[5253] - 155
T.E. (E & TC)
SYSTEM PROGRAMMING AND OPERATING SYSTEM
(2012 Pattern)

Time : 2½ Hours]   *[Max. Marks : 70*
Instructions to the candidates :
   1)   Answer Q1 or Q2,Q3or Q4,Q5 or Q6, Q7 or Q8
   2)   Neat diagrams must be drawn wherever necessary.
   3)   Figures to the right side indicate full marks.
   4)   Assume suitable data, if necessary.

Q1) a)   Write short note on MS DOS linker.   **[7]**

   b)   Define language processor. Also explain various language processing
        tools.   **[7]**

   c)   What are the differences between Macros and Functions?   **[6]**

                                        OR

Q2) a)   Show parsing steps of <id>+<id>*<id> according to the following
        grammar: **[7]**

        E   ::=   TE"
        E"   ::=   +E | ε (epsilon)
        T   ::=   VT"
        T"   ::=   *T | ε (epsilon)
        V   ::=   <id>

   b)   Explain the advance macro facilities   **[7]**

        i)   Alteration of flow of control during expansion

        ii)   Expansion time variables

        iii) Attributes of parameters

   c)   Explain software tools for program development.   **[6]**

Q3) a)   Explain dining philosophers problem and Producer Consumer problem**[6]**

   b)   Explain Process Control Block (PCB) in details.   **[6]**

   c)   What are the 4 ways of handling deadlocks? Explain each with an example.
                                                                                    [6]

Q4) a) Explain the concept critical region and mutual exclusion with examples.**[6]**

   b) What are threads? How are they different from processes? List different types of thread models. **[6]**

   c) Consider the following processes where Arrival and Burst time are as shown below. **[6]**

Process	Burst Time	Arrival Time
P1	05	0
P2	04	2
P3	07	3
P4	06	5

Calculate the Average Waiting Time and Average Turn-around Time if the processes are scheduled using FCFS.

Q5) a) Consider the following Page reference string :8, 1, 3, 1, 8, 6, 4, 3, 8, 4, 8, 7, 1, 2 The number of page frames = 3, calculate the page faults and the hit ratio for Least recently used algorithm. **[8]**

   b) Explain Virtual Memory with Segmentation **[8]**

OR

Q6) a) Explain design issues in paging. What is Demand paging? Explain with example. **[8]**

   b) Explain the First fit, Best fit and Worst fit algorithms with example. **[8]**

Q7) a) Explain Linux file system **[8]**

   b) Explain I/O software layers with diagram **[8]**

OR

Q8) a) Write short note on magnetic disks and optical disks. **[8]**

   b) Explain Interrupt driven I/O and I/O using DMA. **[8]**

✦✦✦✦