

Duration: 2 ½ Hrs.

Total Marks: 75

- Note: i. All questions are compulsory.
ii. Figures on right indicate maximum marks.

Q. 1 Answer the following

a Explain Von Neumann Architecture. 8

OR

a Explain the Functional view of a computer. 8

b Draw the Basic Structure of CPU and explain each block. 7

OR

b Explain the generation of computers. 7

c Convert the following : i) $(268.75)_{10} = ()_2$ ii) $(0011.101)_2 = ()_8$ 5

OR

c Convert the following: i) $(359.72)_8 = ()_{16}$ ii) $(8D.9C)_{16} = ()_{10}$ 5

Q. 2 Answer the following

a Explain Half Adder and Full Adder with circuit diagram. 8

OR

a Explain the working of J-K flip flop. 8

b Explain De Morgan's Theorems. 7

OR

b What is Multiplexer? State its advantages. Explain 4 x 1 multiplexer. 7

c Prove that: $(A + \bar{B} + AB)(A + \bar{B})(\bar{A}B) = 0$ 5

OR

c For the logical expression draw the K-map and obtain the simplified logical expression. 5

$$Y = \sum m(1,5,7,9,11,13,15)$$

Q. 3 Answer the following

a Explain the characteristics of Memory System. 8

OR

a What is ROM? Explain its types. 8

b What is Optical Memory? Explain its types. 7

OR

b Explain the concept of Virtual Memory. 7

c Differentiate between SRAM and DRAM. 5

OR

c Differentiate between Asynchronous data transfer and Synchronous data transfer. 5

Q. 4 Attempt any three of the following

15

a Perform $(11001)_{10} - (1101)_{10}$ using 1st complement method.

b What are Registers? Explain Serial In – Serial Out Register.

c Explain the instruction pipelining.

d Perform: i) $(1100)_2 \times (0100)_2$ ii) $(110)_2 \div (011)_2$

e Convert expression $Y = AB + AC + BC$ into their canonical SOP forms:

f Differentiate between EPROM and EEPROM.