USN ☐☐☐☐☐☐☐☐☐☐   **17EC553**

Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024
Operating System

Time: 3 hrs.   Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a. Explain goals of an OS.   **(06 Marks)**
     b. Explain pool based and partition based resource allocation strategies with figures. **(06 Marks)**
     c. Explain various classes of OS with an emphasis on prime concern and key concepts used.
                                                                                     (08 Marks)

OR

2   a. With a neat diagram, explain time sharing system. Define time slice and preemption.
                                                                                     (06 Marks)
     b. Describe the following :
        (i)   Architectural support required for multiprogramming.
        (ii)   Concept and Techniques employed in multiprogramming.   **(07 Marks)**
     c. Describe the following :
        (i)   Features of Distributed OS.
        (ii)   Features of Real time OS.   **(07 Marks)**

Module-2

3   a. With the help of a process state transition diagram, explain fundamental process state transitions.   **(10 Marks)**
     b. With the help of figures, explain scheduling in Kernel level and User level threads.
                                                                                     (10 Marks)

OR

4   a. Apply FCFS and SRN scheduling policies and find mean turn around time and weighted turnaround for the process shown below:

Process	P_1	P_2	P_3	P_4	P_5
Arrival time	0	2	3	4	8
Service time	3	3	5	2	3

                                                                                     (10 Marks)
     b. Apply RR scheduling policy and find the following for the processes shown below :
        (i)   Mean turnaround time.
        (ii)   Mean weighted turn around.

Process	P_1	P_2	P_3	P_4	P_5
Arrival time	0	2	3	5	9
Service time	3	3	2	5	3

                                                                                     (10 Marks)

Module-3

5 a. Define following :
   (i)   Memory fragmentation
   (ii) External fragmentation.
   (iii) Internal fragmentation
   (iv) Memory compaction
   (v)   Reuse of memory (06 Marks)
   b. Write short notes on :
   (i)   Paging
   (ii) Segmentation
   (iii) Paging in segmentation (08 Marks)
   c. Compare contiguous and non contiguous memory allocation. (06 Marks)

OR

6 a. Explain functions of paging hardware. (04 Marks)
   b. Explain function of Virtual Memory manager. (06 Marks)
   c. Apply FIFO and LRU page replacement policies and find the number of page faults in each case. For the following page reference string of a process. Assume alloc = 3
   Page reference string :   5, 4, 3, 2, 1, 4, 3, 5, 4, 3, 2, 1, 5
   Reference time string : $t_1, t_2, t_3, t_4, t_5, t_6, t_7, t_8, t_9, t_{10}, t_{11}, t_{12}, t_{13}$
   (10 Marks)

Module-4

7 a. List the facilities provided by the file system and IOCS. (04 Marks)
   b. Explain the file operations performed by the process. (08 Marks)
   c. With a neat diagram, explain index sequential file organization. (08 Marks)

OR

8 a. Explain (i) Linked allocation of disk space.
            (ii) Indexed allocation of disk space. (10 Marks)
   b. With an example, explain (i) File open actions   (ii) File close actions (10 Marks)

Module-5

9 a. Explain (i) Direct and Indirect naming   (ii) Blocking and Non blocking send. (08 Marks)
   b. Write short notes on Mailbox. (06 Marks)
   c. What are the advantages of Mail box? (06 Marks)

OR

10 a. Identify the events related to resource allocation and explain them briefly. (06 Marks)
   b. Identify the conditions for resource dead lock. (08 Marks)
   c. Explain different approaches for handling dead locks. (06 Marks)

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