Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17CS2013** | **Duration :** | **3hrs** |
| **Sub. Name :** | **OPERATING SYSTEM** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Outline the operating system services that provide functions that are helpful to the user and ensures efficient operation of the system. | CO1 | 10 |
| b. | Illustrate the details of a modern computer system and illustrate storage and I/O structure. | CO1 | 10 |
| (OR) | | | | |
| 2. |  | Point out the purpose of system calls. Categorize and explain its types. | CO1 | 20 |
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| 3. |  | Consider the following set of processes, with the length of the CPU burst given in milliseconds:  **Process Burst Time Priority**  P1 2 2  P2 1 1  P3 8 5  P4 4 4  P5 5 3  The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.  a) Draw four Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF,  Priority (a larger priority number implies a higher priority), and RR (quantum = 4).  b) What is the turn around time of each process for each of the scheduling algorithms in part a?  c) What is the waiting time of each process for each of these scheduling algorithms?  d) Which of the algorithms results in the minimum average waiting time (over all processes)? | CO3 | 20 |
| (OR) | | | | |
| 4. | a. | As a process executes, it changes state - Discuss the different states of a process and highlight about process control block. | CO2 | 10 |
| b. | Show how cooperating processes communicate with each other through message passing system. | CO2 | 10 |
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| 5. | a. | Investigate the necessity for process synchronization. Illustrate a software based peterson’s solution to the critical section problem. | CO1 | 10 |
| b. | Paging is a memory management scheme. Draw the Paging hardware diagram. Write the working procedure of paging hardware in detail. | CO1 | 10 |
| (OR) | | | | |
| 6. | a. | Illustrate the significance of resource allocation graph. | CO5 | 10 |
| b. | Discuss any two classical problems of Synchronization in detail. | CO4 | 10 |
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| 7. | a. | Consider the following page reference string:  7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1  How many page faults would occur for the following replacement algorithms: LRU, FIFO, and Optimal, assuming three frames that all frames are initially empty? | CO6 | 10 |
| b. | Review the basic concept of demand paging and show the steps in handling a page fault. | CO1 | 10 |
| (OR) | | | | |
| 8. | a. | Describe the most common schemes for defining the logical structure of a directory. | CO1 | 10 |
| b. | Write short notes on attributes of file and file operations. | CO1 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. |  | Consider the following requests are in the disk queue:  98, 183, 37,122, 14, 124, 65, 67  Head starts at: 53  Explain the procedure to provide services for above request sequence with the help of different disk scheduling algorithms. (with proper block diagrams) | CO6 | 20 |