, 112K, and 426K in order.

6. What is a critical section problem? Describe the condition required for the solution to a critical section problem.

7. Explain how monitors are used in inter process communication.

Group -C

Answer any ONE question of the following: 1x10 = 10

8. What is Race Condition in context of Process Synchronization? Explain the solution of bounded buffer Producer-Consumer problem with semaphore.   4+6

9. Distinguish between Starvation and Deadlock. Consider the following snapshot of a system. Is the system is in safe state? Justify.   2+8

Process=(P0,P1,P2,P3,P4)   Available Resources (A,B,C,D) = (1,5,2,0)

Allocation

	A	B	C	D
P0	0	0	1	2
P1	1	0	0	0
P2	1	3	5	4
P3	0	6	3	2
P4	0	0	1	4

Max

	A	B	C	D
P0	0	0	1	2
P1	1	7	5	0
P2	2	3	5	6
P3	0	6	5	2
P4	0	6	5	6

Internal Assessment :10