Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/BCA/SEM-3/BCA-301/2013-14
2013
OPERATING SYSTEMS

Time Allotted : 3 Hours   Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words
as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

    i)   A process has finished its execution when it is in .... state.

        a)   running   b)   blocked

        c)   ready   d)   terminated.

    ii) The technique of temporarily removing inactive programs from the memory of a computer system is

        a)   Switching   b)   Swapping

        c)   Paging   d)   None of these.

    iii) The time required for read-write head to target cylinder is called

        a)   Latency time   b)   Seek time

        c)   Transfer time   d)   None of these.

    iv) The technique of relocating all occupied areas of storage to one end is called

        a)   Sharing   b)   Relocation

        c)   Compaction   d)   Distribution.

3025   [Turn over

CS/BCA/SEM-3/BCA-301/2013-14

v) The application of linked list results in

   a) Contiguous allocation of memory

   b) Non-contiguous allocation of memory

   c) Internal fragmentation of memory

   d) External fragmentation of memory.

vi) Which of the following statements if *false* ?

   a) Implicit task is a system-defined task

   b) A process is an instance of a program execution

   c) Buffering is a sophisticated form of Spooling

   d) Time-sharing system follows Round-robin algorithm.

vii) Short replicating programs that uses time of the CPU unnecessarily is a

   a) Worm   b) Virus

   c) Distributed Process   d) Trojan Horse.

viii) The coincidence of high page traffic and low CPU utilization is

   a) Belady's anomaly   b) Mutual exclusion

   c) Deadlock   d) Thrashing.

ix) The data structure that maps each page frame with the physical memory is

   a) Page-map table   b) Memory-map table

   c) Stack   d) Queue.

x) The technique of dividing the address space of a process to place them into non-contiguous areas of memory is called

   a) Paging

   b) Segmentation

   c) Translation through TLB

   d) Defragmentation.

CS/BCA/SEM-3/BCA-301/2013-14

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. a) When does a page-fault occur ? 2

   b) Describe the action taken by the operating system when a page fault occurs. 3

3. Explain PCB with a neat diagram.

4. Explain with examples the difference between preemptive and non-preemptive priority scheduling.

5. Explain the demand paging in memory management scheme.

6. Distinguish between 'starvation' and 'deadlock'.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Explain the difference between process and program. Briefly discuss about process creation and termination.

   b) Consider the following set of processes. CPU Burst time of them are given below in millisecond and priority of each processes are given :

Process	CPU Burst Time	Priority
P1	10	3
P2	1	1
P3	2	2
P4	1	5

Draw the Gantt chart for priority scheduling. Calculate the average waiting time also. 3 + 7 + 5

CS/BCA/SEM-3/BCA-301/2013-14

8. a) What is critical section problem ? What are the requirements that the solution to critical section problem must satisfy ?

    b) What is Semaphore ? How is it accessed ? Explain the Dining Philosopher's problem and give the solution of it, using monitor. 5 + 10

9. a) What is deadlock ? Write down necessary conditions for deadlock ?

    b) Determine whether the processes are in safe state or unsafe state :

Process	Resources Allocated	Max. requirement of resources	Max. resources Requested
A	4	14	10
B	5	8	3
C	3	7	4

    Total No. of available resources in the system is 15.

    5 + 10

10. a) Explain Mutual exclusion.

    b) Write the first algorithm of mutual exclusion algorithm.

    c) What are its problems ? 5 + 5 + 5

11. Write short note on any *three* of the following : 3 × 5

    a) Priority scheduling

    b) Thrashing

    c) Virtual memory

    d) Paging and Segmentation.