Seat
No.

T.E. (Computer Engineering) (Semester – II) Examination, 2014
SYSTEMS PROGRAMMING AND OPERATING SYSTEM
(2008 Course)

Time : 3 Hours   Max. Marks : 100

Instructions : 1) Answers to the **two** Sections should be written in **separate** answer books.
2) Answer **any three** questions from **each** Section.
3) **Neat** diagrams must be drawn **wherever** necessary.
4) Figures to the **right** side indicate **full** marks.
5) Assume suitable data if **necessary**.

SECTION – I

1. a) Define following terms with example :   6
   a) Forward Reference
   b) Intermediate Representation
   c) Language Processing.

   b) Describe conditional macro expansion.   6

   c) What are different ways in which we can specify arguments to macros ? Explain.   6

                                           OR

2. a) Explain the formats of data structure required for design of two pass assembler. Also
      explain their significance in Pass I and Pass II.   10

   b) Draw the flowchart for one pass macro processor.   8

3. a) Draw and explain flowchart of Absolute Loader Design.   8

   b) Write short note on MS-DOS linker.   8

                                           OR

4. a) Explain in detail design of direct linking loader. Also explain how it performs relocation.   8

   b) Explain in brief compile and go loader scheme. What are advantages and disadvantages
      of it.   8

5. a) Consider the following set of processes, with the length of CPU burst time given in milliseconds. **12**

Process	Burst time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0. What is Turnaround time and Waiting time of each process for FCFS, SJF, non preemptive priority and RR (Quantum 1) scheduling ? Which algorithm is having shortest Avg. waiting time ?

b) Differentiate between process and thread. **4**

OR

6. a) What are system calls ? Enlist major categories of system call. **8**

b) What is PCB ? Explain process state transition with the help of diagram. **8**

SECTION – II

7. a) Write and explain Deadlock Avoidance Bankers Algorithm. **8**

b) What is inter process synchronization ? Write solution for producer consumer problem using semaphore. **8**

OR

8. a) Write and explain deadlock recovery techniques in detail. **8**

b) Describe dinning philosopher's problem and give solution for it. **8**

9. a) Consider the following page reference string : **12**

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 3, 7, 6, 3, 2, 1, 2, 3, 6

How many page faults would occur for following page replacement algorithms three frames ?
1) FIFO
2) LRU
3) Optimal.

b) Compare paging and segmentation. **6**

OR

10. a) What is virtual memory management ? Explain address translation in paging system. **8**

b) Explain with example following allocation algorithms with their advantages and disadvantages : **10**
a) First fit
b) Best fit
c) Worst fit.

11. a) Explain and compare continuous, linked and hashed allocation techniques for file allocation. **8**

   b) What is I/O buffer ? Explain buffering techniques. **8**

                    OR

12. a) Consider a disk system with 100 cylinders. The request to access the cylinders occur in following sequence : **12**

   4, 34, 10, 7, 19, 73, 2, 15, 6, 20

   Assume head is at cylinder 73 compute avg. seek length for FCFS, SSTF, SCAN, C-SCAN.

   b) Write short note on disk space management. **4**

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