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



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

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| **Code :** | **17PH2007** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SEMICONDUCTOR LOGIC DEVICES** | **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 Binary (11111001001) to decimal. | CO1 | 4 |
| b. | Binary addition: 1100.011 + 1011.011. | CO1 | 4 |
| c. | Obtain the boolean epression for the following circuit:  C:\Users\admin\Desktop\2.png | CO2 | 4 |
| d. | State de-morgan’s law. | CO1 | 4 |
| e. | Define combinational circuit. | CO3 | 4 |
| **(OR)** | | | | |
| 2. | a. | Draw the symbol, timing diagram and truth table for the following gates:  AND, OR, NOT, Ex-OR,NOR and NAND. | CO1 | 12 |
|  | b. | Design a CLC with 4 input varibles that will produce logic 1 output, when input varibles have even numner of zeros. | CO2 | 8 |
|  |  |  |  |  |
| 3. | a. | Obtain the Boolean expression using K-Map.  f (A,B,C,D)= Σm (0,1,2,5,7,8,9,10,13,15). | CO2 | 8 |
|  | b. | Obtain the Boolean expression using K-Map.  f(A,B,C) =∏M (1,3,5,7). | CO2 | 4 |
|  | c | Obtain the Boolean expressin using map.  F (A,B,C,D)= ∏M (0,2,3,9,12,13,15). | CO2 | 8 |
| **(OR)** | | | | |

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| 4. | a. | Draw the circuit diagram, truth table and derive the K-map for half and full adder. | CO1 | 12 |
|  | b. | Obtain the Boolean expression for SOP and POS from the following table.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | DV | A | B | C | D | | 0 | 0 | 0 | 0 | 0 | | 1 | 0 | 0 | 1 | 1 | | 2 | 0 | 1 | 0 | 1 | | 3 | 0 | 1 | 1 | 0 | | 4 | 1 | 0 | 0 | 1 | | 5 | 1 | 0 | 1 | 0 | | 6 | 1 | 1 | 0 | 0 | | 7 | 1 | 1 | 1 | 1 | | CO3 | 8 |
|  |  |  |  |  |
| 5. |  | Simplify the following Boolean function by using Quine-Mcluskey method.  F(A,B,C,D) =Σm (0,2,3,6,7,8,10,12,13) | CO2 | 20 |
| **(OR)** | | | | |
| 6. | a. | Design a digital comparator with neat truth table and circuit diagram. | CO3 | 18 |
| b. | Write expansion of SOP and POS. | CO1 | 2 |
|  |  |  |  |  |
| 7. | a. | Derive the expression for 1:4 demultiplexer and draw the circuit diagram. | CO3 | 4 |
| b | Implement the following Boolean function using 8:1 Mux.  F(A,B,C,D) = ∏M (1,2,5,7,9,10,12,14) | CO3 | 8 |
|  | c | Implement the following Boolean function using 8:1 Mux (7).  F(P,Q,R,S) = Σm (0,1,3,4,8,9,15) | CO3 | 8 |
| **(OR)** | | | | |
| 8. | a. | Design a 8 bit comparactor using 7485IC. | CO4 | 5 |
| b. | Design a 4 parallel adder using Full adder. | CO4 | 5 |
| c. | Tabulate Decimal number to BCD encoder. | CO4 | 10 |
|  | | **Compulsory:** |  |  |
| 9. | a. | State the difference between latches and Flip flops. | CO5 | 4 |
| b. | Discuss in detail the different types of flip flops with a neat diagram and truth table. | CO5 | 16 |