FF/2022

19CS51

Reg. No. _____

(2019 Batch onwards)

(To be filled by the candidate)

B.E. DEGREE EXAMINATIONS, FEBRUARY 2022

(Fifth Semester)

COMPUTER SCIENCE AND ENGINEERING

19CS51 UNIX INTERNALS

Time : 3 Hours Max: 75 Marks

INSTRUCTIONS

1. Answer ALL questions in PART A and as per choice in PART B.
2. PART A and PART B questions should be answered separately in the same answer sheet.

PART – A

(10 x 2 = 20 marks)

1. Name the files which are conventionally accessed by a Process.
2. Justify the need for trap instruction.
3. Assume that, a file system inode list starts from block number 2 and there are 16 inodes per block. Compute the block number and the byte offset of the inode number 1028 in the block, if each node occupies 64 bytes and the block size is 1K.
4. State the significance of the file table in the kernel data structure.
5. State the significance of scheduling parameters in a process table.
6. Which are the common detail available in an interrupt vector of a computing machine?
7. Kernel assigns higher priority to a process waiting for locked **buffer** than to a process waiting for locked **inode.** Justify this statement.
8. Assume that, there are 2 groups and each group has 2 and 6 users respectively. Calculate the percentage of CPU time allocated to each group and each user within the group.
9. What are the three stages at which device configuration can be specified?
10. Why inode table count is not reliable while accessing the device in a unix system?

PART – B

(5 X 11= 55 marks)

11. With a neat diagram, describe the architecture of UNIX system. (11)

(OR)

Contd...

12. Consider a kernel where the data is cached in the buffer pool and the block numbers cached in the buffer cache is given as : **11,16,22,39,47,49,55,57,66,68,71,73,75,85,87,110** and **113**. Block number modulo 4 is the hash function used to arrange the buffers in the hash queue. Also assume that the buffers **11,57** and **75** are marked as delayed write. Describe the following scenarios.

a) Show the diagrammatic representation of buffers in the hash queue and the free list elements. (6)

b) Kernel tries to add block number **74**. Which buffer will be replaced for 74? Show the status of buffer cache. (3)

c) Kernel tries to add block number **85.** Show the status of buffer cache. (2)

13. .Compute the desired block number and byte offset within a block for a process, if the process accesses byte offset **52240986** in a file. Assume the block size is fixed as **1024** bytes and block number occupies **4** bytes. Illustrate the steps involved with a diagram. (11)

(OR)

14. Explain how inodes are assigned to a new file. (11)

15. Explain Process state transition with neat diagram. (11)

(OR)

16. Outline how text region is loaded into the primary memory. (11)

17. Three Process A,B and C are created with the following assumptions: (11)
    i) Initial priority as 60 and Highest user level priority is60.
    ii) Clock interrupts the system 70 times a second.
    iii) Process makes no system calls and no process in ready to run.
    Process A and B belong to group I and Process C belongs to group 2. Apply fair share scheduling to calculate the Decay(CPU) and Process Priority along with diagram.

(OR)

18 Explain how swap space is allocated with suitable example. (11)

19. Describe the working of Terminal Driver in a Canonical Mode. (11)

(OR)

20. Explain the common properties shared among messages, shared memory and semaphores. (11)

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