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Roll No.

PAPER ID—14900

M.C.A. EXAMINATION, 2023

(First Semester)

SYSTEM SOFTWARE AND OPERATING
SYSTEM

Code : MCA 102

Time : 3 Hours

Maximum Marks : 80

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory.

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1. (a) What is Thread ? Explain. 4
- (b) What is spooling and what is the use of it in Batch operating system ? 4
- (c) Explain the FIFO page replacement algorithms with a suitable example. 4
- (d) Compare the contiguous and non-contiguous memory allocation. 4

Unit I

2. (a) What is a distributed operating system ? What are the advantages of the distributed operating system ? 8
- (b) What is meant by system call ? Discuss about types of system calls. 8
3. (a) Explain Microkernel and multithreading operating system designs with advantages and disadvantages. 8

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- (b) "Operating system is resource manager." Justify this statement with suitable functionality of OS. 8

Unit II

4. (a) What is a Critical Section ? Discuss the solution of the Critical Section problem. 8
- (b) Define Process. Explain various steps involved in change of a process state with process state neat transition diagram. 8
5. (a) What are the criteria for evaluating the CPU scheduling algorithms ? Explain the Round Robin scheduling algorithm with a suitable example. 8
- (b) What are semaphores ? Explain any three use cases of semaphores. 8

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Unit III

6. (a) What is virtual memory ? Describe its advantage with respect to user point of view and with respect to system point of view. 8
- (b) What is deadlock ? Explain the necessary condition for its occurrence. 8
7. (a) Explain in detail about deadlock detection techniques. How system can be recovered from a deadlock. 8
- (b) Write short notes on the following : 8
- (i) FCFS <https://www.haryanapapers.com>
- (ii) SSTF Disk Scheduling schemes.

Unit IV

8. (a) Explain Process management in Unix. 8
- (b) What are the different kinds of file permissions in UNIX OS ? Explain in brief. 8

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9. (a) Give the components of UNIX system.
Describe the role of kernel in UNIX. **8**
- (b) Explain the structure of UNIX operating system and its components in brief. **8**