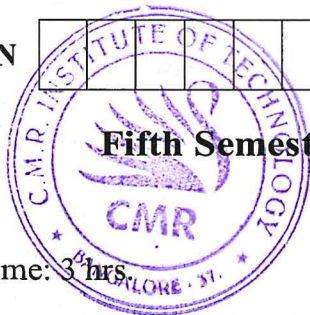


# CBCS SCHEME

15EC553

USN

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## Fifth Semester B.E. Degree Examination, July/August 2021 Operating System

Time: 3 hrs

Max. Marks: 80

**Note: Answer any FIVE full questions.**

- Define computational structure. Explain and list computational structures and OS responsibilities. (08 Marks)
  - Explain the strategies for resource allocation. Also explain CPU sharing and memory sharing. (08 Marks)
- Why I/O bound programs should be given higher priority in a multiprogramming class of OS? Illustrate with timing diagram. (08 Marks)
  - Write short notes on real time operating system and distributed class of OS. (08 Marks)
- With fundamental state transition diagram, explain the functions of states and causes of fundamental state transitions for a process. (08 Marks)
  - Explain scheduling of user level threads. Illustrate with example how thread library manages threads in a process. (08 Marks)
- Define the terms:
    - Response ratio
    - Turn around time
    - Preemption
    - Throughput. (04 Marks)
  - What are the functions of long, medium and short term scheduling in a time sharing system? (05 Marks)
  - Determine mean turnaround time and mean weighted turnaround time using LCN preemptive scheduling policy for the following process. Assume time slice of 1sec.

Process	P1	P2	P3	P4	P5
Arrival time	0	2	3	5	9
Service time	3	3	2	5	3

(07 Marks)

- With neat sketch, explain how to calculate effective memory address in non-contiguous loading of process. (08 Marks)
  - Define external fragmentation and internal fragmentation. Compare contiguous and non-contiguous memory allocation techniques. (08 Marks)
- Explain the concepts involved in demand loading of a page with example. (08 Marks)
  - Consider the following page reference and reference time string for a process:

Page reference string	5	4	3	2	1	4	3	5	4	3	2	1	5
Reference time string	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>	t <sub>5</sub>	t <sub>6</sub>	t <sub>7</sub>	t <sub>8</sub>	t <sub>9</sub>	t <sub>10</sub>	t <sub>11</sub>	t <sub>12</sub>	t <sub>13</sub>

Calculate the number of page fault generated by using FIFO and LRU page replacement policy for allocation = 4. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

- 7 a. Explain sequential and index sequential file organization in file system. Also write fields in the file control block. (08 Marks)  
b. Explain the methods involved in the allocation of disk space. (08 Marks)
- 8 a. Explain file types, file attributes and file operations. (08 Marks)  
b. Explain the file system actions at a file operation with example. (08 Marks)
- 9 a. Write the issues in message passing. Explain delivery of interprocess messages with kernel actions to implement message passing using symmetric naming and blocking sends. (08 Marks)  
b. Define mailbox and mention its advantages with neat figure, explain message passing using a mailbox. (08 Marks)
- 10 a. Define deadlock Explain deadlock detection algorithm with example. (08 Marks)  
b. With necessary figure, explain the different deadlock prevention approaches. (08 Marks)

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