EC-1862
B.Tech.(Semester-II) Exam-2018
Electronics Engg.

Time: Three Hours
Maximum Marks: 100

Note: Attempt questions from all the sections.

Section–A
(Short Answer Type Questions)
Note: Attempt any ten questions. Each question carries 4 marks. (4x10=40)

1. Simplify the following Boolean Expression:
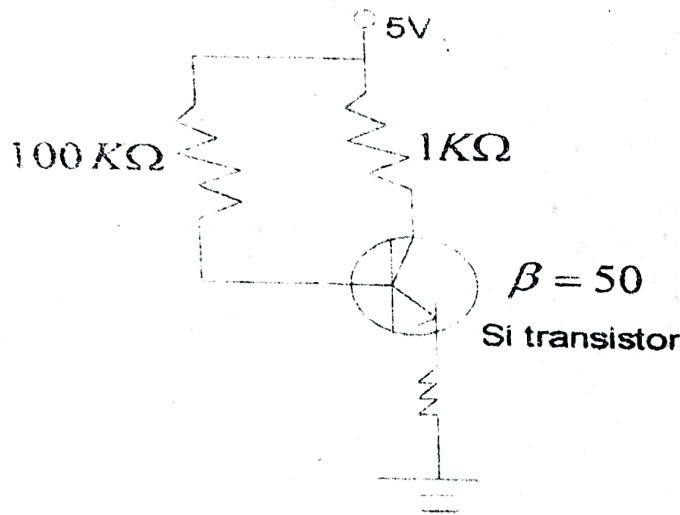$$Y = \overline{\overline{BC} + \overline{AD}(\overline{AB} + \overline{CD})}$$
$$Y = ABC + A\bar{B}C + AB\bar{C}$$

2. Explain how electrons are focused to a fine point on the screen of a CRT?

3. Explain how the V-I characteristic of p-n diode depend on temperature.

4. Distinguish between p-type and n-type semiconductor with energy band diagram.

Draw the dc load line and determine the operation point.

5V

$100\,K\Omega$

$1K\Omega$

$\beta = 50$

Si transistor

6. List the characteristic of an ideal op-Amp.

7. For a transistor working in CB configuration explain the input and o/p characteristic with diagram.

8. Explain the working of full wave bridge rectifier with circuit diagram.

9. Explain how an op-Amp can be used as inverting amplifier with circuit diagram.

10. Differentiate between avalanche and zener breakdown.

11. How the dynamic resistance r of a pn-junction diode vary with (i) Current (ii) Temperature

12. What is advantage of FET over a bipolar junction transistor?

13. Convert the following:
    (i) $(4021.25)_{10} = (---)$
    (ii) $(A6F.CD)_{16} = (---)_8^2$

14. Explain the term:
    (i)   Input offset current
    (ii) Slow rate

15. Explain:
    (i)   Potential barrier
    (ii) Depletion layer

Section –B
(Long Answer Type Questions)
Note: Attempt any three questions. Each question carries 20 marks. **(20x3=60)**

16. Explain working of op-Amp as an inverting and non inverting amplifier.

2. (a) Convert the following number:
   (i) $(1001)_8 = (\text{---})_2$
   (ii) $(2CCD)_{16} = (\ )_5$
   (iii) $(.45)_{10} = (\ )_8$
   (iv) $(345)_8 = (\ )_{10}$
   (v) $(25)x = (85)_{10}$ find x.

   (b) Write demorgan's theorem and canonical form of Boolean function.

3. A junction transistor has following parallel meter $h_{ie} = 2K$, $h_{re} = 1.6 \times 10^{-4}$, $h_{fe} = 50$ $h_{oe} = 50\mu A/V$. Determine (i) A_I, A_V, R_I, R_O of CE amplifier if load resistance is $12k\Omega$ and $Rs = 500\Omega$.

4. Differentiate between clipping and clamping with circuit diagram.

5. (a) Determine the Boolean function using k-map
   $f(ABCD) = \varepsilon m(3,4,5,7,9,13,14,15) + d(0,2,8)$
   (b) Explain voltage full wave doubles with diagram.

6. (a) Explain the working principle of a CRO. Also writes its various applications.
   (b) Explain working of half wave rectifier circuit.

EC-1862-S-350

EC-1848

B.Tech. (Semester-I) Examination–2018
Electronics Engineering

Time: Three Hours
Maximum Marks: **100**

Note: Attempt questions from all the sections.

Section-A
(Short Answer Type Questions)

Note: Attempt any ten questions. Each question carries equal marks. (4x10=40)

1. Explain with Circuit diagram full wave voltage doubles.

2. Sketch the circuit diagram of positive series clipper show in the i/p and o/p wave form.

3. What is Zener breakdown? Explain.

4. A certain transistor has $\beta=100$ if $I_C= 50$ mA find I_B.

5. Why an ordinary junction transistor is called bipolar.

6. Differentiate b/w clipper and clamper circuit.

7. Convert the following:
   - (a) $(1001)_8 = (\quad)_2$
   - (b) $(.45)_{10} = (\quad)_8$
   - (c) $(2CC^D)_{16} = (\quad)_5$

8. Explain non inverting amplifier.

9. Define Canonical form of Boolean algebra. Define SOP and POS form.

10. Differentiate b/w depletion type and Enhancement type MOSFET.

11. Write the characteristics of ideal op-amp.

12. Define Shunt. Capacitor filter with circuit diagram.

13. Sketch the logic circuit for Boolean expressions
    - (a) $(\bar{A} + \bar{B}).C$
    - (b) $\bar{A}B + \bar{C}$

14. Explain the working of Zener diode as shunt regulator.

15. Define load regulation.

Section-B
(Long Answer Type Questions)
Note: Attempt any three questions. Each question carries 20 marks. (20x3=60)

1. (a) Find the Collector current and V_{CE} voltage for given circuit.
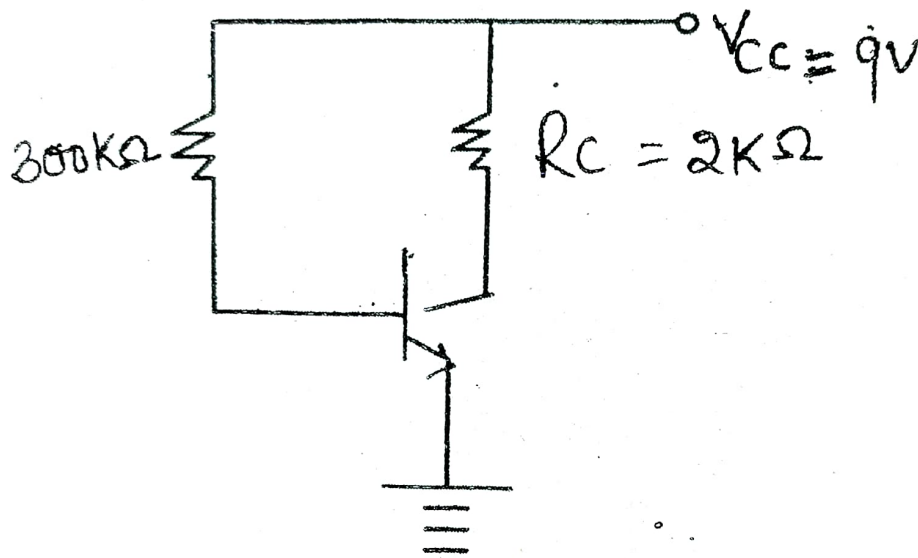
(b) Convert the number $(306)_6$ to its Equivalent decimal number.

2. A transistor connected in CE configuration has hie= 1KΩ hre=2.5x10^{-4} hfe=50, hoe=2545 and $r_s=r_L=1K\Omega$. Calculate A_I, R_I, A_V, A_{IS}, A_{VS}.

3. (a) Explain the working of CRO with block diagram.

(b)   Simplify the following expression
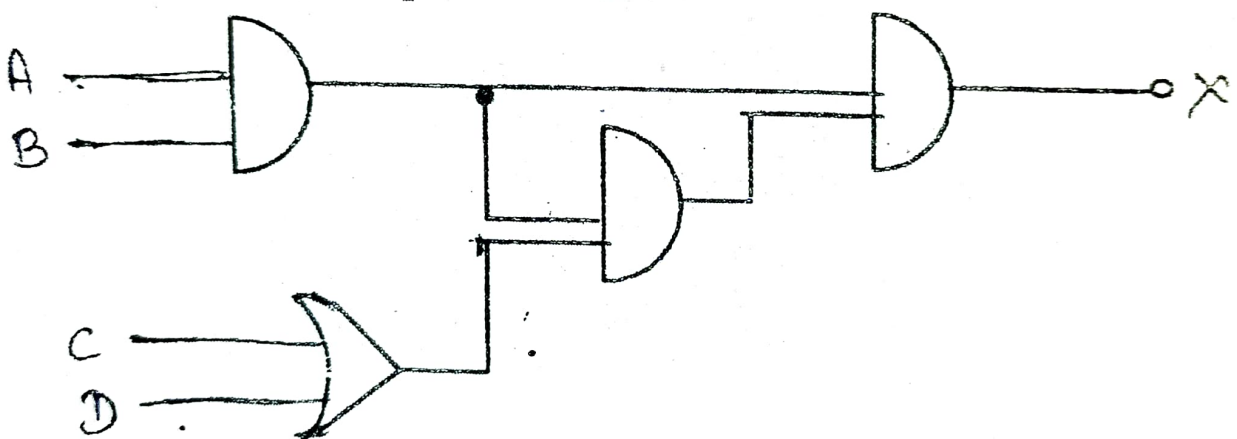(a) $Y = AB\bar{C} + A\bar{B}\bar{C} + \bar{A}\bar{C}\bar{B} + A\bar{B}$
(b) $Y = (A + BC)(D + EF)$

4.   (a)   Simplify using K-map
$W (A, B, C, D) \sum M (0, 2, 6, 11, 13, 14)$

(b)   Explain the working of op-amp as adder.

5.   Write expression of X

(b)   With Construction diagram explain the working of P-CH deplection type MOSFET.

6.   A self biased FET amplifier circuit has $R_G = 2m\Omega$ $R_D = 2.7 K\Omega$ and $R_S = 1K\Omega$. Computes V_{GS}, I_D and V_{DS}. If the FET has $I_{DSS} = 3mA$ and $V_p = 2.4v$.