COMPUTER SCIENCE TRIPOS Part IA – 2026 – Paper 2

3 Operating Systems (mk428)

(*a*) What is the purpose of Inter-Process Communication (IPC)? What are the differences between pipes and shared memory for IPC, including their pros and cons? [6 marks]

(*b*) Suggest two ways how one Linux process can notify another process that something has happened. Explain briefly how they differ. [2 marks]

(*c*) What other reasons besides shared memory IPC are there for sharing memory pages between multiple processes? How does the operating system enforce memory protection for these various types of sharing? [6 marks]

(*d*) Your colleague wants to store a linked list within a shared memory segment. Suggest some issues that are likely to arise. [3 marks]

(*e*) Another colleague of yours wants to use a fixed-length file on a solid state drive (SSD) as a way to support IPC between processes. Like with shared memory, processes can read and write to arbitrary locations within this file. If the disk is shared between different machines, this could even support IPC across machines. Is this a good idea? Justify your answer. [3 marks]