

DCCA301

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III Semester B.C.A. Degree Examination, April - 2023

COMPUTER APPLICATION

Operating Systems

Paper : CA - CIIT

(NEP Scheme)

Time : 2½ Hours

Maximum Marks : 60

Instructions to Candidates:

Answer all the questions.

PART - A

I. Answer any **four** questions. Each carries 2 marks.

(4×2=8)

1. Define
 - a. Process.
 - b. Thread.
2. What do you mean by critical section?
3. What is safe state?
4. What is page fault?
5. What are the various file operations?
6. Define Rotational latency.

PART - B

II. Answer any **four** questions. Each question carries 5 marks.

(4×5=20)

7. Explain the states of a process with a block diagram.
8. What is a system call? Explain its types.
9. Explain producer - consumer problem using semaphores.

[P.T.O.]



10. Consider the following set of process with CPU burst time and arrival time.

PID	Arrival time	Burst time (in ms)
P ₁	0	5
P ₂	1	7
P ₃	2	4
P ₄	3	2

Draw the Gantt chart illustrating the execution of the process using Round robin algorithm with a time slice of 2 ms. Find average waiting time and turn around time.

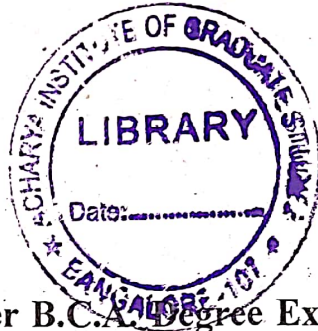
11. What is fragmentation? Discuss the different types of fragmentation.
12. Briefly explain the different types of network - based operating system.

PART - C

III. Answer any **four** questions. Each carries **8** marks.

(4×8=32)

13. Define operating system. Explain the operating system structure with a block diagram.
14. Explain necessary conditions of deadlock. Discuss the methods of handling deadlock recovery.
15. Explain interprocess communication in detail.
16. Consider the following page reference string.
1,3,0,5,6,3 with 3 page frames. Find the number of page faults using FIFO page replacement algorithm.
17. Explain disk scheduling algorithms SCAN and look with suitable graphs.
18. Write short notes on :
 - a. Resource - Allocation graph. (4)
 - b. Segmentation. (4)



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III Semester B.C.A. Degree Examination, March/April - 2023

COMPUTER APPLICATIONS

Operating System

(CBCS Scheme)

Paper : BCA 305 T

Time : 3 Hours

Maximum Marks : 100

Instructions to Candidates:

Answer all the sections.

SECTION - A

I. Answer any Ten of the following. Each question carries 2 marks. (10×2=20)

1. Define operating system. Give two examples.
2. Define process.
3. What is a thread?
4. Define aging.
5. What is pre - emptive scheduling?
6. What is thrashing?
7. Mention any two functions of operating system.
8. Explain multi - programming system.
9. What is a system call?
10. Define Deadlock.
11. Mention the responsibilities of memory management?
12. Explain the terms swap in and swap out.

SECTION - B

II. Answer any Five of the following. Each question carries 5 marks. (5×5=25)

13. Explain services provided by the operating systems.
14. Explain process state with a neat diagram.
15. Discuss the functions of file management.
16. Explain the difference between local and global allocations.
17. Explain steps involved in page replacement.
18. Explain the methods of handling deadlock.

[P.T.O.]





19. What is paging? Explain page fault.
20. Write a short note on virtual machine.

SECTION - C

III. Answer any **Three** of the following. Each question carries **15** marks. (3×15=45)

21. Explain types of operating system. Mention its advantages and services.
22. Explain the inter process communication in detail.
23. What is process synchronization? Explain producer consumer problem using semaphores.
24. a) Explain Banker's algorithm. (10)
b) Briefly explain deadlock recovery. (5)
25. Explain the disk scheduling algorithms SCAN, Look and C_{look} with suitable graphs.

SECTION - D

IV. Answer any **One** of the following. Each question carries **10** marks. (1×10=10)

26. Consider the following set of processes with the length of the CPU burst time given in MS.

Process	Burst time	Priority
P ₁	5	2
P ₂	1	4
P ₃	2	3
P ₄	6	1
P ₅	8	3

The process are assumed to have arrived in the order P₁, P₂, P₃, P₄ and P₅ all at time 0 (zero).

- i. Draw four Gantt chart illustrating the execution of these processes using FCFS, SJF, and non - pre - emptive priority.
 - ii. What is the turnaround time and waiting time of each process in the entire scheduling algorithm mentioned above.
27. Consider the reference string.
7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7.
Find the page fault rate using FIFO page replacement algorithm.