MCS-203

POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS (PGDCA (NEW))

Term-End Examination

June, 2022

MCS-203 : OPERATING SYSTEMS

Time : 3 hours *Maximum Marks : 100*

(Weightage : 70%)

Note : *Question number **1** is **compulsory**. Attempt any **three** questions from the rest.*

1. (a) Define a Deadlock. Explain the necessary and sufficient conditions for a deadlock occurrence. Also explain how it can be prevented. *10*

(b) Write and explain the Lamport's Scheme of Ordering of Events in Distributed Systems. *10*

(c) Explain the file management system in iOS and also briefly mention the security aspects of file system. *10*

(d) Describe briefly Virtual Memory Organization and Demand Paging in WINDOWS-10. *10*

2. (a) Discuss briefly the following Scheduling algorithms :

(i) FCFS

(ii) Round Robin

(iii) Priority-based Scheduling

Explain the difference in the degree to which the above scheduling algorithms discriminate in favour of short processes. *10*

(b) Briefly explain the two non-contiguous disk storage allocation schemes, with the help of an illustration for each. *10*

3. (a) Describe the process management in LINUX which includes process priorities, process hierarchy, process states and threads management. *10*

(b) With the help of a simple block diagram, explain the XNU kernel architecture which was initially used for Mac OS. *10*

4. (a) Define Segmentation Scheme. With the help of a diagram, explain the principles of its operation. *10*

(b) Define Thrashing and explain the reason of its occurrence, with the help of an example. Describe briefly the techniques of prevention of thrashing. *10*

5. (a) What is a Semaphore ? Give solution to the Sleeping Barber Problem using Semaphore. *10*

(b) List the contents of a Process Control Block (PCB). Explain the significance of each of its components. *10*