S.Y. B.SC (INFORMATION TECHNOL.OGY) - SEM-III
SUB: OPERATING SYSTEM
PUNE VIDHYARTHI GRIHA'S
COLLEGE OF SCIENCE AND TECHNOLOGY
SET: 1

Q.P CODE: USIT304 (TIME:2 ½ Hrs.) TOTAL MARKS:75

N.B:-

1. All questions are compulsory.
2. Answers to the same question must be written together.
3. Numbers to the right indicate full marks.
4. Draw neat labeled diagrams wherever necessary.
5. Use of Non-programmable calculators are allowed.

Q1) Attempt the following (Any three) (Each of 5 marks) **[15M]**

A) Explain the various functions of the operating system.
B) Explain Different types of computing environments.
C) Explain the various models of O.S.
D) Explain the message-passing model in Interprocess communication.
E) List the types of system cells.
F) Explain the concept process state of the process control block.

Q2) Attempt the following (Any three) (Each of 5 marks) **[15M]**

A) Explain the concept of thread in detail.
B) Explain the concept of multicore programming.
C) What is a bounded buffer solution?
D) Explain the Dining philosopher problem.
E) Explain the reader writer's problem.
F) Explain what race condition is with a print spooler example.

Q3) Attempt the following (Any three) (Each of 5 marks) **[15M]**

A) Explain the Scheduling criteria.
B) Consider the following set of processes with length of CPU Arrival time and burst time given in milliseconds Illustrate the execution of these processes using the FCFS scheduling algorithm Calculate wait time, average wait time and turn-around time, and average tum around the time of each process also draw the Gantt Chart. Consider

Process	Arrival Time	Burst time
P1	0	9
P2	0	6
P3	0	7
P4	0	8
P5	0	12

C) Consider the following set of processes with the length of CPU arrival time and burst time given in milliseconds illustrate the execution of these processes using SJF pre-emptive scheduling algorithm to calculate wait time, average wait time and turnaround time, average turnaround time of each process also draw the Gantt char consider

Process	Arrival Time	Burst time
P1	0	8
P2	1	13
P3	2	5
P4	3	11
P5	4	4

D) Consider the following set of processes with a length of CPU arrival time and burst time given in milliseconds illustrate the execution of this process using the Round Robin scheduling algorithm to calculate weight time average weight time and turnaround time, average turnaround time of each process also draw Gantt chart. T.Q = 2

Process	Arrival Time	Burst time
P1	0	4
P2	1	5
P3	2	2
P4	3	1
P5	4	6
P6	5	3

E) Explain the FCFS algorithm with an example.
F) Between FCFS and SJF algorithms which one is better and why?

Q4) Attempt the following (Any three) (Each of 5 marks) **[15M]**

A) What are the methods for handling deadlocks?
B) Explain the deadlock characterization.
C) Explain recovery from deadlock.
D) Explain hold and wait in Deadlock.
E) Write a short note on Prevention in handling deadlock.
F) What is resource pre-emption and what three issues need to be addressed?

Q5) Attempt The following (Any three) (Each of 5 marks) **[15M]**

A) Write a short note on 1) logical and 2) physical address space.
B) Explain the concept of partitions and mounting
C) Explain The concept of disk formatting in detail
D) What are the basic requirements of a page replacement algorithm?
E) Explain swapping.
F) Difference between Logical address and Physical address.