

(2½ Hours)

[Total Marks: 75]

- N. B.: (1) **All** questions are **compulsory**.
 (2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
 (3) Answers to the **same question** must be **written together**.
 (4) Numbers to the **right** indicate **marks**.
 (5) Draw **neat labeled diagrams** wherever **necessary**.
 (6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt any three of the following:

15

- What is Operating System? Explain the role of operating system as extended machine.
- Write a short note on Fifth Generation of Operating System.
- Explain multithreaded and multi-core chips.
- Using suitable diagram explain the structure of disk drive.
- Write a short note on Process Model.
- Explain the dining philosopher's problem.

2. Attempt any three of the following:

15

- Explain the concept of running multiple programs without memory abstraction.
- How swapping helps to hold large programs in RAM? Explain Using suitable diagram.
- Explain Clock page replacement algorithm using suitable example.
- List and explain any five operations performed on Files.
- Explain the Unix V 7 File system.
- List and explain any five operations performed on Directories.

3. Attempt any three of the following:

15

- What are block devices and character devices? Explain.
- Write a short note on Memory Mapped IO.
- Explain Direct Memory Access using suitable diagram.
- Explain preemptable and non-preemptable resources.
- List Coffman's four conditions that must hold for a resource to be in deadlock.
- Explain the process of Deadlock Detection with One Resource of Each Type.

4. Attempt any three of the following:

15

- Write a note on Type-1 and Type-2 Hypervisor.
- Explain any five advantages of virtualization.
- List and explain five essential characteristics of Cloud.
- Write a note on Virtual Machine Migration.
- What is Master-Slave Multiprocessors Operating System?
- List the different Multicomputer Interconnection Technologies. Explain any two.

5. Attempt any three of the following:

15

- Explain the kernel structure of Linux.
- List and explain any five file-system related system calls in Linux.
- Using suitable diagram explain the architecture of Android Operating System.
- Explain the programming layers in modern windows operating System.
- Explain the booting process of windows OS.
- Write a note on windows power management.
