16. Consider the following snap shot of a system:

Process	Allocation	Need	Available
	A B C D	A B C D	A B C D
P_1	1 4 2 0	0 3 3 0	1 1 1 2
P_2	1 3 5 4	1 0 0 2	
P_3	0 6 3 2	0 0 2 0	
P_4	0 0 1 4	0 6 4 2	

Answer the following question using the Banker's algorithm-

(i) What is the content of the matrix need?

(ii) Is the system in a safe state?

(iii) If a request from process P, arrives for (0,0,1,2), can the request be granted immediately.

17. Write short notes on the following-

(a) File allocation methods

(b) Disk Scheduling

(c) Deadlock Avoidance

(d) Demand paging

(e) Swapping

(f) Disk structure

Roll No.....

BCA-402(N)

B.C.A. (Semester-IV) Examination-2014
(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 attempt any one question from Section C.

Section-A

Note: All questions are compulsory. Each question carries 3 marks. (3x6=18)

1. Write the three main purpose of an operating system.
2. What is the purpose of system calls?
3. Write and explain data structures name of banker's algorithm.
4. Explain Directory structure.
5. Explain any one of classical problems of synchronization.
6. Write safe and unsafe state.

Section-B
(Short Answer Type Questions)

Note: Attempt any seven questions. Each question carries 6 marks. (7x6=42)

7. What are the main criteria used for comparing the CPU scheduling algorithm? Explain.

8. What is meant by a non-shareable resource? Explain clearly.

9. A disk has 19, 456 cylinders, 16 heads and 63 sectors per track. The disk spins at 5400 rpm. Seek time between adjacent tracks is 2 μs . Assuming the read/write head is already positioned at track 0, how long does it take to read the entire disk?

10. Given a system with four page frames, the following table indicates page, load time, last reference time, dirty bit and reference bit.

Page	Load time	Last reference	Dirt bit	Reference bit
0	167	374	1	1
1	321	321	0	0
2	254	306	1	0
3	154	331	0	1

(i) Which page will FIFO replace?
(ii) Which page will LRU replace?

11. Differentiate clearly between-
(i) Logical address and physical address
(ii) Multitasking and multiuser operating system

12. Four processes P_1, P_2, P_3, P_4 arrive in a system at lines 0,3,4,5 and their estimated execution lines are 8,4,3,3 units respectively. Calculate average turnaround time and waiting time for SRTF, Round Robin scheduling (time quantum = 2μs).

13. Name the various page replacement algorithms and explain any one of them in detail.

14. If the reference string is 1,2,3,4,5,3,2,5,4,1,5 and the maximum number of pages which can be stored at a time in memory is 3 then calculate the number of page fault when LRU algorithm is used.

15. Explain Dining philosopher's problem.

Section-C
(Long Answer Type Questions)

Note: Attempt any one question. Each question carries 15 marks. (15x1=15)