BCA–402(N)

B. C. A. (Fourth Semester)
EXAMINATION, May/June, 2015

(New Course)

Paper Second

OPERATING SYSTEM

Time : Three Hours]   [*Maximum Marks : 75*

Note : Attempt questions from all Sections as directed.

Section—A   3 each

(Short Answer Type Questions)

Note : All questions are compulsory.

1. (A) What are the advantages of multiprogramming and time sharing operating system ?

 (B) What is system call in the context of operating system ?

 (C) What is process ? What causes process change one state to other ? Show schematically.

 (D) Discuss virtual memory.

 (E) What are various types of CPU schedulers ? Describe

 (F) Explain pre-emptive and non-pre-emptive scheduling.

(G) What is process synchronization ? Show with the example of Bounded buffer problem.

(H) What is device management ?

(I) Describe resource allocation graph with multiple instance of resources with a suitable example.

Section—B

12 each

(Long Answer Type Questions)

Note : Attempt any *two* questions.

2. (a) Describe demand paging with its advantages and disadvantages.

   (b) Why page replacement is needed ? Describe.

3. Suppose reference strings are as given below :

   1, 2, 4, 3, 6, 7, 2, 3, 4, 3, 1, 3, 4

   (a) Explain FIFO replacement with 4 frames.

   (b) Explain LRU with 4 frames.

4. For the following situation find average waiting time and average turn around time for :

   (a) Pre-emptive SJF scheduling

   (b) Pre-emptive Priority scheduling

Process	Burst time (ms)	Priority	Arrival
P₁	10	3	1
P₂	1	1	2
P₃	2	4	3
P₄	1	5	4

5. (a) What is deadlock ? List *four* necessary conditions for occurrence of deadlock.

   (b) Compare deadlock prevention and deadlock avoidance.

Section—C

12 each

(Long Answer Type Questions)

Note : Attempt any *two* questions.

6. Describe bankers algorithm for safe allocation. Consider the system with the following snapshot of a system :

Process	Allocation				Maximum				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P₀	0	0	1	2	0	0	1	2	1	5	2	0
P₁	1	0	0	0	1	7	5	0				
P₂	1	3	5	4	2	3	5	6				
P₃	0	6	3	2	0	6	5	2				
P₄	0	0	1	4	0	6	5	6				

   (a) What is the content of Need matrix ?

   (b) Is the system in safe state ?

   (c) If a request from P₁ arrives for (0, 4, 2, 0), can the request be granted immediately ?

7. What is spooling ? Describe the following disk scheduling diagrammatically for a disk queue with request for I/O to block on cylinder in the order :

   95, 170, 37, 120, 14, 180, 65, 69

   (a) For FCFS

   (b) SSTF

8. (a) Discuss sequentially and Indexed sequential file organization methods.

   (b) Discuss sequential access and direct access methods of file managment.

9. (a) Discuss different file allocation methods.

   (b) Discuss Disk (Secondary storage structure in detail). What is seek time and latency time ?