***C-14 -AEI -304***

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING**

**MODEL PAPER -I**

**DIGITAL ELECTRONICS**

[Time: 3 Hours] [Total Marks: 8**0]**

**PART – A 10x 3 = 30**

**Instructions :** *Answer all questions. Each question carries three marks.*

1) Compare weighted and Un-weighted codes.

2) State De-Morgan’s theorems.

3) State the function of the Half-adder

4) List the applications of MUX .

5) Study the need for preset.

6) Define sequential logic circuits

7) Differentiate between synchronous and asynchronous inputs.

8) List various types of memories

9) State the need for a Register.

10) State the need for D/A conversion.

**PART – B 5 x10 = 50**

**Instructions :** *Answer any five questions. Each question carries ten marks*

11) a) Explain AND, OR, NOT operators with truth table.

b) Explain Binary and Octal number systems

12) a) Develop AND, OR, NOT operations using NAND, NOR gates.

b) subtract **1110.00** from **101.101** using 2’s complement method.

13) a) Draw and explain the operation 4 X 1 Multiplexer

b) Draw Half adder circuit using Exclusive OR gate and an AND gate.

14) Draw and explain two-bit digital comparator.

15) Explain the decade counter.

16) Explain JK Master Slave flip flop with truth table

17) a) Differentiate between ROM and RAM

b) Explain working of serial in Parallel out and Parallel in serial out Registers.

18) Explain A/D conversion using successive approximate method

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**STATE BOARD OF TECHNICAL EDUCATION & TRAINING**

**MODEL PAPER -2**

**DIGITAL ELECTRONICS**

[Time: 3 Hours] [Total Marks: 8**0]**

**PART – A 10x 3 = 30**

**Instructions :** *Answer all questions. Each question carries three marks.*

1. Explain the importance of parity bit.
2. Multiply 1011 by101using binary multiplication.
3. List the applications of decoders
4. Draw Half adder circuit using Exclusive OR gate and an AND gate
5. Study the need for preset.
6. Define a Flip Flop.
7. Define Modulus of a counter
8. State the need for a Register.
9. State different types of ROM.
10. State the need for A/D converters.

**PART – B 5 x10 = 50**

**Instructions :** *Answer any five questions. Each question carries ten marks*

11) a) State De-Morgan’s theorems.

b) Explain the working of NAND, NOR gates using truth tables.

12) a )Use 1’s and 2’s complement to perform the following binary subtraction 1111-0101.

b)State different postulates in Boolean algebra.

13) a)Explain the working of 4 X2 encoder.

b) Realize Half Adder using only NOR gates and NAND gates.

14) Draw and explain two-bit digital comparator.

15) a) Explain T-Flip Flop with the help of truth table and only NAND gates.

b) Design and explain a decade counter using JK Flip-Flop.

16) . a) Design a Mod-8 ripple counter.

b)Design and explain the working of 4-bit up-down counter.

17) a )Explain the working of dynamic RAM.

B) Explain the working of universal shift register.

18) a) Explain D/A conversion using weighted resistors

b) Explain A/D conversion using counter method