

END SEMESTER EXAMINATIONS, JUNE 2019

BCA THIRD SEMESTER

COURSE CODE: BCA204

COURSE TITLE: OPERATING SYSTEMS

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

Section (A)Q.1. Attempt **all** questions.

(2 x 10 = 20)

- a. What are semaphores?
- b. Explain the need of PCB (process control block).
- c. What is compaction?
- d. What is thrashing?
- e. What is system call?
- f. Write the goal of operating system.
- g. Explain cpu bound and input output bound process?
- h. What is dispatcher?
- i. Why we do page replacement? Explain.
- j. Define belady's anomaly problem in FIFO.

Section (B)Q.2. Attempt **any five** questions.

(7 x 5 = 35)

- a. Consider the following page reference string:
4,2,1,5,6,2,1,3,7,6,3,2,1,2,3,6,1,2,3
How many page faults would occur for the algorithm optimal page replacement using four frames?
- b. Consider a system with 5 processes. Each requires 2 units of resources to complete the execution, then what is the minimum no of resources required to avail deadlock free environment?
- c. What is Operating system? Explain various types of operating systems.
- d. Explain various necessary conditions for the deadlock.
- e. What is the difference between kernel level thread and user level thread?
- f. What is process? Explain with the help of process transition diagram
- g. Under what circumstances page faults occur? Describe the actions taken by the operating system when a page fault occurs.

Section(C)Attempt **any three** questions.

(15 x 3 = 45)

- Q.3.
 - a. How can we prevent deadlock using deadlock prevention techniques? Explain.
 - b. Consider a system with logical address space is 128M words and physical address is of 24 bits. The physical address is divided into 8K frames. What is the page size and how many pages in logical address space?
- Q.4.
 - a. Define fixed partition and variable partition memory allocation scheme.
 - b. Using shortest Job First scheduling technique calculates the average Turn Around Time for the following processes.

PROCESS	ARRIVAL TIME	BURST TIME
1	5	3
2	7	1
3	6	2
4	1	1
5	1	2
6	8	3

Q.5. a. What is paging? Explain the working of page table with the help of diagram

b. Consider the following snapshot of a system:

	ALLOCATION	MAX	AVAILABLE
	A B C D	A B C D	A B C D
PO	0 0 1 2	0 0 1 2	1 4 2 0
P1	1 0 0 0	1 7 5 0	
P2	1 3 5 4	2 3 5 6	
P3	0 6 3 2	0 6 5 2	
P4	0 0 1 4	0 6 5 6	

Answer the following questions using the banker's algorithm:

a. What is the content of the matrix Need?

b. Provide the safe sequence of the above.

Q.6. a. Using Longest Job First scheduling technique calculates the average Turnaround Time for the following processes.

PROCESS	ARRIVAL TIME	BURST TIME
1	9	5
2	7	1
3	6	7
4	1	1
5	1	5
6	8	3

b. Define the process flowchart of Round Robin scheduling algorithm.

Q7. a. A disk with 800 cylinders, numbers 0 to 799, compute the number of tracks the disk arm must move to satisfy all the request in the disk queue. Assume the last request serviced was at track 345 and the head is moving towards track 0. The queue in FIFO order contains request for the following tracks:

123,574,692,475,105,376

Perform the computation for the following scheduling algorithms:

i) FIFO

ii) SSTF

b. What is the difference between multitasking and multiprogramming operating system? Explain.
