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

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **14CS2037** | **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. | Illustrate how operating system acts as a resource manager. | CO1 | 10 |
| b. | Explain about dual modes of operation in operating system with neat diagram. | CO1 | 10 |
| (OR) | | | | |
| 2. |  | Illustrate the different types of system calls with suitable examples. | CO1 | 20 |
| 3. | a. | Describe the process lifecycles and PCB with neat illustrations. | CO1 | 10 |
|  | b. | Discuss the various multithreading models with suitable diagrams. | CO1 | 10 |
| (OR) | | | | |
| 4. |  | Consider the following set of process, with the arrival times and CPU burst time given in milliseconds.   |  |  |  | | --- | --- | --- | | Process | Arrival Time | Burst Time | | P1 | 0 | 20 | | P2 | 15 | 25 | | P3 | 30 | 10 | | P4 | 35 | 15 |  1. Draw four different Gants charts illustrating the execution of these process using FCFS, SJF, and RR(quantum=3) scheduling. 2. What is the turnaround time of each process for each of the scheduling algorithms in part a? 3. What is the waiting time of each process for each of the scheduling algorithms in part a? 4. Which of the schedules in part a result in the minimal average waiting time (over all process)? | CO2 | 12+3+3+2 |
|  |  |  |  |  |
| 5. |  | Explain the following process synchronization with suitable examples.   1. Readers Writers problem. 2. Dinning Philosophers problem. | CO3 | 10+10 |
| (OR) | | | | |
| 6. |  | A System consists of 5 processes (P1, P2, P3, P4, P5) and 3 resources (R1, R2, R3). Resource type R1 has 10 instances, R2 has 5 instances, and R3 has 7 instances. The following snapshot of the system has been taken. Solve resource allocation using Banker’s algorithm.   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Process | Allocation | | | Max needs | | | Available | | | | R1 | R2 | R3 | R1 | R2 | R3 | R1 | R2 | R3 | | P1 | 0 | 1 | 0 | 7 | 5 | 3 | 3 | 3 | 2 | | P2 | 2 | 0 | 0 | 3 | 2 | 2 |  | | | | P3 | 3 | 0 | 2 | 9 | 0 | 2 | | P4 | 2 | 1 | 1 | 2 | 2 | 2 | | P5 | 0 | 0 | 2 | 4 | 3 | 3 |  1. What is the content of the need matrix? 2. Is the system is in safe state? If it is write the safe sequence 3. If the request from process P1 arrives for (4, 3, 3) can the request be granted immediately? | CO2 | 10+5+5 |
|  |  |  |  |  |
| 7. | a. | Differentiate internal and external fragmentation in memory allocation method. | CO3 | 5 |
| b. | Explain the concept of paging with neat diagram. | CO3 | 15 |
| (OR) | | | | |
| 8. |  | Explain in detail about different types of directory structure in file system with neat diagrams. | CO3 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Differentiate and explain the following disk scheduling algorithms with suitable example.  i. FCFS  ii. SSTF  iii. SCAN  iv. LOOK  v. C-SCAN | CO2 | 3+3+3+3+3 |
| b. | Summarize Kernel I/O system. | CO3 | 5 |