M.E. First Semester (Computer Sci. & Engg.) (F.T.) (CGS)

13143 : Operating System Design

1 RMEF 3 / 1 RME 3 / 1 KMEF 3

P. Pages : 2

Time : Three Hours

* 0 3 3 0 *

AW - 3674

Max. Marks : 80

Notes : 1. Due credit will be given to neatness and adequate dimensions.
2. Assume suitable data wherever necessary.
3. Illustrate your answer necessary with the help of neat sketches.
4. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) Give and explain the meaning of system context, Address context & Hardware Context under Linux. **7**

b) What is forking ? What is work done by "Copy Process". **6**

OR

2. a) List and explain all process states. Explain the flowchart for all process states. **7**

b) Explain the difference between - **6**
i) Kernel space & user space
ii) Function call & system call.

3. a) Explain the wait ( ) & sleep ( ) system calls. **6**

b) Differentiate between : **7**
i) Direct and indirect block mode.
ii) Preemptive and non-preemptive scheduling.

OR

4. a) What is fair scheduling ? Explain in brief. **7**

b) Explain the typical structure of system call handler and its implementation under Linux. **6**

5. a) What is meant by locking ? Explain with example. **7**

b) What is meant by completion variables ? Explain. **7**

OR

6. a) Explain atomic operation. Enumerates its advantages. **7**

b) Define each of the following terms giving its significance. **7**
i) Semaphores ii) Scalability
iii) Race condition

7. a) Explain : 6
   i) Pages ii) Zones

   b) What is meant by slab layer ? Why it is needed ? Give design of slab layer. 7

OR

8. Differentiate between : 13

   i) RTC & system timer ii) Paging and demand paging

   iii) Page fragment and page fault iv) Jiffies & tick rate

9. a) What is superblock object ? Explain in brief any three super block operations. 7

   b) Differentiate between 7
   i) File system and disk scheduler.
   ii) Dentary object and super block object.

OR

10. a) What is job of I/O schedular ? Describe in brief Linus Elevator ? 7

    b) Describe the various data structures associated with process. 7

11. a) What is purpose of radix tree ? Explain its role in page cache. 7

    b) With the help of suitable example explain how is buffer cache used in writing data block to the disk. 6

OR

12. a) What is meant by "Process address space" ? Describe process address space under Linux. 7

    b) What is purpose of memory descriptor ? Explain the meaning of each field in it. 6

****