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

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **16PH2004** | **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 octal (5411) to binary. | CO1 | 4 |
| b. | Convert decimal (294) to binary. | CO1 | 4 |
| c. | Binary addition: 1011.111 + 1111.011. | CO1 | 4 |
| d. | Binary subtraction :11.01111-10.00000. | CO1 | 4 |
| e. | Convert binary (1101101000) to hexadecimal. | CO1 | 4 |
| (OR) | | | | |
| 2. | a. | Draw the symbol, timing diagram and truth table for the following gates:  AND, OR, NOT, Ex-OR,NOR and NAND | CO3 | 12 |
| b. | Write a note on commutative law. | CO1 | 4 |
| c. | Solve: (A+B) (A+C). | CO1 | 2 |
| d. | Solve:ABCD+ABD. | CO1 | 2 |
|  |  |  |  |  |
| 3. | a. | Obtain the Boolean expression using K-Map .  f (A,B,C,D)= Σ (0,1,2,3,4,6,8,9,10,11). | CO3 | 8 |
| b. | Obtain the Boolean expression using K-Map.  f(A,B,C) =∏ (0,1,6,7) | CO3 | 4 |
| c | Obtain the Boolean expression using K-Map .  f(A,B,C,D) =∏M (0,3,4,7,8,10,12,14) + d (2,6) | CO3 | 8 |
| (OR) | | | | |
| 4. | a. | Draw the circuit diagram, truth table and derive the K-map for half and full subtractor. | CO3 | 16 |
| b | Write the Boolean expression for the following circuit  C:\Users\admin\Desktop\1.png | CO3 | 4 |
|  |  |  |  |  |
| 5. | a. | Write down the various steps involved in Quine Mcluskey method. | CO2 | 10 |
| b. | Obtain the Boolean expression for SOP and POS from the following table.  C:\Users\admin\Desktop\screen-16.30.40[09.11.2016].png | CO2 | 10 |
| (OR) | | | | |
| 6. |  | Tabulate BCD to 7 segment display with corresponding circuit diagram. | CO2 | 20 |
|  |  |  |  |  |
| 7. | a. | Design a combinational logic circuit with 4 input variables that will produce a logic 1 output when more than one input variable are logic 1. | CO2 | 10 |
| b. | Derive the expression for 4:1 Multiplexer and draw the circuit diagram. | CO2 | 5 |
| c. | Implement the following Boolean function using 8:1 Mux  F(A,B,C,D) = Σm (0,2,6,10,11,12,13) + d (3,8,14). | CO2 | 5 |
| (OR) | | | | |
| 8. | a. | Design a octal to binary encoder. | CO2 | 10 |
| b. | Derive the expression for 1:4 Demultiplexer and draw the circuit diagram. | CO2 | 5 |
| c. | Design 1:8 demultiplexer using 2 1:4 DEMUX. | CO2 | 5 |
|  | |  |  |  |
|  | | **Compulsory:** |  |  |
| 9. | a. | Difference between synchronous and asynchronous counters. | CO3 | 4 |
| b. | Discuss in detail the different types of shift registers with a neat diagram. | CO3 | 16 |