RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. THIRD SEMESTER EXAMINATION, MARCH 2021

SECOND YEAR [BATCH 2019-22]

Date : 16/03/2021 **COMPUTER SCIENCE [HONOURS]**

Time : 11.00 am – 1.00 pm **Paper : VI [CC 6]** Full Marks : 50

Answer **any five** of the following questions: [5×10]

1. a) Consider the following set of processes, with the arrival times and the CPU-burst times given in milliseconds:

Process	Burst Time
P1	5
P2	6
P3	7
P4	9
P5	2
P6	3

Calculate average waiting time and average turnaround time for round robin scheduling with time slice of 3 milliseconds.

b) Compare process and program in context of operating system.

c) What do you mean by co-operating process? [5+3+2]

2. a) Explain with example about the different phases in analysis part of the compiler.

b) What do you mean by normal and abnormal termination of a process?

c) What is pre-processor? Give the examples of two different types of pre processor directives. [4+3+3]

3. a) What are the tasks of Linker and Loader ? Clearly distinguish their work.

b) What are the two models of interprocess communication? What are the strengths and weaknesses of the two approaches?

c) What are the main differences between operating systems for standalone computer and connected computer?

d) What do you mean by virtual machine? [2+4+2+2]

4. a) Given memory partitions of 100K, 500K, 200K, 300K and 600K, how would best fit algorithm processes of 212K, 417K, 112K and 426K in order?

b) What would be the behavior of a system if we stop the service of swapping in a running operating system? Explain your answer?

c) Explain thrashing in memory management? [4+3+3]

5. a) Consider a system with byte-addressable memory, 16 bit logical addresses, 4 KB page size and page table entries of 4 bytes each. What is size of the page table in the system in megabytes?

b) Explain internal fragmentation with a proper example.

c) What do you mean by assembly code? Explain with example. [3+4+3]

6. a) Explain how Peterson's solution is helpful to avoid critical section problem.

   b) An operating system uses the Banker's algorithm for deadlock avoidance when managing the allocation of three resource types X, Y, and Z to three processes P0, P1, and P2. The table given below presents the current system state.

	Allocation	Max
	X Y Z	X Y Z
P0	1 0 1	8 4 3
P1	2 2 0	6 2 0
P2	2 1 1	3 3 3

   There are 3 units of type X, 2 units of type Y and 2 units of type Z still available. Check whether the system is in safe state or not.

   c) Define Semaphore. [4+4+2]

7. a) Define RAID 0 and RAID 10 with a diagram.

   b) Cylinder a disk queue with requests for I/O to block on cylinders 42, 38,121, 188, 85, 12, 92, 10. The C-LOOK scheduling algorithm is used. The head is initially at cylinder number 65, moving towards larger cylinder number on its servicing pass. The cylinders are numbered from 0 to 199. Calculate the total head movement incurred.

   c) What do you mean by file mounting? [4+3+3]

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