15116

3 Hours / 100 Marks   Seat No.

Instructions : (1) All Questions are *compulsory*.

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. **(A) Attempt any THREE of the following :** **12**

   (a) List different types of operating systems. Explain advantages of multiprocessor system (any two).

   (b) Define multiprogramming system with diagram.

   (c) Draw and explain monolithic structure of operating system.

   (d) Explain two level directory structure with the help of diagram.

   (B) Attempt any ONE of the following : **6**

   (a) Explain any six services provided operating system. Draw diagram showing services.

   (b) Draw and explain contiguous method for access.

2. **Attempt any FOUR of the following :** **16**

   (a) What is clustered system ? Explain it.

   (b) Draw and explain process state diagram.

   (c) Define preemptive and non-preemptive scheduling with suitable example.

   (d) What is virtual memory ? Explain paging and page fault.

   (e) Explain the structure of UNIX.

   (f) Compare UNIX and LINUX w.r.t. following points :

   User interface, number of shells, providers, processing speed.

P.T.O.

3. **Attempt any FOUR of the following :** **16**

   (a) Describe any four activities of process management and memory management.

   (b) Explain interprocess communication.

   (c) Write steps for Banker's algorithm to avoid deadlock.

   (d) State necessary condition for deadlock.

   (e) List different types of files. Explain basic operations on file.

4. (A) **Attempt any THREE of the following :** **12**

   (a) List any four system calls for device management and communication.

   (b) Describe any four secondary storage management activities.

   (c) What is thread ? Explain users and Kernel threads.

   (d) State and describe types of schedules. Describe how each of them schedule the job.

   (B) **Attempt any ONE of the following :** **6**

   (a) What is process ? Explain the different process states with diagram.

   (b) With suitable diagram, explain how linked allocation is performed.

5. **Attempt any TWO of the following :** **16**

   (a) Describe many to one and one to many multithreading model with diagram. Explain advantages of each (any two).

   (b) Calculate average waiting time for FCFS and SJF for following table :

Process	Arrival time	Burst time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

   (c) Explain how UNIX is differ from LINUX w.r.t. architecture, applications, case of operation and system requirement.

6. **Attempt any FOUR of the following :** **16**

    (a)   What is real time system ? Explain its types.

    (b)   What is system call ? Explain open( ) system call and close( ) system call.

    (c)   Explain the concept of context switching.

    (d)   Differentiate between paging and segmentation.

    (e)   Explain booting system of UNIX.

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