MAY 2017 / 30-05-17

QP Code :552402

(3 Hours) **[Total Marks:80**

N.B
1. Question No.1 is compulsory
2. Attempt any three question from remaining five questions
3. Assume suitable data wherever required but justify them
4. Draw appropriate waveforms wherever required

1. Solve any four **[20]**

(a) Explain Zener breakdown mechanism in Zener diode with VI characteristics.
(b) Calculate the stability factor S for the fixed bias circuit with R_B=100KΩ, Rc = 1 KΩ, V_{BE}=0.7 V and V_{CE}=6 V.
(c) What are the important features of a differential amplifier?
(d) State De Morgan's Theorem and implement EX-OR gate using NAND gates only.
(e) Convert T FF to D FF.

2. (a) Explain the working of Astable multivibtrator using IC 555 with suitable waveforms. **[10]**
(b) Design and implement one digit BCD adder using IC 7483. **[10]**

3. (a) Design a MOD-12 Asynchronous down counter. **[10]**
(b)Define r_d, g_m and μ for JFET and explain h_{oe} to obtain them from characteristics. **[10]**

4. (a) Make subtraction using two's complement method $(52)_{10}$-$(65)_{10}$ **[5]**

(b) Simplify Y=ABC +BC'D + A'BC and realize using basic gates. **[5]**

(c)Explain how OPAMP can be used as summing, scaling and averaging amplifier in inverting configuration with derivation of output voltage equation. **[10]**

5. (a) Explain the working of LCD. **[5]**

(b) Define load regulation and Line regulation of power Supply. **[5]**

(c)Write in short about ENTITY declarations in VHDL. Write VHDL program for full adder. **[10]**

6. (a) Compare schottky barrier diode and PN junction diode. **[5]**

(b) Draw circuit diagram of voltage divider bias using CE configuration and explain how it stabilizes Operating point. **[5]**

(c) Implement the following Boolean function using only one 8:1 Mux and few gates
$F=\sum m(0,1,3,4,5,7,9,10,12,13,15)$ **[5]**
(d) Convert $(101101.1101)_2$ to decimal, hexadecimal and octal form. **[5]**