(Please write your Exam Roll No.) *Exam Roll No. .....*

END TERM EXAMINATION

FIFTH SEMESTER [BCA] DECEMBER - 2019

Paper Code: BCA301 ***Subject: Operating System***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt any five questions including Q.no.1 which is compulsory. Select one question from each unit.

Q1 Answer the following (**Any Five**):- **(5x5=25)**

a) Explain the role of Operating System. Give example of each type of Operating System.
b) What is Thrashing? Mention possible solutions for this problem.
c) Explain Process State Transition with the help of diagram.
d) Explain the use of Access Matrix in System protection.
e) Explain Disk Reliability.
f) Explain processor affinity in context to multiple processor system.

UNIT I

Q2 (a) Explain Continuous and Non-Continuous Memory Allocation with diagram. **(6)**

(b) Consider the following page reference string: **7,2,3,1,2,5,3,4,6,7,1,0** Assuming demand paging with four frames, how many page faults would occur for the following replacement algorithms? **(6.5)**

i) LRU replacement
ii) FIFO replacement
iii) Optimal replacement

Q3 (a) Explain various types of fragmentation and memory allocation strategies. **(6)**

(b) Explain segmentation in memory management. With a neat diagram explain hardware required to implement segmentation. **(6.5)**

UNIT II

Q4 (a) Explain how reader-writer problem can be solved using semaphore with the help of pseudocode. **(6)**

(b) Consider the following five process, with the length of the CPU burst time given in milliseconds. **(6.5)**

Process	Arrival Time	Burst Time
P1	0	8
P2	1	4
P3	2	9
P4	4	5
P5	4	3

(i) Draw five Gantt charts that illustrate the execution of these process using the following scheduling algorithms: FCFS, SJF, Pre-emptive SJF (SRTN), RR (quantum=2).

(ii) What is average turnaround time and average waiting time for each of the scheduling algorithm in part (i).

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Q5 (a) Explain three different types of scheduler in operating system with the help of neat diagram. Explain specific role of each type of scheduler. **(10)**

(b) Explain how producer consumer problem can be solved using semaphore with help of pseudocode. **(2.5)**

UNIT III

Q6 (a) Explain deadlock and four necessary condition for its occurrence. Explain how deadlock can be prevented. **(6)**

(b) Consider the following snapshot of a system at time T_0. **(6.5)**

	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	7	5	3	3	3	2
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			

Answer the following questions using the banker's algorithm:

(i) What is the content of the matrix ***Need***?

(ii) Is the system in a safe state? If yes, mention the safe sequence?

(iii) If the request from process P1 arrives for (1,1,2) can the request be granted immediately?

Q7 (a) Explain swap-space management task of the operating system and explain the concept of raw partition. **(6)**

(b) Suppose that a disk drive has 300 cylinders, numbered 0 to 299. The drive is currently serving a request at cylinder 150. The queue of pending requests, in FIFO order, is:

69,12, 196, 202, 144, 218, 256, 123, 165, 81.

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithm? **(6.5)**

(i) FCFS

(ii) SSTF

(iii) SCAN

(iv) LOOK

UNIT IV

Q8 (a) Explain layered design of the file system with diagram. **(6)**

(b) Explain various types of Program threats and System threats. **(6.5)**

Q9 (a) Explain three methods of allocating disk space: contiguous, linked, and indexed. **(6)**

(b) Explain different file access methods with diagram. **(6.5)**

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