CBCS SCHEME

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15CS64

Sixth 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. Define an Operating System. Discuss its role from different perspectives. **(06 Marks)**

b. Give the features of symmetric and asymmetric multiprocessor system. **(04 Marks)**

c. Write and explain the sequence of system calls for copying a file to another new file. **(06 Marks)**

OR

2 a. Explain the concept of virtual machine. Bring out its advantages. **(05 Marks)**

b. Describe the process states with the help of state diagram. **(05 Marks)**

c. Describe the implementation of IPC using shared memory and message passing. **(06 Marks)**

Module-2

3 a. Discuss the different multithreaded modules. **(05 Marks)**

b. Consider the following process:

Process	AT	BT
P_1	0	8
P_2	1	4
P_3	2	9
P_4	3	5

(i) Draw a Gantt chart to show execution of FCFS, preemptive SJF and non-preemptive SJF.

(ii) Calculate average waiting and turnaround time. **(06 Marks)**

c. Explain different scheduling criteria for choosing different scheduling algorithms. **(05 Marks)**

OR

4 a. What is critical section problem? Explain the 3 requirements that must be satisfied by the solution to critical section problem. **(05 Marks)**

b. Write a note on semaphore. **(05 Marks)**

c. With the necessary syntax describe the term monitor. Explain the solution to classical dinning philosopher's problem using monitor. **(06 Marks)**

Module-3

5 a. Define deadlock. Explain necessary condition for deadlock to occur. **(06 Marks)**

b. Consider the following snapshot of a system:

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

Answer the following questions using Banker's algorithm:

(i) What is the content of matrix need?

(ii) Is the system in a safe state?

(iii) If the request from process P_1 arrives for (0, 4, 2, 0) , can the request be granted immediately. **(10 Marks)**

OR

6 a. Differentiate between :

(i) Internal and External fragmentation

(ii) Paging and segmentation. **(08 Marks)**

b. Why Translation Look aside Buffer (TLB) is important in paging system? Explain. **(08 Marks)**

Module-4

7 a. What is demand paging? Discus the steps involved in handling page fault with neat diagram. **(08 Marks)**

b. Consider the following page reference string

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

for memory with three frames. How many page faults would occur for LRU, FIFO and optimal page replacement algorithm? **(08 Marks)**

OR

8 a. What is a file? Explain different file allocation methods. **(10 Marks)**

b. With a neat diagram describe

(i) Tree structural directory

(ii) Acyclic graph directory **(06 Marks)**

Module-5

9 a. Suppose the position of cylinder is at 53. Sketch the graphical representation for the queue of pending resources in order 98, 183, 37, 122, 14, 124, 65, 67 for FCFS, SSTF, SCAN and Look scheduling schemes. **(10 Marks)**

b. Explain access matrix with example. **(06 Marks)**

OR

10 a. Explain the components of a Linux system. **(08 Marks)**

b. Explain the Linux device driver with block structure. **(08 Marks)**

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