# Paper Code : 21316

## F–416

## B. C. A. (Fourth Semester)
## EXAMINATION, 2019

### (New Course)

Paper No. BCA–N–401

OPERATING SYSTEM

*Time : Three Hours* ] [ *Maximum Marks : 70*

**Note :** Attempt any *five* questions. All questions carry equal marks.

1. (a) Explain operating system architecture.

   (b) Discuss the similarities and differences between paging and segmentation.

   (c) Compare and contrast multitasking and multiprogramming.

2. (a) Describe the differences among short-term, medium-term and long-term scheduler.

   (b) Explain the term process. What are the various states that a process can undergo ? Also explain PCB with a neat diagram.





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3. (a) With a neat diagram explain Resource Allocation Graph.

   (b) What is deadlock ? Explain the necessary conditions for its occurrence.

4. (a) Let a disk drive has 5000 cylinders from 0 to 4999. Currently drive is at 143rd cylinder, and the previous request was at cylinder 125. Queue of pending request FIFO order 186, 1470, 913, 1774, 948, 1509, 1022, 130. What is total distance the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms from current position ?

   (i) FCFS

   (ii) SCAN

   (iii) LOOK

   (b) What are semaphores ? Explain binary and counting semaphores with an example.

5. (a) Explain with the help of supporting diagram Transition Lead aside Buffers (TLB) improves the performance of demand paging.

   (b) Consider the following reference string 7, 0, 1, 2, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 01 for a memory with three (03) frames. How many page faults access for LRU and FIFO page replacement algorithms ? Which is efficient among both ?



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6. (a) For the following snapshot, find the safe sequence using Banker's algorithm :

| | Allocation | | | Max | | | Available | | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | A | B | C | A | B | C |
| $P_0$ | 0 | 0 | 2 | 0 | 0 | 4 | 1 | 0 | 2 |
| $P_1$ | 1 | 0 | 0 | 2 | 0 | 1 | | | |
| $P_2$ | 1 | 3 | 5 | 1 | 3 | 7 | | | |
| $P_3$ | 6 | 3 | 2 | 8 | 4 | 2 | | | |
| $P_4$ | 1 | 4 | 3 | 1 | 5 | 7 | | | |

(i) Is the system in safe state ?

(ii) If a request from process $P_2$ arrives for (002), can the request be granted immediately ?

(b) Given the memory partitions of 100 k, 500 k, 200 k, 300 k and 600 k apply first fit and last fit algorithm to place 212 k, 417 k, 112 k, 426 k.

7. (a) What is a file ? Explain the different file allocation methods.

(b) What are directories ? List the different directory structures with examples. Mention their advantages and disadvantages.