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(February)

COMPUTER APPLICATION

(Honours)

(Operating System and Introduction to LINUX)

(BCA-303)

Marks : 45

Time : 2 hours

*The figures in the margin indicate full marks
for the questions*

Answer **one** question from each Unit

UNIT—I

1. (a) What is the difference between timesharing and multiprogramming? 5
(b) What is the purpose of system call in an operating system? 4
2. (a) Discuss briefly the different types of mobile operating system. 5
(b) Distinguish between distributed and parallel systems. 4

UNIT—II

3. (a) Discuss the process model and the concept of implementation of processes. 5
(b) Discuss inter-process communication with examples. 4
4. (a) What are the different goals of scheduling algorithm? 3
(b) Five batch jobs A through E, arrive at a computer center at almost the same time. They have estimated running times of 10, 6, 2, 4 and 8 minutes. Their (externally determined) priorities are 3, 5, 2, 1 and 4, respectively, with 5 being the highest priority. For each of the following scheduling algorithms, determine the mean process turnaround time. Ignore process switching overhead :
- (i) Round robin
(ii) Priority scheduling
(iii) First-come, first-served (run in order 10, 6, 2, 4, 8)
(iv) Shortest job first
- For (i), assume that the system is multiprogrammed, and that each job

(3)

gets its fair share of the CPU. For (ii) through (iv), assume that only one job at a time runs, until it finishes. All jobs are completely CPU bound. 6

UNIT—III

5. (a) What are semaphores? Explain how it can be used to implement mutual exclusion. 2+3=5
(b) Explain the terms 'critical section' and 'mutual exclusion'. 2+2=4
6. (a) Explain the readers/writers problem. 5
(b) Explain two-process solution with example. 4

UNIT—IV

7. (a) What is demand paging? Explain. 5
(b) What is thrashing? What are the causes for thrashing? Explain the term 'locality of reference' and elaborate on its usefulness in preventing thrashing. 1+1+2=4
8. (a) What is fragmentation? Explain its types. 2+2=4
(b) Consider the page reference string 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. Find out the number

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of page faults if there are 4 page frames, using the following page replacement algorithm : 2+2+1=5

- (i) LRU
(ii) FIFO
(iii) Optimal

UNIT—V

9. (a) Describe briefly the UNIX architecture. 5
(b) The length and breadth of a rectangle and radius of a circle are input through the keyboard. Write a script to calculate the area and perimeter of the rectangle as well as the area and circumference of the circle. 4
10. (a) Write the purpose of the following commands : 1×3=3
(i) who
(ii) pwd
(iii) grep
(b) Explain the three modes of the vi editor. 3
(c) Explain file permissions. 3
