(REVISED COURSE)

(3 Hours)   **[Total Marks : 100**

N.B. : (1)   Question No. **1** is **compulsory**.

      (2)   Attempt any **four** questions from **remaining** questions.

      (3)   Assume **data** if **required**.

1. (a)   What is systems software ? How it differs from application software.   **10**
Give eg. of systems software and explain its advantages to the user.

   (b)   Explain different types of grammars and ambiguity in grammatic   **10**
specification.

2. (a)   With respective to assembler explain the following :—   **10**

      (i)   Statement Format

      (ii)   Types of assembly language statements

      (iii)   Advantages of assembly language.

   (b)   Explain Design of Pass II assembler.   **10**

3. (a)   Define Macro. What is macro call and Macro Expansion ?   **10**

   (b)   Compare and contrast the properties of macros and subroutines with   **10**
respect to the following :–

      (i)   code space requirements

      (ii)   Execution speed

      (iii)   Processing required by the assembler.

4. (a)   Explain code optimization phase of a compiler.   **10**

   (b)   Explain Non-relocatable programs, relocatable programs and Self   **10**
relocating programs.

5. (a)   Explain Resource allocation and User interface functions of the   **10**
Operating System.

   (b)   What is multiprogramming operating system ? Explain functions   **10**
of Multiprogramming supervisor.

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6. (a) Explain with eg. different scheduling policies.   10

    (b) What is Deadlock? Explain deadlock detection algorithm.   10

7. (a) An OS contains 3 resource classes. The number of resources units   10
       in these classes is 7, 7, 10 resp. The current allocation state is as
       shown below :—

Process	Allocated resources			Maximum requirement		
	r1	r2	r3	r1	r2	r3
p1	2	2	3	3	6	8
p2	2	3	3	4	3	3
p3	1	2	4	3	4	4

    (i) is current allocation state safe ?

    (ii) could the following request be granted in the current state ?
        p3 requests (0, 1, 0).

    (b) With eg. explain FIFO and LRU page replacement algorithms.   10
       For your eg. which algorithm is better.