MCA 3rd Sem-2019

Full Marks-70

Time: 3 hours

The questions are of equal value. Answer all questions.

1. (a) Differentiate between system calls and system programs
   (b) Explain how I/O device interrupt is handled by OS

OR

   (a) What is buffering? Explain its utility.
   (b) Explain how I/O protection is provided by the OS.

2. (a) Write the functions of 3 kinds of schedulers used in process scheduling.
   (b)What is SJF scheduling? Using SJF, calculate average TAT and WT for the following set of processes.

Process	Arrival Time	Burst Time
A	0	6
B	1	3
C	2	8
D	3	7

OR

Differentiate between preemptive and non-preemptive scheduling. Calculate average TAT and WT for the following set of processes, using FCFS and RR (TQ=2) algorithms.

Process	Arrival Time	Burst Time
A	0	5
B	1	4
C	2	2
D	3	4

3. (a) What is critical-section problem? Explain the three requirements that a solution to critical-section problem must satisfy.
   (b)Write and explain the two-process solution to critical-section problem.

OR

(a) What is system deadlock? Discuss the necessary conditions for a deadlock to occur.
(b) Write the Bankers' algorithm and Safety algorithm used for deadlock avoidance. Check if the following resource allocation state is safe with 12 numbers of resources.

Process	Max Needs	Current Allocation
A	10	5
B	4	2
C	9	2

4. (a) What is paging? Discuss how job scheduling is done under paging system.
   (b)Differentiate between static and dynamic address binding. Explain their relative advantages and disadvantages.

OR

(a) Differentiate between MFT and MVT.
(b) What is segmentation? Give the segment table as:

Segment	Base	Length
0	330	124
1	876	211
2	111	99
3	498	302

Compute the physical addresses for each of the logical addresses (0, 99), (2, 78), (1, 265), (3, 222) and (0, 111).

5. (a) What is virtual memory? How is it implemented? Explain.
   (b) What is Belady's anomaly? Why does it occur? Explain with a suitable example.

OR

Discuss various file allocation methods being available. Write their relative advantages and disadvantages.