

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

**CLASS: BE  
BRANCH: IT**

**SEMESTER: IV  
SESSION : SP/2019**

**SUBJECT: IT4023 OPERATING SYSTEM CONCEPTS**

**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.
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- Q1 (a) How the Batch processing systems are different from Multi-programming systems? [2]  
(b) Discuss the services provided to the users by the Operating Systems. [3]
- Q2 (a) Present a schematic diagram of the architecture of the Windows operating system and discuss it. [2]  
(b) Discuss category-wise list of system calls and their roles. [3]
- Q3 (a) Currently a program 'pgm1' is inside main memory. What are the possible process states? Explain. [2]  
(b) What are the basic mechanisms of IPC? Discuss those with relative pros and cons. [3]
- Q4 (a) Discuss the components of a process control block. [2]  
(b) What do you mean by Threads? Why are these required? Discuss with suitable example. [3]
- Q5 (a) Suppose that the following processes arrive for execution at the times indicated. Each process will run the listed amount of time. [5]
- | Process | Arrival Time | CPU Burst |
|---------|--------------|-----------|
| P1      | 0            | 8         |
| P2      | 1            | 4         |
| P3      | 2            | 9         |
| P4      | 3            | 1         |
| P5      | 10           | 2         |
| P6      | 13           | 3         |
- Show in Gantt Chart to use Shortest Job First, Shortest Remaining Time First, Round Robin scheduling (time quantum 2 unit) and Find average waiting time for these processes.
- Q6 (a) Consider a scheduling algorithm named "Highest Response Ratio Next" algorithm. The Response Ratio is defined as:  $(\text{Waiting Time} + \text{Burst time}) / \text{Burst time}$ . Now apply this algorithm on the dataset given in Q.No. 5(a) and find the average waiting time. [2]  
(b) How the performance of round robin algorithm is dependent on Time Quantum? What should be good value of time quantum? Take suitable example and discuss. [3]

::: 02/03//2019 E:::