(Model Paper) **C –20, EC -303**

State Board of Technical Education and Training, A. P

Diploma in Electronics and Communication Engineering (DECE)

III Semester

Subject Name: Digital Electronics

Sub Code: EC - 303

Time: 90 minutes **Unit Test-I** **Max.Marks:40**

Part-A **16Marks**

Instructions: (1) Answer **all** questions.
(2) First question carries **four** marks, each question of remaining carries **three** marks

1. Convert the following numbers into binary number system (CO1)
   a) 25_{10} b) 72_8 c) AB_{16} d) $2A_{16}$
2. Perform the binary subtraction of following two numbers using 2's complement method (CO1)

   101101_2

   -100110_2
3. State De-Morgan's theorems (CO1)
4. Classify different logic families (CO2)
5. Define the terms: propagation delay, Noise margin, Fan out of digital ICs (CO2)

Part-B **3×8=24**

Instructions: (1) Answer **all** questions.
(2) Each question carries **eight** marks
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. (a) Realize AND, OR, NOT operations using NAND, NOR gates (CO1)

   (or)

   (b) Simplify the following Boolean Expression using Karnaugh map (CO1)

   $$Y = A\overline{B}C + AB\overline{C} + \overline{A}\overline{B}C + ABC$$

7. (a) Explain the working of open collector TTL NAND gate with circuit diagram. (CO2)

   (or)

   (b) Explain the working of Totem-pole output TTL NAND gate with circuit diagram. (CO2)
8. (a) Explain 4-bit parallel adder cum 2's compliment subtractor circuit. (CO3)

   (or)

   (b) Explain the operation of Full adder circuit with truth table using Ex-OR gate and basic gates. (CO3)

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MODEL PAPER

Diploma in Electronics and Communication Engineering (DECE)

III Semester

Subject Name: Digital Electronics

Sub Code: EC - 303

Time: 90 minutes **Unit Test II** **Max.Marks:40**

Part-A **16Marks**

Instructions: (1) Answer **all** questions.
(2) First question carries **four** marks, each question of remaining carries **three** marks

1. a) Write one example for combinational logic circuit? (CO3)
   b) Write one example for sequential logic circuit? (CO4)
   c) Write full form of EEPROM (CO5)
   d) Write full form of NV RAM (CO5)
2. Compare the performance of serial and parallel adder (CO3)
3. State the need for preset and clear inputs. (CO4)
4. List the applications of flip flops (CO4)
5. Classify different types of semiconductor memories (CO5)

Part-B **3×8=24**

Instructions: (1) Answer **all** questions.
(2) Each question carries **eight** marks
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. (a) Explain the working of 4-bit asynchronous counter with circuit diagram and timing diagram. (CO3)

   (or)

   (b) Explain the working of asynchronous decade counter with circuit diagram and timing diagram. (CO3)

7. (a) Explain the working of 4-bit shift left register with Circuit diagram (CO4)

   (or)

   (b) Explain the working of 4-bit shift right register with Circuit diagram. (CO4)
8. (a) Explain working of diode ROM with suitable circuit diagram (CO5)

   (or)

   (b) Explain the working of basic dynamic MOS RAM cell with suitable circuit diagram (CO5)

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MODEL PAPER

BOARD DIPLOMA EXAMINATIONS

C-23, EC-303, DIGITAL ELECTRONICS

III SEMESTER

SEMESTER END EXAMINATION

TIME:3 HOURS MAX MARKS:80

Part-A **10×3=30**

Instructions: (1) Answer **all** questions.
(2) Each question carries **three** marks
(3) Answer should be brief and straight to the point and shall not exceed five simple sentences.

1. Convert the following numbers into binary number system (CO1)
   a) 25_{10} b) 72_8 c) AB_{16}
2. Perform the following binary subtraction using 2's complement method (CO1)
   (CO1)
   101101_2
   -100110_2

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3. Classify different logic families (CO2)
4. List types of tri-state buffers. (CO2)
5. Draw Half adder circuit and give its truth table (CO3)
6. Compare the performance of serial and parallel adder (CO3)
7. State the need for preset and clear inputs. (CO4)
8. List the applications of flip flops (CO4)
9. Classify different types of semiconductor memories (CO5)
10. State the difference between Flash ROM and NV RAM (CO5)

Part-B **5×10=50**

Instructions: (1) Answer **any 5** questions.
(2) Each question carries **ten** marks
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Realize AND, OR, NOT operations using NAND, NOR gates (CO1)
12. Simplify the following Boolean Expression using Karnaugh map (CO1)

$$Y = A\overline{B}C + AB\overline{C} + \overline{A}\overline{B}C + ABC$$

13. Explain the working of Totem-pole output TTL NAND gate with circuit diagram. (CO2)
14. Explain 4x1 Multiplexer with logic circuit diagram (CO3)
15. Realize one-bit digital comparator circuit using gates (CO3)
16. Explain the working of master slave JK flip flop (CO4)
17. Explain the working of 4-bit asynchronous counter with circuit diagram and draw the timing diagram. (CO4)
18. Explain working of diode ROM with suitable circuit diagram (CO5)

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