

May - June - 2011



T.E. (Computer Engineering) (Semester – II) Examination, 2011
SYSTEMS PROGRAMMING AND OPERATING SYSTEMS (New)
(2008 Pattern)

Time: 3 Hours

Max. Marks: 100

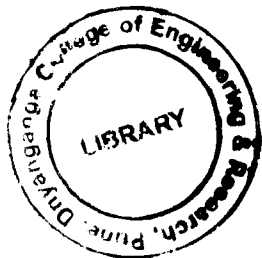
Instructions : 1) Answer 3 questions from Section I and 3 questions from Section II.

2) Answers to the two Sections should be written in separate books.

3) Neat diagrams must be drawn wherever necessary.

4) Black figures to the right indicate full marks.

5) Assume suitable data, if necessary.



SECTION – I

1. a) Assembly language is nearer to Machine. Justify. 2
b) Write an algorithm for second pass of a two pass assembler. Which searching technique improves the performance of algorithm and how ? 10
c) How one pass assembler can handle forward references ? 4

OR

2. a) What are the differences between macros and functions ? 4
b) How to handle macro calls within macros ? 8
c) Conditional expansion of Macro is a useful feature. Justify. 4
3. a) Define relocation. How the Direct linking loader handles relocation and linking ? 10
b) What is dynamic loading ? List the advantages of overlay structure. 6

OR

4. a) Draw the flow chart for pass-2 of direct linking loader. 12
b) What are the functions done by the loader ? 4

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5. a) Library functions are different from system calls. How ? 4
- b) What is use of fork() and exec() system calls ? Give example of each. 6
- c) Signals can be sent in either direction and can be used to provide limited from of interprocess communication (IPC). Justify. 8

OR

6. a) State whether the following statements are **true/false**. 4
- 1) Java run time environment is a system of multiple processes with multiple threads.
 - 2) The states of process and threads are same.
 - 3) Dekker's algorithm is used for enforcing mutual exclusion.
 - 4) In MIMD a set of processors simultaneously execute different instruction sequences on different data set.
- b) Explain different thread scheduling algorithms in multiprocessor systems. 14

SECTION – II

7. a) Compare interprocess communication using shared memory and message passing. 4
- b) What are the control problems faced in case of competing processes ? 12

OR

8. a) What are the requirements of mutual exclusion ? 6
- b) List the differences between semaphores and monitors. 4
- c) Give solution to bounded-buffer producer consumer using semaphores. 6
9. a) Bankers algorithm is used for deadlock avoidance. Explain. 6
- b) State the conditions for dead lock. 6
- c) How to prevent the dead lock ? 6

OR



10. a) Given the memory portions of size 100 k, 500 k, 150 k, 300 k, 550 k in order how would each of the first fit, best fit and next fit algorithms place the processes of 215 k, 417 k, 115 k and 425 k in order ? **12**
- b) What are the advantages and disadvantages of fixed and dynamic portioning ? **6**
11. a) Explain various buffering schemes. **6**
- b) Consider a disk system with 100 cylinders. The requests to access the cylinders occur in the following sequence. **10**
- 4, 35, 10, 7, 18, 74, 2, 15, 6, 20
- Assume that the head is at track 50. Calculate the average seek length for the FIFO, SSTF and C-SCAN.

OR

12. a) With the help of diagram explain file system architecture. **6**
- b) What are the methods of record blocking ? **6**
- c) Write short note on file management under UNIX. **4**