

**SECTION A ANSWER ALL Questions in this section**

**QUESTION 1**

- a) A typical file system structure on a disk is split into 5 layers. What are the five layers called? [5]
- b) Name the four general purpose registers found in the 8086 microprocessor, each general purpose register also has special functions, state what they are. [8]
- c) What is the difference between Immediate addressing and Direct addressing? [2]
- d) What do the instructions CMP and JNZ do? [2]
- e) What are the three conditions that need to be satisfied in the critical section problem of process synchronization. [2]
- f) What is level 1 cache memory? [1]

[TOTAL 20]

SECTION B SELECT ANY TWO Questions from this section

## QUESTION 2

- a) Convert 20H and 80H to Decimal values.

Multiple the two values together and convert the result back to Hexadecimal.

If register AL contains the value 20H and register CL contains the value 80H.

What register is used to store the result of executing the instruction MUL CL as calculated above?

[8]

- b) Register AX contains the value A064H. Upon executing the instruction MUL AX

a result of 647D2710H is obtained, this is too big to fit in register AX. What other register is used to store part of the result? Show what value is stored in each register.

[4]

- c) Convert the following values to Binary, show all your workings:

55AA Hexadecimal and 1234 Decimal

[2]

- d) Identify the addressing modes in each of these instructions.

- i) MOV AX,BX
- ii) MOV AH,7
- iii) MOV [DI],AL
- iv) MOV AL[SI+6]

[4]

- e) How many times does the NOP instruction execute in the following sequence? Explain your answer.

MOV CX,20H  
 XYX: PUSH CX  
 MOV CX,9

ABC: NOP  
 LOOP ABC  
 POP CX  
 LOOP XYZ

[7]

[Total 25]

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### QUESTION 3

a) What does the term RAID stand for?

[2]

b) Through the principles of abstraction, we can view the computer to be built from a hierarchy of 7 levels. Each level has a specific function and can be seen as a distinct abstraction.

i. What are the names of the seven levels?

[7]

ii. Write brief notes describing each level's function.

[12]

c) Outline the differences between a DVD and a CD.

[4]

[Total 25]

### Question 4

a) Write short notes on the following hard disk structures:

CLUSTER

SECTOR

MASTER BOOT RECORD

[6]

b) What are the advantages and disadvantages of FIXED\_PARTITION MEMORY MANAGEMENT?

[4]

c) When dealing with variable partition memory management, what are the three placement strategies that can be employed?

[6]

d) What is meant by the term little endian?

[1]

e) What is the difference between Preemptive vs. Non-preemptive Scheduling?

[8]

[Total 25]