USN | | | | | | | | | |

10CS53

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Operating System

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. Write and explain the sequence of system call cervices those are helpful for copying a file to another (new) file. **(06 Marks)**

b. Discuss the Operating System functions that are (i) helpful to user (ii) meant for ensuring the efficient operation of system. **(10 Marks)**

c. List the advantages of multiprocessor system. Explain "graceful degradation" and "fault tolerant" in a multiprocessor system. **(04 Marks)**

2 a. Explain Process State with diagram. What is the need for context switch? Explain fields of PCB. **(06 Marks)**

b. Consider four jobs as following. Find waiting time, turnaround time and hence average waiting time and average turnaround time using preemptive SJF and RR (with quantum time = 1) scheduling algorithms. If quantum time is set to 2, what is the behavior of RR? Comment on this.

Jobs	P_1	P_2	P_3	P_4
Arrival time	0	0.2	0.6	1.2
Burst time	5	2	8	4

(10 Marks)

c. Why thread is called LWP? Describe anyone threading model and threading issue. **(04 Marks)**

3 a. What are the three requirements to be met by a solution to the critical section problem? Explain. **(06 Marks)**

b. Describe the bounded-buffer problem and give a solution for the same using semaphores Write the structure of procedure and consumer processes. **(07 Marks)**

c. Describe Dining-Philosopher problem in detail. **(07 Marks)**

4 a. In a Resource-allocation graph (algorithm), "If each resource type has several instances, then a cycle does not necessarily imply that a deadlock has occurred." Justify this statement with suitable example. **(04 Marks)**

b. Consider the following snapshot of a system

Processes	Allocation				Maximum				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 stepwise.
(i) What is the content of matrix need?
(ii) Is the system in a safe state?
(iii)If request from process P_1 arrives for (0, 4, 2, 0) can the request be granted immediately? **(12 Marks)**

c. Describe the features that characterize deadlocks. (04 Marks)

PART – B

5 a. Explain the concept of forward-mapped page table. (05 Marks)
b. Explain the steps in handling page faults with neat diagram. (05 Marks)
c. Consider following page reference strings.
1 2 3 4 2 1 5 6 2 1 2 3 7 6 3 2 1 2 3 6. How many page faults would occur in case of LRU, FIFO and OPT page replacement algorithms assuming memory with 5 frames? Which is the most efficient algorithm? (10 Marks)

6 a. Explain File Attributes and File operations. (12 Marks)
b. Explain different file access methods. (08 Marks)

7 a. A disk drive has 200 cylinders numbered 0 to 199. Drive is currently servicing request at 53. Queue of pending requests in FIFO order are 98, 183, 37, 122, 14, 124, 65, 67. Starting from current head position, what is the total distance that the disk arm moves in cylinders to satisfy all pending requests for FCFS, SSTF, LOOK, SCAN disk scheduling algorithms with figures in each case. (12 Marks)
b. What is Access Matrix? Explain with domains as objects. (08 Marks)

8 Write short notes on :
a. Components of LINUX system
b. IPC facility in LINUX
c. SCAN and C-SCAN disk scheduling algorithms
d. Tree directory structure. (20 Marks)

* * * * *