Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17EC2001 (For Arts and Science)** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DIGITAL ELECTRONICS** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Convert the following decimal number to their binary equivalent   1. 35 ii. 18 | CO1 | 1 |
| b. | Convert the following binary digit to octal and hexadecimal number  101101110 | CO1 | 1 |
| c. | Express the following decimal number to Excess3 form   1. 375 ii. 418 | CO1 | 2 |
| d. | Convert the following BCD code to decimal number   1. 1010010111 ii. 100001101001 | CO1 | 2 |
| e. | Using the K−map simplify the following function obtain their SOP and POS  F(w,x,y,z) =∑(1,3,4,5,6,7,9,12,13) | CO1 | 14 |
| **(OR)** | | | | |
| 2. | a. | Convert the binary number 101001 to 1’s complement. | CO1 | 1 |
| b. | State De-Morgan’s theorem. | CO1 | 1 |
| c. | Add the following numbers using 2’s complement method.   1. +38 and −22 ii. +49 and −37 | CO1 | 2 |
| d. | Reduce the given Boolean expression.   1. AB’C + A’BC + ABC 2. AB + B + A + C | CO1 | 2 |
| e. | Explain the term Universal Gate. Describe how the basic gates can be realized using NAND and NOR gates. | CO1 | 14 |
|  |  |  |  |  |
| 3. | a. | Name the classification of digital system. | CO2 | 1 |
| b. | List out any two combinational circuits. | CO2 | 1 |
| c. | Draw the logic gate of 4 X 1 Multiplexer. | CO2 | 2 |
| d. | Differentiate a decoder from a Demultiplexer. | CO2 | 2 |
| e. | Write the Truth Table and Boolean expression for the Full Adder. Draw the circuit diagram of it. | CO2 | 14 |
| **(OR)** | | | | |
| 4. | a. | Draw the circuit diagram of Half Adder. | CO2 | 1 |
| b. | In combinational circuit, present input is determined by \_\_\_\_\_\_\_\_\_. | CO2 | 1 |
| c. | Sketch neat diagram of demultiplexer. | CO2 | 2 |
| d. | List the applications of multiplexer. | CO2 | 2 |
| e. | With a neat diagram explain 4 bit parallel binary adder. | CO2 | 14 |
|  |  |  |  |  |
| 5. | a. | What is a Latch? |  | 1 |
| b. | Syncronous circuit change the state only when \_\_\_\_\_\_\_\_\_. are present. | CO2 | 1 |
| c. | Name any two applications of flip flop. | CO2 | 2 |
| d. | Write the working principles of Ring Counter. | CO2 | 2 |
| e. | Explain the working principle of Master−Slave flip flop. | CO2 | 14 |
| **(OR)** | | | | |
| 6. | a. | Define state diagram. | CO2 | 1 |
| b. | Name the different types of shift register. | CO2 | 1 |
| c. | Draw the state table and excitation table of T flip flop. | CO2 | 2 |
| d. | List the classifications of sequential circuit. | CO2 | 2 |
| e. | Design a 3 bit synchronous counter using D flip flop. | CO2 | 14 |
|  |  |  |  |  |
| 7. | a. | List the types of ROM. | CO3 | 1 |
| b. | Define PLD. | CO3 | 1 |
| c. | Distinguish static RAMs and Dynamic RAMs. | CO3 | 2 |
| d. | What is Programmable Logic Array? How it differs from ROM? | CO3 | 2 |
| e. | Realize the following function using PAL  X0= A’BC”D + A”BCD” + A”BCD + ABCD”  X1 = A”BCD” + A”BCD + ABCD  X2 = A”BC” + A”BC + AC +ABC’ | CO3 | 14 |
| **(OR)** | | | | |
| 8. | a. | Write the acronym of EEPROM. | CO3 | 1 |
| b. | List the types of PLDs. | CO3 | 1 |
| c. | Write the classification of memories. | CO3 | 2 |
| d. | Define address and word. | CO3 | 2 |
| e. | i. Write note on FPGA with neat diagram.  ii. Explain the terms volatile memory and non volatile memory. | CO3 | 10  4 |
|  | | **Compulsory**: |  |  |
| 9. | a. | What is mealy circuit? | CO3 | 1 |
| b. | List the problems involved in asynchronous circuits. | CO3 | 1 |
| c. | Define critical race. | CO3 | 2 |
| d. | What are races? | CO3 | 2 |
| e. | Give the hazard free realization for the following function  F(A,B,C) = ∑(1,3,6,7). | CO3 | 14 |