I/47—22 Roll No. .....

Annual Examination, 2022

B.Sc. Part II

INFORMATION TECHNOLOGY

Paper I

(Digital Circuits & Computer H/W)

Time : 3 Hours] [MAXIMUM MARKS : 50

Note : *Section 'A' is Objective type and is compulsory. It should be written on the* ***first page*** *of Answer-book. Section 'B' is Short answer type and Section 'C' is Long answer type.*

Section 'A'

(Multiple Choice Questions) **1×10=10**

Choose the correct answer :

(i) The decimal equivalent of the binary number $(101110)_2$ is :

(a) $(50)_{10}$ (b) $(47)_{10}$

(c) $(110)_{10}$ (d) $(58)_{10}$.

(ii) Obtain the 9's complement of the eight digit decimal No. 12349876.

(a) 99019899 (b) 9999999

(c) 09990048 (d) 87650123.

P.T.O.

(iii) A half-adder does not have ..... .

(a) Carry in (b) Carry out

(c) Two inputs (d) All of these.

(iv) How many 128 × 8 memory chips are needed to provide a memory capacity of 4096 × 16 ?

(a) 128 (b) 64

(c) 48 (d) 32.

(v) A J-k Flip-Flop is in a "no change" Condition when :

(a) J = l, k = 1 (b) J = l, k = 0

(c) J = 0, K = l (d) J = 0, k = 0.

(vi) Edge-triggered flip-flops must have :

(a) Very fast response time.

(b) At least two inputs to handle rising and falling edge.

(c) Positive edge detection circuits.

(d) Negative edge detection circuits.

(vii) How many types of multivibrators are :

(a) 2 (b) 3

(c) 4 (d) 5.

2. Explain J–k Flip-Flop with block diagram.

Or

Discuss about multiplexer.

3. Explain master-slave flip-flop.

Or

What is multivibrator ? Explain the working of astable multivibrator.

4. Explain different addressing modes with examples.

Or

Explain different features of Input-Output organizations.

5. Explain different memory management techniques.

Or

Explain different auxiliary memories.

✪ ✪ ✪ c ✪ ✪ ✪ ✪ ✪

(viii) The method which offer higher speeds of I/O transfer is :

(a) Interrupts

(b) Memory mapping

(c) Program-controlled I/O

(d) DMA.

(ix) When power is switched off which memory loses its data ?

(a) Non-volatile memory

(b) Volatile memory

(c) Both a and b

(d) None of the above.

(x) The fastest data access is provided using :

(a) Cache (b) DRAM

(c SRAM (d) Registers.

Section 'B'

(Short Answer Type Questions) **3×5=15**

Note : *All the* ***five*** *questions are compulsory.*

1. Convert the following :

(a) $(1001110)_2 = (?)_8$ (b) $(16\,A)_{16} = (\quad)_2$

Or

Explain Error detection code.

2. What is binary counters ?

Or

Explain half adder circuit and its logic.

3. What is cache memory ?

Or

What is Flip-Flop circuit ?

4. Draw the block diagram of CPU and briefly explain each part.

Or

Explain DMA.

5. Differentiate between primary memory and secondary memory.

Or

What do you mean by virtual memory ?

Section 'C'

(Long Answer Type Questions) **5×5=25**

Note : *All the* ***five*** *questions are compulsory.*

1. Explain Demorgan's theorem with its logical table.

Or

Explain *k*-map and its simplification with example.