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Roll No. ....

**4th Sem.**

**Branch : Elect.**

**Sub : Digital Electronics**

**Time : 3 Hrs.**

**M.M. : 100**

**SECTION-A**

**Note: Multiple Choice Questions. All Questions are compulsory. (10x1=10)**

- Q.1 The binary number 11101111 is of \_\_\_\_\_ bits.  
a) 1                                      b) 2  
c) 4                                      d) 8
- Q.2 A NAND gate is equivalent to an AND gate followed by \_\_\_\_\_ gate.  
a) AND                                      b) XOR  
c) NAND                                      d) NOT
- Q.3  $A + \bar{A} =$  \_\_\_\_\_  
a) 0                                      b) 1  
c) A                                      d)  $\bar{A}$
- Q.4 The inverter gate is called as \_\_\_\_\_ gate.  
a) NAND                                      b) NOR  
c) AND                                      d) NOT
- Q5. A full adder has \_\_\_\_\_ inputs and \_\_\_\_\_ outputs  
a) 2,2                                      b) .2,3  
c) 3,2                                      d) 4,2

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Q.6 What is the condition for J-K flip-flop to toggle?

- a)  $J=0, K=0$                                       b)  $J=1, K=0$   
c)  $J=0, K=1$                                       d)  $J=1, K=1$

Q.7 3- Variable K-Map has \_\_\_\_\_ cells.

- a) 9                                      b) 6  
c) 8                                      d) 3

Q.8 The number of clocks that a decade counter counts are.....

- a) 4                                      b) 8  
c) 10                                      d) 16

Q.9 The number of select lines for a 16:1 MUX are \_

- a) 1                                      b) 2  
c) 4                                      d) 5

Q.10 Shift register is a combination of \_\_\_\_\_

- a) Flip-Flops                                      b) Encoders  
c) Decoders                                      d) Counters

**SECTION-B**

**Note: Objective type questions. All questions are compulsory. (10x1=10)**

- Q.11 Convert binary number 101101 into decimal number.
- Q.12 Define encoder.
- Q.13 Draw the symbol of NOR gate.
- Q.14 Define Max Term.
- Q.15 PISO stands for \_\_\_\_\_.
- Q.16 Define Latch.

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- Q.17 Add  $(1010)_2 + (1101)_2$   
 Q.18 Define A/D converter.  
 Q.19 Expand EPROM.  
 Q.20 Name the IC used for ALU.

### SECTION-C

**Note: Short answer type Questions. Attempt any twelve questions out of fifteen Questions. (12x5=60)**

- Q.21 a) Convert  $(135)_{10}$  into  $( )_2$ ,  $( )_8$  and  $( )_{16}$   
 b) Convert binary number 110101 into gray code  
 Q.22 Explain NAND gate as universal gate.  
 Q.23 Explain the working of Full adder using Half adder.  
 Q.24 State and prove De-Morgan's theorem.  
 Q.25 State the advantages of digital signals over analog signals.  
 Q.26 Explain different types of semiconductor memory.  
 Q.27 Explain Decoder with block diagram.  
 Q.28 List the applications of A/D converter.  
 Q.29 Explain SISO with block diagram.  
 Q.30 Explain 7 Segment display device with neat diagram.  
 Q.31 Write any five difference between Latch and Flip flop.  
 Q.32 Differentiate between Synchronous and Asynchronous Counters.  
 Q.33 Draw and explain the diagram of Ring Counter.  
 Q.34 Write hierarchy of Semiconductor memory.  
 Q.35 Explain the working of single slope A/D converter.

### SECTION-D

**Note: Long answer questions. Attempt any two questions out of three Questions. (2x10=20)**

- Q.36 Simplify using K-Map and realize the circuit using NAND gate only.  

$$Y = \sum m(0, 1, 5, 9, 13, 14, 15) + \sum d(3, 4, 7, 10, 11)$$
  
 Q.37 What do you mean by Race around condition? How Master Slave J-K Flip Flop is used for the solution of race around condition?  
 Q.38 Explain the working of Successive approximation type analog to digital convertor with circuit diagram.