21/02/23

1481/III

B.C.A. (PART-II) EXAMINATION, 2022-23

(Third Semester)

9068

(BCA 301 : OPERATING SYSTEM)

Paper : I

Time : Three Hours] [Maximum Marks : 70

Note: (i) Answer **Five** Questions in all.

(ii) Question No. **1** is **Compulsory**.

(iii) Answer remaining **Four** questions, selecting **two** from each Section **A** and **B** each.

(iv) All questions carry equal marks.

1. Answer all parts of the following:

(a) Mention the objectives and functions of an operating system.

(b) What are the criteria for evaluating the CPU scheduling algorithms?

(c) Explain components of process control block.

(d) Differentiate between multiprogramming and multiprocessing.

Section-A

2. With a neat sketch, describe the services that an operating system provides to users, processes and other systems.

3. What is the critical section? What are the minimum requirements that should be satisfied by a solution to critical section problem?

4. Assume the following workload in a system:

Process	Arrival Time	Burst Time
P1	5	5
P2	4	6
P3	3	7
P4	1	9
P5	2	2
P6	6	3

Draw a Gantt chart illustrating the execution of these jobs using round robin scheduling algorithm and also calculate the average waiting time and average turnaround time.

5. Define virtual Memory. Explain the process of converting virtual addresses to physical addresses with a neat diagram.

Section-B

6. (a) What is a page fault? Explain the steps involved in handling a page fault with a neat sketch.

   (b) Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many page faults would occur for the least recently used algorithm, assuming three frames and all frames are initially empty?

7. (a) What are the disadvantages of single contiguous memory allocation? Explain.

   (b) Given memory partition of 100 KB, 500 KB, 200 KB and 600 KB (In order). Show with neat sketch.

   How would each of the first-fit, best-fit and worst fit algorithms place processes of 412 KB, 317 KB, 12 KB and 326 KB (In order).

8. (a) How does deadlock avoidance differ from deadlock prevention? Write about deadlock avoidance algorithm in detail.

(b) Explain the difference between external fragmentation and internal fragmentation. How do solve the fragmentation problem using paging?

9. Write note on any two of the following:

(a) Segmentation

(b) File accessing method

(c) File allocation method

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