Q.P. Code : 750301

(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 labelled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**

1. Attempt *any three* of the following:
a. Explain third generation operating systems.
b. List and explain system calls for process management.
c. Explain client-server model
d. Explain the dining philosopher's problem.
e. Explain round robin scheduling. give proper example.
f. Write a short note on semaphores.

2. Attempt *any three* of the following: **15**
a. Explain with example the second chance page replacement algorithm.
b. Explain swapping.
c. Write a short note on segmentation.
d. List and explain different file attributes.
e. List various ways of implementing files. Explain any one in detail.
f. Explain disk quotas.

3. Attempt *any three* of the following: **15**
a. Write a short note on direct memory access.
b. Explain programmed I/O.
c. List different I/O software layers. Explain any two of them.
d. What is deadlock? List and explain conditions that are necessary for a resource deadlock to occur.
e. Explain deadlock detection algorithm to detect deadlock when multiple resources of each type are available.
f. How are deadlocks prevented? Explain.

4. Attempt *any three* of the following: **15**
a. Write the advantages of virtualization.
b. With neat diagram explain type 1 and type 2 hypervisor.
c. What is cloud? Write the essential characteristics of cloud.
d. List different types of multiprocessor operating systems. Explain any two.
e. With neat diagram explain various interconnection technologies used in multicomputer.
f. Write a short note on remote procedure call.

5. Attempt *any three* of the following: **15**
a. Explain the kernel structure of Linux.
b. Explain Android architecture.
c. List and explain file-system system calls in Linux.
d. Write down I/O and object manager steps for creating/opening a file and getting back a file handle.
e. List Win32 calls for managing processes, threads and fibres.
f. List and explain attributes used in MFT records.
