

24NN802**MCA II Semester (New Scheme) Main/ Back Exam-2023-24****MCA 222 – Operating System****Time : 3 Hours****Maximum Marks: 80****Min. Passing Marks: 26****Instructions to Candidates:**

- Student has to attempt all 10 very short answer type questions (2 marks each).
- Student has to attempt all 5 short answer types questions (4 marks each).
- Student has to attempt all 5 questions (8 marks each).

Use of following supporting materials is permitted during examination. (Mentioned in form No. 205)

1 _____

2 _____

PART A**(Attempt all 10 very short answer type questions, 2 marks each)**

- Q.1 What is an operating system?
- Q.2. What is the difference between a process and a thread?
- Q.3. What are turnaround time and response time?
- Q.4. What is long term scheduling?
- Q.5. Define non-preemptive scheduling.
- Q.6. What is virtual memory?
- Q.7. What is busy waiting?
- Q.8. What are the primary functions of VFS?
- Q.9. What do you understand by a shell?
- Q.10. What is metacharacter?

P.T.O.

PART B

(Attempt all 5 short answer type questions, 4 marks each)

- Q.1. What are different process states. Explain the possible movement of a process between the states.
- Q.2. What is an interrupt? How it is differ with the Polling mechanism?
- Q.3. Suppose that we have free segments with sizes: 6, 17, 25, 14, and 19. Place a program with size 13kB in the free segment using first-fit, best fit and worst fit?
- Q.4. Explain all the requirements from a solution of the critical-section problem?
- Q.5. Explain the four stages of the Linux Process.

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PART C

(Attempt all 5 long answer type questions, 8 marks each)

Q.1. Consider the following set of processes, with the length of the CPU-burst given in milliseconds:

Process	Burst Time	Priority
P1	3	2
P2	2	1
P3	10	4
P4	3	2
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, and P5, all at time 0. Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a non-preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1) scheduling. Also, mention the turnaround time of each process for each of the following scheduling algorithm?

Q.2. What is the hardware support required to implement demand paging? Write down the steps involved in handling a page fault during the demand paging. Explain two page replacement algorithm.

P.T.O.

Q.3. List the two models of interprocess communication? What are the strengths and weakness of the two approaches?

Q.4. Suppose that a disk drive has 5,000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 2150, and the previous request was at cylinder 1805. The queue of pending requests, in FIFO order, is :

2069, 1212, 2296, 2800, 544, 1618, 356, 1523, 4965, 3681

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk-scheduling algorithms?

A. SSTF

B. SCAN

C. LOOK

D. C-SCAN

[2x4=8]

Q.5. Write a short note on any of the two topics among the following topics

[4+4=8]

A. Debugging in the shell program?

B. File systems and types of the files in UNIX OS

C. Shell Programming in bash
