

D-180596**B. Tech. EXAMINATION, 2018**

Semester IV (CBS)

OPERATING SYSTEM (CSE, IT)

CS-402

Time : 3 Hours

Maximum Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt Five questions in all, selecting one question from each Sections A, B, C and D. Section E is compulsory.

Section A

1. (a) What is Multiprogramming ? Explain how multiprogramming increases the utilization of CPU. 5
- (b) What is a scheduler ? List and describe different types of schedulers. 5

2. (a) What is an Operating System ? Why is the operating system viewed as a resource allocator and control program ? 5
- (b) Describe the features of a distributed operating system. 5

Section B

3. (a) What do you mean by PCB ? Where is it used ? What are its contents ? Explain.
 - (b) What do you mean by binary semaphore and counting semaphore ? With C structure, explain implementing of wait() and signal. 5
 4. Consider the following five processes, with the length of the CPU burst time given in milliseconds : 10
- | | | | | | | |
|------------|---|----|----|----|----|----|
| Process | : | P1 | P2 | P3 | P4 | P5 |
| Burst Time | : | 10 | 29 | 3 | 7 | 12 |
- Consider the First Come First Serve (FCFS), Non-Preemptive Shortest Job First (SJF), Round Robin (RR) (Quantum = 10 ms) scheduling algorithms. Illustrate the scheduling using Gant chart. Which algorithm will give the minimum average waiting time ? Discuss. 10

Section C

5. Consider the following page reference string : 10

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

How many page faults would occur for the following replacement algorithms, assuming three frames that all frames are initially empty ?

- (i) FIFO
- (ii) Optimal Replacement
- (iii) LRU.

6. What is Virtual Memory ? Explain how paging supports virtual memory. With neat diagram, explain how logical address is translated into physical address ? <https://www.hptuonline.com> 10

Section D

7. Explain in detail the design principles, kernel modules, process management, scheduling in LINUX system. 10
8. What is Virtualization ? Give the procedure for setting VMware on LINUX host and adding guest OS. 10

Section E

9. Answer the following questions : 10×2=20

- (a) List the services provided by an Operating System.

- (b) Define the term File. List various attributes of a file.
- (c) What is meant by Process ?
- (d) What are the advantages of distributed systems ?
- (e) Differentiate between Logical and Physical address space.
- (f) Write various goals of Security.
- (g) Explain the term Waiting time and Turnaround time.
- (h) Explain in brief about process synchronization.
- (i) What is meant by Buffer Cache ?
- (j) What is meant by Boot Disk ?