27/02/23

Indian Institute of Engineering Science and Technology, Shibpur

B. Tech. (CST) 6^{th} Semester Mid-Term Examination, February, 2023

Operating Systems (CS 3201)

Full Marks: 30 Time: 2 Hours

- Attempt any three (3) questions.
- Answers should be precise, to the point, and in your own words as far as practicable.
- Make your own assumptions, if necessary, and state them at proper places.

1. (a) Explain with suitable example(s) the motivation(s) behind the creation of "**process**" abstraction in a multiprogramming and multitasking Operating System.
   (b) What are the activities involved when the Operating System is putting one process from "**Running**" state to "**Ready**" state?
   (c) What are the process related system calls in Linux (Unix) Operating System and what do they do? [4+3+3]
2. (a) How does **Virtual Memory** facilitate implementation of Shared Memory Segments (in the context of Inter Process Communication)?
   (b) Explain how protection over different resources in Linux (Unix) Operating System is achieved in terms of UGO (User, Group, Others) and RWX (Read, Write, Execute)! [5+5]
3. (a) What are the process synchronization scenarios that you can conceive, and how to realize them in a Linux (Unix) Operating System?
   (b) Other than CPU and Main memory, what are the **Hardware Supports** needed for implementation of Virtual Memory? Explain their roles! [5+5]
4. Write short notes on the following.
   (a) File Related System Calls in Linux (Unix) Operating System and their usage.
   (b) Page Table (in the context of Memory Management). [5+5]