

- N.B.** (1) Question No.1 is compulsory.
(2) Solve any **four** questions from questions Nos. 2 to 7.
(3) Assume suitable data whenever necessary and justify it.

1. (a) Following Program is for 8086 processor. Give result for program after first pass and second pass of assembler with relative address of each instruction. **10**

```

SAMPLE      START      4000
              USING     *, BX
              MOV       BL, NUM1
              ADD       BL, NUM2
              MOV       RESULT,BL
NUM1         DC        10H
NUM2         DC        20H
RESULT      DS        ?
              END
    
```

- (b) The available space list of 1K-word memory has the following entries at time t. **10**

Region	Address	Size (Word)
0		200
250		150
450		100
700		185
999		25

The following sequence of allocation requests is then receive

Time	t+1	t+2	t+3	t+4
Size of block	135	25	170	100

to be allocated. Determine the available space list after all these request have been serviced using (i) Best-fit and (ii) First fit allocation scheme.

2. (a) Explain Macro and Database for 2-pass Macro. **10**
(b) Explain relocatable loader with reference to following examples. Calculate relocatable address for following programs. Consider all instructions as 1-byte instruction and program is stored from location 0000H and it is loaded starting at location 2010. **10**

```

LOAD      1234
ADD       9000
BRANCH   4567R
STORE    7000R
    
```

Where R indicate relocatable address.

3. (a) Explain the term multiprogramming, multitasking, multiprocessor in context with operating system. **10**
(b) Explain process and state diagram for PCB. **10**
4. (a) Following are three process which perform specific task. Sequence for processes are each P,Q,R,. **10**
Give Sequence and address in which instruction within process will execute and why process are executed in that sequence.

Process P :-

```

4000  Addition
4001  Subtraction
4002  Multiply
4003  Division
4004  Take input from keyboard
4005  SORT
4006  Change Sign
4007  Calculate mean
    
```

Process Q :-

```

6000  Data transfer within register
6001  Take complement
6002  Take printout
6003  Addition
6004  Subtraction
6005  Multiply
    
```

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Process R :-

- 8000 Multiply
- 8001 Find greater number
- 8002 Store result on floppy disk
- 8003 Addition
- 8004 Division

- (b) Explain different types of scheduler and preemptive non-preemptive scheduling algorithm. **10**
5. (a) Explain deadlock and condition for avoidance and prevention of deadlock. **10**
(b) "Size of page is too small or too large". What is the effect of this on system performance. **10**
6. (a) Differentiate between DOS and UNIX. **10**
(b) Explain file organisation and access methods. **10**
7. Write detailed notes on :- **20**
- (a) System calls and drivers
 - (b) Page segmented memory
 - (c) Interprocess Communication.