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

END TERM EXAMINATION

FIFTH SEMESTER [BCA] NOVEMBER-DECEMBER 2017

Paper Code: BCA-301 ***Subject: Operating System***

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

Note: Attempt all questions as directed. Internal choice is indicated.

Q1 Attempt **any five**: **(5x5=25)**

(a) What is Belady's Anomaly?
(b) List the necessary conditions for a deadlock to occur.
(c) Discuss the structure of Process Control Block (PCB) and explain the utility of each variable.
(d) Briefly explain how starvation is avoided in the operating system.
(e) Explain the concept of Thrashing. When it occurs?
(f) Why do some systems keep track of the type of a file, while others leave it to the user and others simply do not implement multiples file type? Which system is "better"?

Unit-I

Q2 (a) Consider the following set of processes with length of CPU burst times (given in milliseconds) and arrival time as specified:

Process	Arrival Time	Burst Time
P1	0	7
P2	1	4
P3	2	8
P4	3	5

Draw Gantt chart illustrating the execution of these processes using preemptive SJF scheduling algorithm. Also calculate the average waiting time. **(5)**

(b) What is dining philosopher problem? Explain monitor solution to dining philosopher problem. **(7.5)**

OR

Q3 (a) What is semaphore? Describe how semaphore can be used for block wake up synchronization between processes. **(5)**

(b) Consider the following snapshot of the system: **(7.5)**

Allocation				
P-id	**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				
P-id	**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

Available			
A	**B**	**C**	**D**
1	5	2	0

Answer the following question using the ***Banker's Algorithm***:

(i) Derive the ***Need*** Matrix.
(ii) Is the system in a safe state?

P.T.O.

(iii)A request from process P1 arrives for (0, 4, 2, 0), can this request be granted immediately or not?

Unit-II

Q4 (a) What is Critical-Section problem? What are the requirements that critical-section problem must satisfy for its solution? **(5)**

(b) Describe the need for Device management. Explain techniques used for managing and allocating devices. **(7.5)**

OR

Q5 (a) What is an operating system? Discuss the main services of operating system and also discuss the purpose of system calls in operating system. **(5)**

(b) What is the goal of multiprogramming? Differentiate between a time sharing system and real time system. **(7.5)**

Unit-III

Q6 (a) Differentiate between Paging and Segmentation. Discuss the concept of Paging in detail with the help of the suitable diagram. **(5)**

(b) Given the memory partitions of 100K, 500K, 200K, 300K & 600K (in order). Explain the working of Best fit, First fit & Worst fit algorithms for the processes of size 220 K, 410K, 115K & 430K. Which is the most efficient algorithm? **(7.5)**

OR

Q7 (a) What are multiprocessor systems? List their advantages and explain different types of multiprocessor systems. **(5)**

(b) Discuss various types of disk Scheduling techniques. **(7.5)**

Unit-IV

Q8 (a) Discuss Resource Allocation Graph Algorithm in detail. **(3.5)**

(b) Write short notes on the following **(Any Three):** **(3x3=9)**

(i) Virtual Memory
(ii) Threats to System Security
(iii)Role of Operating System
(iv) Swapping

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