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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14CS2037** | **Duration :** | **3hrs** |
| **Sub. Name :** | **Operating System** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | | | | **Course outcome** | **Marks** |
| **PART-A (40X1=40 MULTIPLE CHOICE QUESTIONS)** | | | | | | |
| 1. | If no cycle exists in the resource allocation graph : | | | | C1 |  |
|  | a. then the system will not be in a safe state | b. then the system will be in a safe state | c. either a or b | d. None of Options |  | (1) |
| 2. | If we preempt a resource from a process, the process cannot continue with its normal execution and it must be: | | | | C1 |  |
|  | a. aborted | b. rolled back | c. terminated | d. queued |  | (1) |
| 3. | A process holding at least one resource and waiting to acquire additional resources held by other processes is called \_\_\_\_\_\_\_\_\_\_\_\_\_. | | | | C1 |  |
|  | a. Mutual exclusion | b. No Preemption | c. Hold and wait | d. Circular wait |  | (1) |
| 4. | An edge from process Pi to Pj in a wait for graph indicates that : | | | | C1 |  |
|  | a. Pi is waiting for Pj to release a resource that Pi needs | b. Pj is waiting for Pi to release a resource that Pj needs | c. Pi is waiting for Pj to leave the system | d. Pj is waiting for Pi to leave the system |  | (1) |
| 5. | Given a priori information about the \_\_\_\_\_\_\_\_ number of resources of each type that maybe requested for each process, it is possible to construct an algorithm that ensures that the system will never enter a deadlock state. | | | | C1 |  |
|  | a. Maximum | b. Minimum | c. Approximate | d. Average |  | (1) |
| 6. | A state is safe, if : | | | | C1 |  |
|  | a. the system does not crash due to deadlock occurrence | b. the system can allocate resources to each process in some order and still avoid a deadlock | c. the state keeps the system protected and safe | d. All of these |  | (1) |
| 7. | A system is in a safe state only if there exists a : | | | | C1 |  |
|  | a. safe allocation | b. safe resource | c. safe sequence | d. All of these |  | (1) |
| 8. | The number of resources requested by a process : | | | | C1 |  |
|  | a. must always be less than the total number of resources available in the system | b. must always be equal to the total number of resources available in the system | c. must not exceed the total number of resources available in the system | d. must exceed the total number of resources available in the system |  | (1) |
| 9. | For Mutual exclusion to prevail in the system : | | | | C1 |  |
|  | a. at least one resource must be held in a non sharable mode | b. the processor must be a uniprocessor rather than a multiprocessor | c. there must be at least one resource in a sharable mode | d. All of these |  | (1) |
| 10. | Deadlock prevention is a set of methods : | | | | C1 |  |
|  | a. to ensure that at least one of the necessary conditions cannot hold | b. to ensure that all of the necessary conditions do not hold | c. to decide if the requested resources for a process have to be given or not | d. to recover from a deadlock |  | (1) |
| 11. | Physical memory is broken into fixed-sized blocks called \_\_\_\_\_\_\_\_. | | | | C1 |  |
|  | a. frames | b. pages | c. backing store | d. None of the these |  | (1) |
| 12. | The \_\_\_\_\_\_\_\_\_\_ table contains the base address of each page in physical memory. | | | | C1 |  |
|  | a. process | b. memory | c. page | d. frame |  | (1) |
| 13. | \_\_\_\_\_ is the concept in which a process is copied into main memory from the secondary memory according to the requirement. | | | | C2 |  |
|  | a. Paging | b. Demand paging | c. Segmentation | d. Swapping |  | (1) |
| 14. | Which algorithm chooses the page that has not been used for the longest period of time whenever the page required to be replaced? | | | | C3 |  |
|  | a. first in first out algorithm | b. additional reference bit algorithm | c. least recently used algorithm | d. counting based page replacement algorithm |  | (1) |
| 15. | Which of the following page replacement algorithms suffers from Belady’s Anomaly? | | | | C3 |  |
|  | a. Optimal replacement | b. LRU | c. FIFO | d. Both optimal replacement and FIFO |  | (1) |
| 16. | A process refers to 5 pages, A, B, C, D, E in the order : A, B, C, D, A, B, E, A, B, C, D, E. If the page replacement algorithm is FIFO, the number of page transfers with an empty internal store of 3 frames is : | | | | C3 |  |
|  | a. 8 | b. 10 | c. 9 | d. 7 |  | (1) |
| 17. | Optimal page – replacement algorithm is : | | | | C3 |  |
|  | a. Replace the page that has not been used for a long time | b. Replace the page that has been used for a long time | c. Replace the page that will not be used for a long time | d. None of these |  | (1) |
| 18. | Total memory space exists to satisfy a request, but it is not contiguous. It is known as \_\_\_\_\_\_ | | | | C1 |  |
|  | a. External fragmentation | b. Internal Fragmentation | c. Aging | d. Compaction |  | (1) |
| 19. | The two memory access problem in paging can be solved by the use of a special hardware cache called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | | C1 |  |
|  | a. Page table | b. Translation look aside buffer | c. Segmentation table | d. Memory table |  | (1) |
| 20. | The algorithm in which we allocate memory to each process according to its size is known as | | | | C1 |  |
|  | a. proportional allocation algorithm | b. equal allocation algorithm | c. split allocation algorithm | d. None of the mentioned |  | (1) |

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| 21. | \_\_\_\_\_\_\_\_\_ is a program that acts as an intermediary between a user of a computer and the computer hardware. | | | | C1 |  |
|  | a. Application  Program | b. Operating System | c. Software | d. RAM |  | (1) |
| 22. | To access the services of operating system, the interface is provided by the | | | | C1 |  |
|  | a. System calls | b. API | c. Library | d. Assembly  Instructions |  | (1) |
| 23. | A\_\_\_\_\_\_\_ is a software-generated interrupt caused either by an error or a user request. | | | | C1 |  |
|  | a. Bootstrap Program | b. Service Routine | c. Trap | d. Register |  | (1) |
| 24. | Which one of the following error will be handled by the operating system? | | | | C1 |  |
|  | a. Power failure | b. Printer out of  paper | c. Connection  failure in the  network | d. all of the  mentioned |  | (1) |
| 25. | The ability to continue providing service proportional to the level of surviving hardware is called \_\_\_\_\_\_\_\_\_\_\_\_ | | | | C1 |  |
|  | a. Graceful  degradation | b. Fault tolerance | c. Throughput | d. Multitasking |  | (1) |
| 26. | The state of a process is defined by : | | | | C1 |  |
|  | a. the final activity  of the process | b. the activity just  executed by the  process | c. the activity to be  next executed by  the process | d. the current  activity of the  process |  | (1) |
| 27. | \_\_\_\_\_\_\_\_\_\_\_ is a mechanism for controlling the access of processes or users to resources defined by the OS. | | | | C1 |  |
|  | a. Security | b. Protection | c. Defense | d. Caching |  | (1) |
| 28. | Which of the following is not a state of a process? | | | | C1 |  |
|  | a. New | b. Waiting | c. Old | d. Running |  | (1) |
| 29. | A \_\_\_\_\_\_\_\_\_\_\_ system has well defined, fixed time constraints and the processing must be done within the defined constraints or the system will fail. | | | | C1 |  |
|  | a. Real time | b. Distributed | c. Clustered | d. Embedded |  | (1) |
| 30. | The occurrence of an event is usually signaled by | | | | C1 |  |
|  | a. Controller | b. Device driver | c. Interrupt | d. Firmware |  | (1) |
| 31. | \_\_\_\_\_\_\_\_\_\_\_\_\_ system call creates new process in linux. | | | | C1 |  |
|  | a. create process() | b. create() | c. open() | d. fork() |  | (1) |
| 32. | A minimum of \_\_\_\_\_ variable(s) is/are required to be shared between processes to solve the critical section problem. | | | | C1 |  |
|  | a. One | b. Two | c. Three | d. Four |  | (1) |
| 33. | A problem encountered in multitasking when a process is perpetually denied necessary resources is called \_\_\_\_\_\_\_\_\_\_\_\_\_. | | | | C2 |  |
|  | a. Preemption | b. Inversion | c. Deadlock | d. Starvation |  | (1) |
| 34. | Which module gives control of the CPU to the process selected by the short-term scheduler? | | | | C2 |  |
|  | a. Dispatcher | b. Interrupt | c. Scheduler | d. None of the  Mentioned |  | (1) |
| 35. | The signal operation of the semaphore basically works on the basic \_\_\_\_\_\_\_ system call. | | | | C1 |  |
|  | a. start() | b. sleep() | c. wakeup() | d. continue() |  | (1) |
| 36. | The interval from the time of submission of a process to the time of completion is called \_\_\_\_\_\_\_\_\_\_\_\_\_. | | | | C2 |  |
|  | a. Waiting time | b. Throughput | c. Dispatch Latency | d. Turnaround time |  | (1) |
| 37. | In priority scheduling algorithm, when a process arrives at the ready queue, its priority is compared with the priority of \_\_\_\_\_\_\_\_. | | | | C2 |  |
|  | a. Init Process | b. Currently Running  Process | c. All Processes | d. Child Process |  | (1) |
| 38. | The address of the next instruction to be executed by the current process is provided by the | | | | C1 |  |
|  | a. CPU Registers | b. Program Counter | c. Process Stack | d. Pipe |  | (1) |
| 39. | Suppose that a process is in “Blocked” state waiting for some I/O service. When the service is completed, it goes to the \_\_\_\_\_\_\_\_. | | | | C1 |  |
|  | a. New State | b. Running State | c. Ready State | d. Terminated State |  | (1) |
| 40. | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ process spends more time doing computations; few very long CPU bursts. | | | | C2 |  |
|  | a. CPU Bound | b. I/O Bound | c. Memory Bound | d. Independent |  | (1) |

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| **PART B(8 X 5 = 40 MARKS) (ANSWER ANY EIGHT)** | | | |
| 41. | Investigate the necessity for process synchronization. Illustrate a software based peterson’s solution to the critical section problem. | C2 | (5) |
| 42. | Define virtual file system. | C1 | (5) |
| 43. | Examine the issues to be considered in designing multithreaded programs | C2 | (5) |
| 44. | As a process executes it changes state. Discuss the different states of a process and explain about process control block. | C2 | (5) |
| 45. | Write a short note on the common techniques for structuring the page table. | C1 | (5) |
| 46. | Illustrate the significance of resource allocation graph. | C1 | (5) |
| 47. | What is thrashing? How do you prevent it? | C2 | (5) |
| 48. | Explore the details of a modern computer system and illustrate storage and I/O structure. | C1 | (5) |
| 49. | Explain any two directory implementation methods for file system. | C1 | (5) |
| 50. | Define disk scheduling algorithm. | C1 | (5) |
| **PART C( 2 X 10 = 20 MARKS) (ANSWER ANY TWO)** | | | |
| 51. | Consider the following set of processes, with the length of the CPU burst and Arrival time given in milliseconds:  Process Burst Time Arrival Time  P1 10 0  P2 6 1  P3 12 2  P4 15 3   1. Draw Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, preemptive & Non preemptive versions of SJF and Round Robin (time quantum =3) 2. Compute average turn around and waiting time. | C3 | (10) |
| 52. | 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? | C3 | (10) |
| 53. | Consider the following requests are in the disk queue:  98, 183, 37,122, 14, 124, 65, 67  Explain the procedure to provide services for above request sequence with the help of FCFS and SSTF disk scheduling algorithms. ( with proper block diagrams) | C1 | (10) |

ALL THE BEST

\*-unnecessary/extra rows can be deleted

\*-course outcome (CO1,CO2…)should be included

Kindly remove the yellow shaded lines before publishing