Printed Pages: 02   **Sub Code: NEC101**

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B TECH
(SEM I) THEORY EXAMINATION 2017-18
ELECTRONICS ENGINEERING

Time: 3Hours   *Max. Marks: 100*

Note: Attempt all Sections. Assume missing data, if any.

SECTION A

**1.**   **Attempt *all* questions in brief.**   **10 x 2 = 20**

    a)   Explain PN junction works as a rectifier?

    b)   Breakdown voltage of a zener diode is 10V. It can dissipate a maximum power of 350 mW. Determine the maximum current the diode can handle?

    c)   Why is collector wider than emitter and base?

    d)   What is the relation among α, β and γ?

    e)   Define CMRR and PSRR?

    f)   What is the basic principle of CRT?

    g)   In N-Channel JFET, If I_{DSS} =8.7 mA , V_P = -3Vand $V_{GS\ off}$ = -1V find the value of I_D?

    h)   What is the need of Modulation?

    i)   What are the applications of CRO?

    j)   For a given op-amp, CMRR = 10^4 and A_d= 10^5, find its common mode gain?

SECTION B

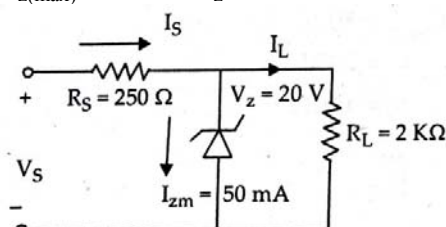**2.**   **Attempt any *three* of the following:**   **10 x 3 = 30**

a) For the clamping circuit shown in figure 1, sketch V_0 ?
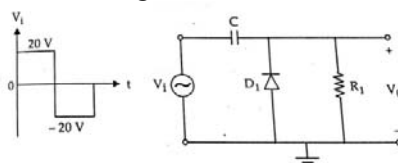
Figure 1

b) Determine the range of values of V_s for the zener diode to remain in "ON" state. Given for Zener diode V_z = 20V, $I_{z(max)}$ = 50mA R_z=0Ω.

Figure 2

c) From the circuit shown in figure 3, determine: (i) R_C (ii) R_E (iii) R_B (iv) V_{CE} (v) V_B
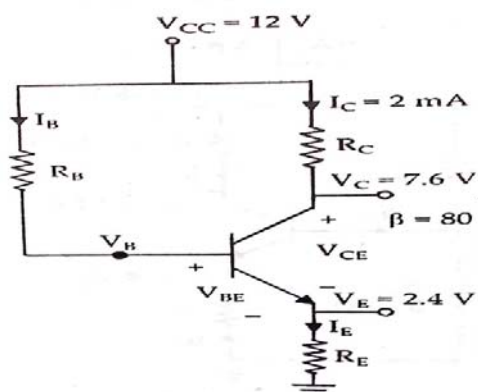

Figure 3

d) Draw the circuit of transistor in the CE configuration. Sketch the output characteristic. Indicate the Active, saturation region and cut-off region. Explain each region in detail.

e) Explain the different parameter of JFET?

(i) Static drain resistance (ii) AC drain resistance (iii) Transconductance (iv) Input Capacitance (v) Input Resistance

SECTION C

3. Attempt any _one_ part of the following: **10 x 1 = 10**

a) Explain the operation of a tunnel diode. Draw the V-I characteristic of the diode and list the application of tunnel diode.

b) (i) Explain the working of diode as a shunt regulator?

(ii) Explain the difference between LCD and LED?

4. Attempt any _one_ part of the following: **10 x 1 = 10**

(a) Derive the expression for voltage gain and current gain in an emitter follower configuration?

(b) (i) Explain the function of coupling capacitor and bypass capacitor?

(ii) Explain how an FET can be used as a voltage controlled resistor?

5. Attempt any _one_ part of the following: **10 x 1 = 10**

a) For the op-amp shown in figure 4, find the values of R_1 and R_2 for the output to be $V_0 = -5V_a + 3V_b$
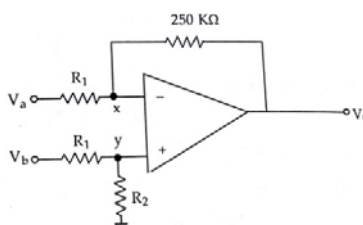

Figure 4

(b) **(i)** Explain the working of Integrator with neat sketch?

(ii) Write the short note on Inverting and non-inverting op-amp?

6. **Attempt any *one* part of the following:** **10 x 1 = 10**

(a) Explain briefly the working principle of a digital multi meter with the aid of a block diagram?

(b) (i) Explain the function of ramp type of digital voltmeter?

(ii) Sketch a Cathode Ray Tube used in a CRO? What are its main Parts?

7. **Attempt any *one* part of the following:** **10 x 1 = 10**

a) An FM signal has a resting frequency of 105 MHz and highest frequency of 105.03 MHz when modulated by a signal of frequency 5 KHz. Determine (i) Frequency deviation (ii) carrier swing (iii) modulation index (iv)percent modulation (v) lowest frequency reached by FM wave.

b) (i) Explain frequency measurement using Lissajous pattern.

(ii) What is the difference between AM and FM?