

PART B — (5 × 16 = 80 marks)

11. (a) (i) Define operating system. Explain the main functions of an operating system. (8)
- (ii) Describe the essential properties for the multiprocessor and real-time operating systems. (8)

Or

- (b) (i) Describe the inter process communication in client-server systems. (8)
- (ii) Explain the issues in threading. (8)
12. (a) (i) Differentiate preemptive scheduling from non-preemptive scheduling. (4)
- (ii) Explain FCFS, SJF, non-preemptive priority and RR (time slice = 3) scheduling algorithms by considering five processes with burst time and priority. Compare the turnaround and waiting times of each process for each of the above scheduling algorithms. (12)

Or

- (b) (i) Define semaphore. Explain the use of semaphores in synchronization problem with an example. (6)
- (ii) What is deadlock? How deadlock can be avoided using Banker's algorithm. Explain with an illustration. (10)
13. (a) (i) Explain how virtual address is mapped to physical address in paging, with the hardware support required. (8)
- (ii) Define thrashing. Explain the cause for thrashing. (4)
- (iii) What is meant by Belady's anomaly? Briefly explain with an example. (4)

Or

- (b) Explain the various page replacement algorithms with an example reference string. Mention their merits and demerits. (16)
14. (a) (i) List and explain the three common ways by which files can be structured. (6)
- (ii) Explain Linux file system in detail. (10)

Or

- (b) (i) What is the role of Access matrix for protection? Explain. (6)
- (ii) Explain Windows XP file system in detail. (10)

15. (a) Assume the head of a moving disk with 200 tracks, numbered 0...199, is currently serving a request at track 92, and has just finished a request at track 85 and the queue request is kept in the FIFO order, 109, 148, 89, 72, 126 and 142. What is the total head movement needed to satisfy these requests for the SCAN, C-SCAN, LOOK and C-LOOK disk scheduling algorithms? (16)

Or

- (b) (i) Explain the RAID. (6)
(ii) Define swapping. Describe how swap space is managed by an operating system. (10)