Note :—   1) Diagrams should be neat and labeled.
           2) All questions are compulsory.
           3) Figures to the right indicate marks.

Q. 1   Answer the following. (Any two)   10
a) Explain Batch processing operating system?
b) Define operating system with its list of classes?
c) Write a short note on cluster operating system?
d) Write a short note on Assembler?

Q. 2   Answer the following. (Any two)   10
a) Explain types of user-Interface for operating system?
b) Write short note on virtual machine with its example?
c) Explain various types of system calls?
d) Write a short note on operating system generation?

Q. 3   Answer the following. (Any two)   10
a) Define process and process state in detail?
b) Calculate average waiting time according to non-pre emptive SJF scheduling algorithm
   for :

Process	Burst time
P_1	7
P_2	6
P_3	8
P_3	3

c) Explain different multi-threading models.
d) Explain the concept of semaphores.

Q. 4   Answer the following. (Any two)   10
a) Explain concept of swaping in detail.
b) Write a short note on paging?
c) Explain virtual memory with advantage and disadvantage
d) Explain fregmentation and its types?

Q. 5   Answer the following. (Any two)   10
a) Explain different types of files?
b) Write a short note on NFS.
c) Explain Resource allocation graph.
d) Explain the concept of deadlock prevention.

P.T.O.

Q. 6   **Answer the following. (Any two)**   10
- a) Write short note on Application I/o interface.
- b) Write short note on Domain structure.
- c) Explain various types of virus.
- d) Explain different security violation methods.

Q. 7   **Answer the following. (Any three)**   15
- a) Explain different phases of compiler with diagram.
- b) Write a short note on system boot?
- c) Explain various scheduling criteria.
- d) Calculate page fault for following string using FIFO page replacement algorithm.

  7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1
- e) Write a short note on deadlock and its necessary condition.
- f) Write a short note on worm?

—— The End ——