

# **BACHELOR OF COMPUTER APPLICATIONS (BCA\_NEW)**

BCA\_NEW ASSIGNMENT SEMESTER-2

## **ASSIGNMENTS**

**(January, 2025 & July, 2025 sessions)**

**FEG-02, MCS-202, MCS-203, MCSL-204, MCS-201, MCSL-205**



**SCHOOL OF COMPUTER AND INFORMATION  
SCIENCES , INDIRA GANDHI NATIONAL OPEN  
UNIVERSITY ,MAIDAN GARHI, NEW DELHI – 110 068**

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### **Important Notes**

1. Submit your assignments to the Coordinator of your Study Centre on or before the due date.
2. Assignment submission before due dates is compulsory to become eligible for appearing in corresponding Term End Examinations.
3. To become eligible for appearing in the Term End Practical Examination for the lab courses, it is essential to fulfill the minimum attendance requirements as well as submission of assignments (on or before the due date)

**Course Code** : **MCS-203**  
**Course Title** : **Operating Systems**  
**Assignment Number** : **BCA\_NEW(II)/203/Assignment/2025**  
**Maximum Marks** : **100**  
**Weightage** : **30%**  
**Last Date of Submission** : **30<sup>th</sup>April,2025(For January Session)**  
**31<sup>st</sup> October, 2025 (For July session)**

**This assignment has eight questions. Answer all questions. Each question is of 20 marks. The remaining 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide.**

**Question 1:**

Consider the following jobs:

Job #	Arrival time	Run time
A	0	4
B	2	5
C	3	6
D	5	5

- Using the **SRTF** method, compute the completion times of the above jobs, average turnaround time, and average waiting time.
- Using the **SJF** (Shortest Job First) method, compute the completion times of the above jobs, the average turnaround time, and the average waiting time.
- Using the Round Robin method (with Quantum = 2), compute the completion times of the above jobs and the average waiting time. **(12 Marks)**

**Question 2:**

Discuss the different techniques for I/O management in an operating system. Explain how buffering, spooling, and caching improve I/O performance. Give examples to illustrate their practical applications. **(8Marks)**

**Question 3:**

Describe the structure of a disk in an operating system and explain the concept of disk scheduling. Compare the FCFS, SSTF, and SCAN scheduling algorithms. Provide an example to demonstrate the working of these algorithms. **(10 Marks)**

**Question 4:**

Compare and contrast contiguous and non-contiguous memory allocation methods. Explain the First-Fit, Best-Fit, and Worst-Fit algorithms for memory allocation with examples. Which method is more efficient and why? **(10 Marks)**

**Question 5:****(10 Marks)**

Consider the following page-reference string:

1, 3, 4, 2, 7, 8, 6, 2, 3, 9, 6, 4, 2, 1, 3, 5, 9, 10, 4, 1, 5, 3, 4

How many page faults would occur for following replacement algorithms assuming four frames? Remember that all frames are initially empty, so your first unique pages will all cost one fault each.

- i. FIFO replacement.
- ii. LRU replacement.
- iii. Optimal replacement.

**Question 6:**

Differentiate between processes and threads. Explain the advantages of multithreading in an operating system. Propose a threading algorithm using a producer-consumer problem and explain how synchronization is achieved using semaphores.

**(10 Marks)****Question 7:**

Explain the concept of virtual memory and its importance in modern operating systems. Describe the working of demand paging and how page faults are handled. Provide an example to demonstrate the process.

**(10 Marks)****Question 8:**

Describe the architecture of a mobile operating system such as Android or iOS. Discuss the key features, differences from desktop operating systems, and challenges associated with mobile OS development.

**(10 Marks)**