BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: BE **SEMESTER: IV**
BRANCH: CSE **SESSION : SP/2019**

SUBJECT : CS4107 OPERATING SYSTEM

TIME: 1.5 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1 (a) Describe how operating system is able dynamically stop and resume execution of processes in a multiprogramming system? [2]

(b) (i) Differentiate between batch processing, multiprogramming and time sharing operating system. [3]
(ii) Differentiate between acyclic graph and general graph directory structure.

Q2 (a) In some systems, a subdirectory can be read and written by an authorized user, just as ordinary files can be. [2]
(i) Describe the protection problem that could arise.
(ii) Suggest a scheme for dealing with each of the protection problems you named in part a.

(b) (i) Explain the advantages and disadvantages of contiguous file allocation scheme. [3]
(ii) Compare index file allocation to noncontiguous file allocation.

Q3 (a) Give two examples of preemptive scheduling algorithms. Write one advantage and one disadvantage of each. [2]

(b) For the following example, show the processes present in the ready queue after 4ms for the RR scheduling algorithm with time quantum as 2 ms- [3]

Processes	Arrival Time	Burst Time
P1	0	4
P2	1	5
P3	2	3
P4	3	6
P5	4	2

Write the condition when RR scheduling algorithm behave as a FCFS.

Q4 (a) What advantage is there in having different time quantum sizes on different levels of a multilevel queuing system? [2]

(b) Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:(Assume 1: high priority and 4: low priority) [3]

Process	Burst time	Priority
P_1	10	3
P_2	1	1
P_3	2	3
P_4	1	4
P_5	5	2

The processes are assumed to have arrived in the order P_1, P_2 …. P_5 all at time 0.
(i) Draw four Gantt charts illustrating the execution of these process using FCFS, SJF (non-preemptive priority) and RR(quantum = 1) scheduling.
(ii) What is the turnaround time of each process for each of the scheduling algorithms in part i?
(iii) What is the waiting time of each process for each of the scheduling algorithms in part i.
(iv) Which of the schedules in part a results in the minimal average waiting time?

PTO