



M.Sc. II Semester Degree Examination, September/October - 2022

COMPUTER SCIENCE

21CSC2C8L (DSC-8) : Operating System

Time : 3 Hours

Maximum Marks : 70

Instruction : Answer **any five** of the following with question no. **1 compulsory**.

1. (a) How does system call works ? Explain with neat diagram. Explain the types of system calls. 7
- (b) How do you define operating system in user and system perspective point of view ? 7
2. (a) Illustrate with a neat sketch of process control block. 7
- (b) Consider the following set of processes with the length of CPU burst time given in milliseconds. 7

Process	Arrival time	Burst time	Priority
P ₁	0	12	4
P ₂	2	10	3
P ₃	3	14	5
P ₄	6	16	1
P ₅	30	5	1

- (i) Draw Gantt charts illustrating execution of these processes using pre-emptive SJF and non-pre-emptive priority scheduling algorithms.
- (ii) Compute turnaround time and waiting time for each process in each of the scheduling algorithm in (i) and find which of them results in minimum average waiting time and turnaround time.
3. (a) Consider the following snapshot of a system. 7

	<u>Allocation</u>				<u>Max</u>			
	A	B	C	D	A	B	C	D
P ₀	3	0	1	4	5	1	1	7
P ₁	2	2	1	0	3	2	1	1
P ₂	3	1	2	1	3	3	2	1
P ₃	0	5	1	0	4	6	1	2
P ₄	4	2	1	2	6	3	2	5

Using the banker's algorithm, determine whether or not each of the following states is unsafe. If the state is safe, illustrate the order in which the processes may compute. Otherwise, illustrate why the state is unsafe.

- (i) Available = (0, 3, 01)
- (ii) Available = (1, 0, 0, 2)
- (b) What is semaphore and explain its problems with necessary modification of PV operations ? 7



4. (a) Explain the paging hardware with TLB. 7
(b) What will be the EAT if hit ratio is 70%, time for TLB is 30 ns and access to main memory is 90 ns ? 7
5. (a) For the following page reference string : 7
7 0 1 2 0 3 0 4 2 3 0 7 1
Calculate the page faults using FIFO and LRU for memory with 3 and 4 frames.
(b) Explain the concept of thrashing and enlist the cause & of thrashing. 7
6. (a) Differentiate between threads and processes. 7
(b) With a neat diagram, explain resource allocation graph. 7
7. (a) Explain swapping process with a neat diagram. 7
(b) Explain various page replacement algorithms with an example. 7
8. (a) Explain the file concept and enlist the common file attributes irrespective of any operating system. 5
(b) Write a short notes on address binding. 5
(c) Draw a neat sketch of process state diagram. 4

