DEPARTMENT OF IMCA, UTKAL UNIVERSITY, VANI VIHAR

3rd END Semester Examination-2019

Full Mark: **70** Sub: **OS** Paper: **3.3**

Answer **ALL** Questions.

Q1. (i) What do you mean by operating system? Explain different services provided by operating system? [7]

(ii) Discuss different types of operating systems along with it's user interface? [7]

OR

(i) Define system call? How a system call is implemented? Explain different types of system calls in detail? [10]

(ii) With a suitable diagram, explain the operating modes of OS. [4]

Q2. (i) Define process? How is it different from a program? [4]

(ii) What do you mean by process state? Explain different process states with a suitable diagram along with PCB? [10]

OR

(i) Discuss the multithreading models with suitable diagrams? [4]

(ii) What is IPC? Explain different ways of communications in IPC with suitable examples? [10]

Q3.(i) Discuss the CPU scheduling criteria? [4]

(ii) Consider the following set of processes with the length of the CPU burst time, arrival time (in milliseconds) and priority. [10]

Process	CPU Burst Time	Arrival Time	Priority
P1	3	0	1
P2	2	1	0
P3	4	3	2
P4	5	4	0
P5	3	5	1

Draw four Gantt charts for the execution of these processes using FCFS, SJF , Priority(a smaller number implies a higher priority) and RR with quantum=1 scheduling.
(i) What is the turnaround time of each process for each of the scheduling algorithms?
(ii)What is the waiting time of each process for each of the scheduling algorithms?
(iii) Which case the average waiting time is minimum?

OR

(i) Explain at least two types of classic problem of synchronization? [4]

(ii) Define Critical Section Problem? Discuss different types of solutions to CSP? [10]

Q4. (i)Define deadlock? What are it's necessary conditions? [4]

(ii) Consider the following snapshot of a system: [10]

Process	Allocation A B C D	Max A B C D	Available A B C D
P0	0 0 1 2	0 0 1 2	1 5 2 0
P1	1 0 0 0	1 7 5 0	
P2	1 3 5 4	2 3 5 6	
P3	0 6 3 2	0 6 5 2	
P4	0 0 1 4	0 6 5 6	

Answer the following questions using Banker's algorithm:
(I) The Need matrix
(ii) Is the system in a safe state? If so, what is the safe sequence?
(iii) If a request from process P2 arrives for (1,2,0,1) , can the request be granted immediately?

OR

(i)Define paging? How a page differs from a frame? [4]

(ii) What do you mean by contiguous memory allocation? Explain different types of memory allocation techniques with a suitable example? [10]

Q5. (i)What is virtual memory? Explain in detail demand paging? [4]

(ii) Consider the following page reference string: [10]

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 the following replacement algorithms if the frame size is 2 frames?
(I) LRU replacement
(ii) FIFO replacement
(iii) Optimal replacement

OR

(i) What is a file? Explain its attributes, types, access methods and operations? [7]

(ii) Define directory? Discuss directory structure with a suitable diagram along with advantages and disadvantages? [7]