CBCS SCHEME

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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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