CBCS SCHEME

USN | | | | | | | | | | |

15EC553

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022
Operating Systems

Time: 3 hrs. Max. Marks: 80

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

Module-1

1 a. Explain the fundamental goals of an O.S. **(06 Marks)**

b. Explain resource allocation strategies of an O.S. **(05 Marks)**

c. Using I/O bound programmes should be given higher priorities in a multiprogramming environment? Illustrate with timing diagram. **(05 Marks)**

OR

2 a. What are the common tasks performed by an operating system? **(05 Marks)**

b. Explain turn around time in batch processing system. **(05 Marks)**

c. What are the features that a computer must posses to support for multiprogramming? **(06 Marks)**

Module-2

3 a. What are fundamental process states? With a figure explain the fundamental state transitions for a process. **(05 Marks)**

b. What are the advantages of threads over process? **(05 Marks)**

c. For the following given process for scheduling:

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

Calculate mean turn around time and mean weighted turn around using FCFS scheduling. **(06 Marks)**

OR

4 a. Explain the different fields of the PCB data structure used in process management. **(05 Marks)**

b. With a figure explain long, medium and short term scheduling in a time sharing system. **(05 Marks)**

c. For the following given process for scheduling:

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

Calculate the mean turn around time and mean weighted turn around using round-robin scheduling with time slicing of 1 unit time. **(06 Marks)**

Module-3

5 a. Give a comparison of continuous and non continuous memory allocation. **(05 Marks)**

b. Explain what are the functions performed by paging hard ware. **(05 Marks)**

c. The page reference string for a process is as follows:
Page reference string : 5, 4, 3, 2, 1, 4, 3, 5, 4, 3, 2, 1, 5.
For given page frame size of 3. Calculate the total number of page faults using FIFO page replacement policy. **(06 Marks)**

OR

6 a. Explain the steps in address translation by the memory management unit. **(05 Marks)**

b. Explain the functions of the virtual memory manager. **(05 Marks)**

c. The page reference string for a process is as follows:
Page reference string : 1, 2, 3, 4, 2, 5, 3, 4, 2, 6, 7, 8, 7, 9, 7, 8, 2, 5, 4, 9
For a given page frame size of 4. Calculate the total number of page faults using LRU page replacement policy. **(06 Marks)**

Module-4

7 a. What are the facilities provided by the file system and the input-output control system. **(05 Marks)**

b. Explain with neat diagram, the directory structure composed of master and user directories. **(05 Marks)**

c. With a diagram, explain the linked allocation of disk space. **(06 Marks)**

OR

8 a. Explain the different fields in the file control block (FCB). **(05 Marks)**

b. With a neat figure explain the directory tree of the file system. **(05 Marks)**

c. Explain with a figure the implementation of file access for a file system actions at open. **(06 Marks)**

Module-5

9 a. What are the issues in implementing message passing and give the uses of message passing. **(05 Marks)**

b. List some of the exceptional conditions in message passing. **(05 Marks)**

c. Give the different approaches for deadlock prevention. **(06 Marks)**

OR

10 a. Explain mailbox. Give the advantages of mail box. **(06 Marks)**

b. With a simple example, explain the resource allocation state of a system using,
(i) Graph model
(ii) Matrix model. **(06 Marks)**

c. The allocation state of a system containing 10 units of a resources class R_1 and three processes $P_1 - P_3$ is as follows:

	R_1
P_1	4
P_2	4
P_3	2

Allocated Resources

	R_1
P_1	6
P_2	2
P_3	0

Requested Resources

	R_1
Total resources	10
Free resources	0

Check for deadlock exist or not in the system when the simulation ends. **(04 Marks)**

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