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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

M.Tech Degree S2 (R, S) / S2 (WP) (R) Examination May 2024 (2022 Scheme)

Discipline: COMPUTER SCIENCE AND ENGINEERING

Course Code & Name: 222TCS001 ADVANCED OPERATING SYSTEMS

Max. Marks: 60 Duration: 2.5 Hours

PART A

Answer all questions. Each question carries 5 marks Marks

1 Explain the real-time scheduling policies supported by the Linux kernel. (5)

2 How are system calls implemented in Linux? (5)

3 Differentiate between pseudo-concurrency and true-concurrency and summarize its different causes. (5)

4 Substantiate the importance of memory zones in Linux and write the classification of zones. (5)

5 Describe the anatomy of block devices and how block devices differ from character devices? (5)

PART B

Answer any 5 questions. Each question carries 7 marks

6 **a)** Which are the different data structures used by the Linux scheduler. Summarize their roles. (4)

b) During process creation, the Linux kernel runs the child process first. Justify the reason. (3)

7 Illustrate how time accounting, process selection, scheduler entry point and sleeping and waking up is implemented in the Linux Completely Fair Scheduler (CFS). (7)

8 Why do kernel interrupt handlers implement bottom halves? Describe any two bottom-half mechanisms supported by the Linux Kernel? (7)

9 a) What are atomic integer operations? Give two examples of atomic integer operations. (3)

b) Illustrate race condition and critical section with an example code snippet. (4)

10 Narrate the relation between slab, caches and object and explain design of the slab layer in Linux. (7)

11 Explain the concept of high memory mapping and per CPU allocations in Linux. (7)

12 Explain how Linus Elevator algorithm works for I/O scheduling. (7)

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