

Roll No.

BCA-402(N)

B. C. A. (Fourth Semester)
EXAMINATION, May, 2013

(New Course)

Paper Second

OPERATING SYSTEM

Time : Three Hours]

[Maximum Marks : 75

Note : Section A is compulsory. Attempt any *seven* questions from Section B and *one* question from Section C.

Section – A

1. Consider the following snapshot of a system : 6

| Process | Allocation | | | | Max | | | | Available | | | |
|----------------|------------|---|---|---|-----|---|---|---|-----------|---|---|---|
| | A | B | C | D | A | B | C | D | A | B | C | D |
| P ₀ | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 1 | 5 | 2 | 0 |
| P ₁ | 1 | 0 | 0 | 0 | 1 | 7 | 5 | 0 | | | | |
| P ₂ | 1 | 3 | 5 | 4 | 2 | 3 | 5 | 6 | | | | |
| P ₃ | 0 | 6 | 3 | 2 | 0 | 6 | 5 | 2 | | | | |
| P ₄ | 0 | 0 | 1 | 4 | 0 | 6 | 5 | 6 | | | | |

Answer the following questions using the Banker's algorithm :

- What is the content of the Matrix need ?
- Is the system in a safe state ?

P. T. O.

- (iii) If a request from process P_1 arrives for (0, 4, 2, 0), can the request be granted immediately ?
2. (i) What are overlays ? In what circumstances is overlay useful ? 2
- (ii) Differentiate the logical and physical address with an example. 2
- (iii) What is a process control block ? Draw it. 2
- (iv) What is meant by 'interleaving' of disk blocks ? 2
- (v) Draw a process state diagram showing various possible states of a process and possible transition from one state to another. 2
- (vi) Given memory partition of 100 KB, 500 KB, 200 KB 300 KB and 600 KB (in order). How would each of First-Fit, Best fit and Worst fit algorithm place processes of 212 KB, 417 KB, 112 KB and 426 KB ? Which algorithm makes the most efficient use of memory ? 2

Section - B

6 each

3. If the reference string is 1, 2, 3, 4, 5, 3, 2, 5, 4, 1, 5 and the maximum numbers of pages which can be stored at a time in memory is 3 then calculate the number of page faults when LRU (least recently used) page replacement algorithm and FIFO page replacement algorithm is used.
4. Name the various file access methods. Explain each in detail.
5. Four processes P_1, P_2, P_3, P_4 arrive in a system at times 0.0, 0.6, 1.0, 12.0 and their estimated execution times are 8, 4, 1 and 4 units respectively. Calculate average turn

around time and waiting time for SJF scheduling and SRTF scheduling.

6. Explain multilevel feedback queue algorithm for CPU scheduling. What are its drawbacks as compared to Round Robin algorithm ?
7. Explain Resource-Request algorithm for deadlock avoidance with example.
8. What are the main criteria used for comparing the CPU scheduling algorithm ? Explain.
9. Differentiate clearly between (min 2 points) :
 - (i) Job scheduler and CPU scheduler
 - (ii) Multi-user OS and Network OS
 - (iii) Short-term scheduler and medium term scheduler
10. What is meant by 'Synchronization' between two processes ? How can you achieve the synchronization using the semaphores ? Explain.
11. What is meant by 'Compaction' of disk ? Why is it required to be done ?
12. Differentiate clearly between Deadlock Avoidance and Prevention. Which one is generally preferred ? Why ?

Section – C

15 each

13. Suppose that head of moving head disk with 200 tracks numbered 0 to 199 is currently serving a request at 50 track and has just finished a request at track 85. If the queue of request is kept in FIFO order

100, 199, 56, 150, 25, 155, 70, 85

P. T. O.

[4]

A seek takes 6 m sec. per cylinder moved. How much seek time is needed for the following :

- (i) FCFS
- (ii) SSTF
- (iii) SCAN
- (iv) LOOK
- (v) C-LOOK

14. Write short notes on any *five* of the following :

- (a) System calls
- (b) Fragmentation
- (c) Threads
- (d) Multiprocessor system
- (e) Contiguous memory allocation
- (f) Demand paging