[This question paper contains 2 printed pages]

6259-A *Your Roll No*

M.Sc. Computer Science/II Sem. **J**

MCS – 202 – OPERATING SYSTEM DESIGN AND PRACTICE

(OC)

Time 2 *hours* *Maximum Marks* 40

(Write your Roll No on the top immediately on receipt of this question paper)

Attempt **all** *questions Parts of a question should be answered together*

1 (a) Differentiate between the following

(i) Process tree hierarchy and file tree hierarchy

(ii) Operating system and hypervisor

(iii) UMA and NUMA multiprocessors (6)

(b) Briefly explain the steps taken by the operating system when a system call is issued by a process (4)

2. (a) How are preemptable resources different from nonpreemptable resources ? Give examples for both types of resources (3)

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(b) With the help of an example, explain what is a livelock ? (3)

(c) Explain the concept of time sharing and space sharing in the context of multiprocessor scheduling (4)

3 (a) Describe the layers in a Linux system (5)

(b) What is the use of a *task_struct* in Linux ? List the categories under which information is stored in it (5)

4 (a) Describe the *clone()* system call available in Linux Compare it with the *fork()* system call (4)

(b) With the help of a diagram, explain the disk layout of ext2 file system (3)

(c) A Linux i-node has 12 disk addresses for data blocks, as well as the addresses of single, double and triple indirect blocks If each of these holds 256 disk addresses, what is the size of the largest file that can be handled, assuming that a disk block is 1KB ? (3)