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

END TERM EXAMINATION

FIFTH SEMESTER [BCA] NOVEMBER-DECEMBER 2018

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

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

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

Q1 Answer the following:- **(2.5x10=25)**

(a) Write a short note on Batch System.
(b) Explain semaphores. What happens when the value of semophose is negative?
(c) What is Thrashing? What are possible solutions for this problem?
(d) Mention various CPU scheduling criterias.
(e) What is boot block?
(f) Write a short note on buffering.
(g) Discuss some operations that could be performed on a directory.
(h) Explain Denial of service.
(i) Discuss Swap space management.
(j) What are the necessary conditions for a deadlock to occur?

UNIT-I

Q2 (a) What is fragmentation? What are the various measures to avoid fragmentation? **(4)**
(b) Explain the concept of paging and demand paging. **(6)**
(c) Discuss in detail the process of segmentation. **(2.5)**

Q3 (a) Explain in detail the concept of swapping. **(3.5)**
(b) Consider the reference string: 1,2,3,2,1,5,2,1,6,2,5,6,3,1,3,6,1,2,4,3. If 3 frames are there in memory then how many page faults will be there using following page replacement algorithms: **(9)**
(i) FIFO
(ii) Optimal
(iii) LRU

UNIT-II

Q4 (a) What is critical section? Discuss the requirements that must be satisfied as a solution to critical section problem. **(4)**
(b) Explain Readers-Writers problem in detail. **(4)**
(c) Define process. Explain various states that process undergoes with the help of process state diagram. **(4.5)**

Q5 (a) What are the various operations that could be carried out on a process? **(3)**
(b) Consider the following set of processes, with the length of CPU-burst time given in nanoseconds: **(9.5)**

Process	Arrival Time	Burst Time	Priority
P1	0	21	2
P2	1	3	1
P3	2	6	4
P4	3	2	3

P.T.O.

Time Quantum = 2ns.
Prepare a GANTT chart and calculate the average time using FIFO, Round Robin, Priority Scheduling algorithms.

UNIT-III

Q6 Suppose a disk has 201 cylinders, numbered from 0 to 200. The drive is currently serving a request at cylinder 100, and there is queue of disk access requests for cylinders 30, 85, 90, 100, 105, 110, 135, 145. Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all FIFO, SSTF, SCAN, LOOK, C-SACN, C-LOOK algorithms. **(12.5)**

Q7 (a) What are the various ways to recover from deadlock? Explain. **(4.5)**
(b) Write a short note on following:- **(8)**
(i) Dedicated Devices
(ii) Virtual Devices
(iii) Shared Devices
(iv) Storage Devices

UNIT-IV

Q8 (a) Explain various access methods available for accessing a file. **(4.5)**
(b) Write a short note on user authentication. **(8)**

Q9 (a) Explain some basic operations that could be carried on a file. Also specify what information are associated with an open file. **(4)**
(b) Write a short note on various program threats and system threats. **(8.5)**

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P2/2