18061(M)

B. Tech 4th Semester Examination

Operating System (CBS)

CS-402

Time : 3 Hours   **Max. 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 each from section A, B, C, and D. Section E is compulsory. Use of non-programmable calculators is allowed. Substantiate your answers with suitable examples wherever required.

SECTION - A

1. (a) Explain the layered architecture of operating system. Also draw the diagram. (6)

   (b) What is the main advantage of the layered approach to system design? What are the disadvantages? (6)

2. (a) Explain how virtual machine works to achieve efficiency for applications and OSes executing non-privileged instructions. When is emulation overhead introduced, and how significant is it? (6)

   (b) Compare and contrast multitasking and multiprocessing environment. (6)

SECTION - B

3. What is a process? List any 6 of the attributes that an operating system maintains to keep track of information about a process. Why the scheduling of processes and threads on a multi-processor system is more complicated than scheduling them on a uni-processor system. (12)

4. (a) Differentiate between pre-emptive and non-pre-emptive scheduling. (6)

   (b) What is semaphore? Explain counting semaphore. What are the disadvantages of using semaphores? (6)

SECTION - C

5. (a) Explain the following:

   (i) FIFO Page replacement algorithm.

   (ii) LRU Page replacement algorithm. (6)

   (b) Explain the concept of segmentation taking suitable examples. https://www.hptuonline.com (6)

6. (a) Describe the different techniques with which a file can be shared among different users. (6)

   (b) Differentiate between protection and security. Explain the techniques used for protection of user files. (6)

SECTION - D

7. (a) What is the difference between deadlock prevention and deadlock avoidance? What category does Bankers algorithm falls in and why? (6)

   (b) What are the security issues in an Operating System? (6)

8. (a) Define deadlock. Discuss the merits/demerits of two ways in which the operating system can recover from a deadlock. (6)

   (b) Describe the salient characteristics of Linux operating system. (6)

SECTION - E

9. Write short notes on:

   (a) Real time systems.

   (b) Virtual memory.

   (c) Swap space management.

   (d) Security policies. (3×4=12)