Registration No. :

Total number of printed pages – 3

Sixth Semester Regular Examination – 2015

OPERATING SYSTEM

BRANCH (S) : AEIE, BIOMED, EEE, ELECTRICAL, IEE, MME
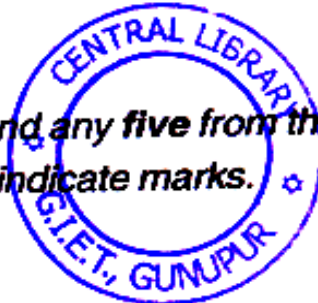
QUESTION CODE : J 486

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory and any five from the rest.
The figures in the right-hand margin indicate marks.

1. Answer the following questions :   2×10

    (a) Differentiate between time sharing system and real time system. Mention at least one example of each.

    (b) What is the function of system calls ? Write different types of system calls.

    (c) Mention the scenarios for which cancellation of thread may occur.

    (d) Define race condition. How can you guard against race condition ?

    (e) Write the differences between deadlock and starvation.

    (f) If a logical address space has four pages of 516 words each and physical memory has 16 frames, determine the size of logical address and physical address.

    (g) What is Belady's anomaly ?

    (h) Mention the advantages of two-level-directory structure over one-level-directory.

    (i) Write the function of boot control block and partition control block.

    (j) What is bit vector ? Mention its importance by taking an example.

2. Consider the following set of processes, with the length of CPU-burst time given in milliseconds: **10**

Process	Burst time	Priority
P_1	5	2
P_2	10	4 (Low)
P_3	3	2
P_4	4	3
P_5	1	1 (High)

The processes are assumed to have arrived in the order P_1, P_2, P_3, P_4, P_5 all at time 0.

(a) Draw the Gantt charts illustrating the execution of these processes using FCFS, SJF, priority scheduling and round robin scheduling with a time quantum = 4 millisecond.

(b) Find out the turn around time and waiting time of each process for each scheduling algorithm.

(c) Which algorithm would give the minimum average waiting time ?

3. What is critical section problem ? Mention the requirements that must be satisfied for solving this problem. Define Readers-Writers problem. Suggest a solution to this problem. **10**

4. (a) Explain the deadlock avoidance algorithm by taking a suitable example. **5**

   (b) What is virtual memory ? How can you implement it ? **5**

5. (a) Consider the following page reference string.

   1,2,3,4, 1,5, 4, 3, 2, 1,4,3

   Find out the number of page faults that would occur for LRU algorithm. Assume there three frames and initially all are empty. **5**

   (b) Discuss the different techniques for structuring the page table. **5**

6. (a) Compare the relative advantages and disadvantages of various file access methods. 5

(b) Explain various methods to allocate space to files in an efficient manner. 5

7. Write the importance of disk scheduling. Compare the working the SSTF scheduling and SCAN scheduling. 10

8. Write short notes on any **two** : 5 × 2

(a) Multithreading Models.

(b) Monitors.

(c) Deadlock Detection.

(d) Swap-Space Management.