



**INDIRA GANDHI NATIONAL TRIBAL UNIVERSITY
AMARKANTAK (M.P.)**

End Semester Examination- May 2019

**B.C.A. - IV Semester
Paper- Operating System
Paper Code-BCA-401**

Time:- Three Hours

Maximum Marks: 60

Note: Attempt questions of all **three** sections as directed. Distribution of marks is given with sections.

**Section 'A'
(Objective Type Questions)**

Note: All questions are compulsory and each question carries equal marks.
10 × 1 = 10

1. Choose the correct answer.

1. Which of the following statements are true?

- a. Shortest remaining time first scheduling may cause starvation
- b. Starvation may be caused by preemptive scheduling.
- c. In terms of response time robin round is better than FCFS
- d. All of the above statements are true

2. Where can the Belady's anomaly occur?

- a. LRU Page Replacement Policy
- b. MRU Page Replacement Policy
- c. Optimal Page Replacement Policy
- d. FIFO Page Replacement Policy

3. Which page is selected by the Optimal Page Replacement Algorithm?

- a. The page that has been used for maximum.
- b. The page that has been used minimum.
- c. The page that has not been used for the longest time in the past.
- d. The page that will not be used for the longest time in the future.

4. Which of the following is / are the essential contents in each entry of a page table?
- a. Page frame number
 - b. Virtual page number
 - c. Access right information
 - d. Both page frame number and virtual page number
5. What is the most suitable scheduling policy for a time - shared operating systems?
- a. Shortest Job First
 - b. Elevator
 - c. First Come First Served
 - d. Round Robin

When size of the memory is increased the page replacement policy that sometime leads to more page faults is called _____.

- a. FIFO
 - b. Optimal
 - c. LRU
 - d. None of the above
6. What works on the principle of locality?
- a. Cache memory
 - b. Interrupts
 - c. Polling
 - d. DMA
7. The address generated by the CPU is referred to as:
- a. physical address
 - b. logical address
 - c. physical as well as logical address.
 - d. None of the above
8. Which of the following is deadlock avoidance algorithm?

- a. round-robin algorithm
 - b. banker's algorithm
 - c. Multilevel feedback
 - d. None of the above.
9. Which technique is used to temporarily removing non-active programs from the memory of computer system?
- a. Swapping
 - b. Spooling
 - c. Scheduler
 - d. None of the above.

Section 'B'
(Short Answer Type Questions)

Note: Attempt all five questions. Each question carries equal marks. 3x5=15

2. What is an operating system? What are the various objectives and functions of Operating systems?

OR

Discuss the Simple Operating System Structure. Describe the layered approach too.

3. What is system calls in OS? Explain in detail with its types

OR

Explain about different multithreading models with suitable diagram?

4. Explain about advantages and disadvantages of paging and differentiate between paging and segmentation too?

OR

What is Segmentation? What is the basic method of Segmentation?

5. Differentiate between Dedicated Devices, Shared Devices & Virtual Devices?

OR

Explain LOOK disk scheduling algorithm with proper diagram.

6. What is Dictionary? What operation can be performed on a Dictionary?

OR

Describe indexed file, indexed sequential file organization with suitable diagram.

Section 'C

(Long Answer Type Questions)

Note: Attempt all five questions in detail. Each question carries equal marks.

7X5=35

7. What are the types of Real time systems? What are the applications of real-time systems? Explain them?

OR

Explain simple batch system and time sharing operating system with example?

8. Consider the following five processes, with arrival time and length of the CPU burst time given in milliseconds.

Process	Arrival time	Burst time
P1	0	08
P2	1	21
P3	2	13
P4	3	07
P5	4	10

Consider the Non Preemptive Shortest Job First (SJF) and Round Robin (RR) (quantum=07ms) scheduling algorithms. Illustrate the scheduling using Gantt chart. Which algorithm will give the minimum average waiting time? Discuss.

OR

A computer system has 5 processes (P₀, P₁, P₂, P₃, P₄) and 3 resource types with instant: A= 8, B = 5, C = 6. Assume that at time t₀ the following snapshot of the system has been taken:

Process	Allocation			Max Need			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	2	2
P1	2	0	1	3	2	1			
P2	2	0	2	6	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	3	3	3			

Use the Bankers algorithm to determine: is the current system safe? If so, give a safe sequence. Show your working step by step.

9. Consider the following page reference string: 2, 3, 4, 2, 1, 5, 6, 4, 1, 2, 3, 7, 6, 3, 2, 1. Calculate the number of page faults would occur for the Least Recently Used (LRU) page replacement algorithm with frame size of 3.

OR

Assume a CPU have 15 bit Address scheme and it support page size up to 256B. If a user program has 16340 as logical address then find corresponding page number and offset for physical memory.

10. Explain and compare the SCAN and C-SCAN disk scheduling algorithms with suitable examples.

OR

Suppose the disk drive has 200 cylinders numbered 0 to 199 and consider a disk queue with requests for I/O to blocks on cylinders 80, 159, 27, 100, 12, 115, 55, 90 in that order. Assume the disk head is initially at cylinder 50. Show diagrammatically as well as explain SCAN disk scheduling and find out the total head movement by using SCAN algorithm.

11. Explain different type of File Access Methods with suitable diagrams.

OR

What do you understand by free space management? Explain the different techniques to manage free space
