

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3301

Roll No.

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B.Tech.

(SEM. I) ODD SEMESTER THEORY EXAMINATION 2012-13

ELECTRONICS ENGINEERING

Time : 3 Hours

Total Marks : 100

Note : All sections are compulsory.

SECTION—A

1. All parts are compulsory. All questions carry equal marks.

(10×2=20)

- Draw and explain the characteristics of Zener diode.
- What is the PIV for half wave and full wave center tapped transformer rectifier ?
- Describe the different resistances of a p-n junction diode.
- What are the stability factors in BJT configurations ?
- Write the constructional difference(s) between depletion type MOSFET and enhancement type MOSFET.
- Write down the names of universal gates and explain why they are called so ?
- Which configuration of BJT is used for impedance matching and why ?
- Write the characteristics of an ideal Op-Amp.
- Write down the application of Lissajous figures.
- Write-down the types of Digital multimeter.

SECTION—B

2. Attempt any **three** parts of the following. All questions carry equal marks. **(10×3=30)**

(a) What is voltage multiplier? Draw and explain the voltage doubler circuits. Determine V_{01} , V_{02} and I for the network of Figure 1.

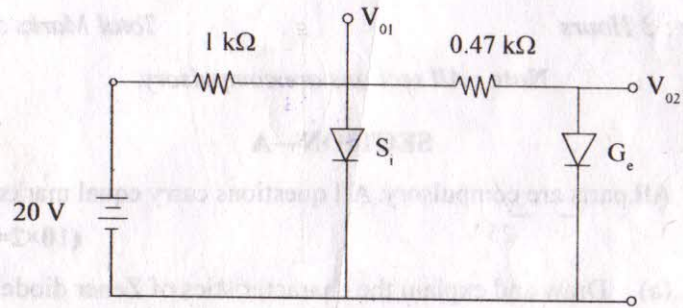


Figure 1

(b) Discuss the BJT Emitter Bias circuit and write its advantage over BJT Fixed bias circuit. Also define bias stabilization and stability factors.

(c) Draw the construction and explain the working of p-channel JFET. Also draw the characteristic curve and transfer characteristic.

(d) What are the meaning of accuracy, precision and resolution of an instrument? Draw and explain the block diagram of a digital multimeter.

SECTION—C

Note : All questions are compulsory. All questions carry equal marks. **(10×5=50)**

3. Attempt any **two** parts of the following. All questions carry equal marks :

(a) Sketch i_R and v_o for the network of Figure 2 for the input shown :

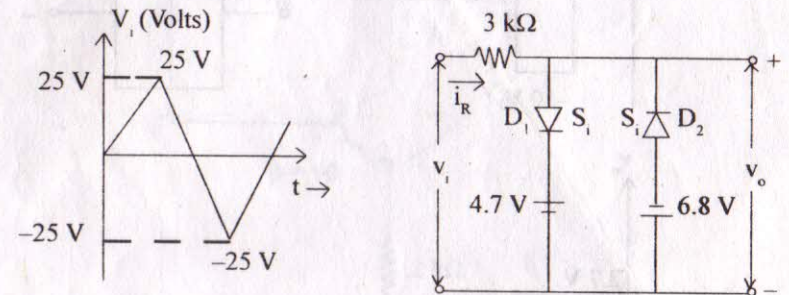


Figure 2

(b) Calculate the values of R_s and R_L to maintain V_L at 12 V for I_L to vary from 0 to 200 mA (Refer Figure 3). Also find V_z and $P_{z(max)}$.

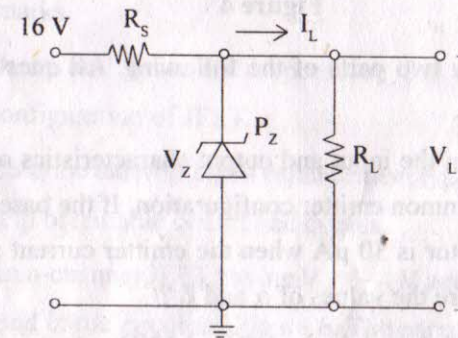


Figure 3

- (c) Design a clamper to perform the function indicated in Figure 4.

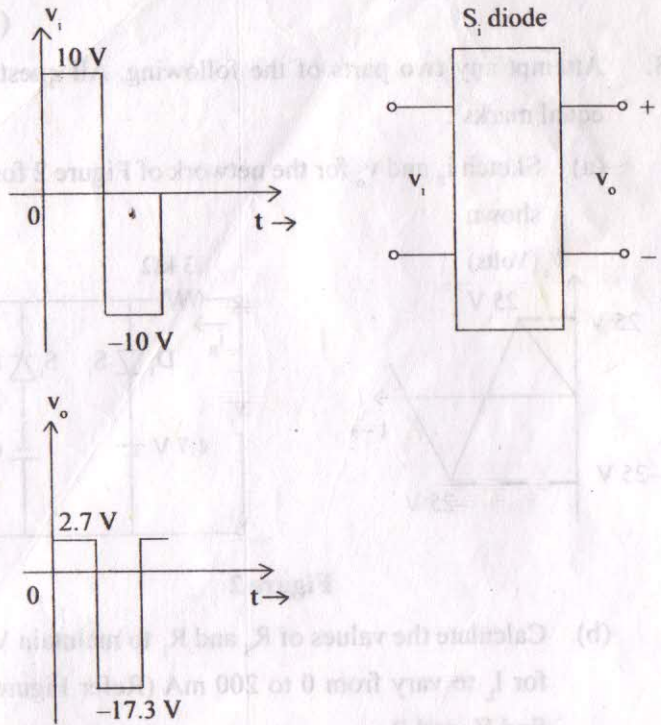


Figure 4

4. Attempt any **two** parts of the following. All questions carry equal marks.
- Explain the input and output characteristics of a BJT in the common emitter configuration. If the base current in transistor is $30 \mu\text{A}$ when the emitter current is 7.2 mA , what are the values of α and β ?
 - Draw and explain the OR and AND gate using BJT.

- (c) Determine the levels of I_C and V_{CE} for the net, Figure 5.

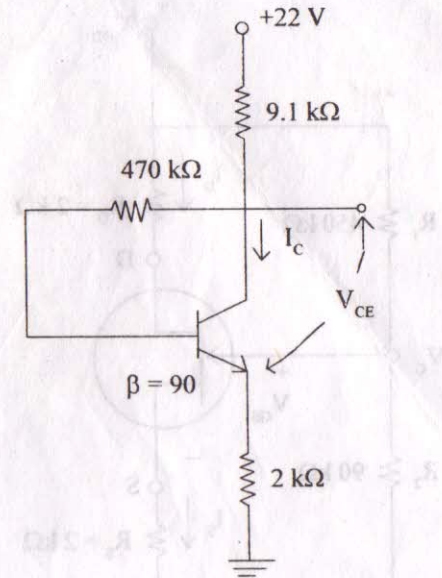


Figure 5

5. Attempt any **two** parts of the following. All questions carry equal marks.
- Draw and write the expression for voltage divider configuration of JFET.
 - Describe the working of enhancement type MOSFET with help of suitable circuit and curves.
 - An n-channel JFET having $V_p = -4 \text{ V}$ and $I_{DSS} = 10 \text{ mA}$ is used in the circuit of Figure 6. The parameter values are

$V_{DD} = 18 \text{ V}$, $R_S = 2 \text{ k Ohms}$, $R_1 = 450 \text{ k Ohms}$, and $R_2 = 90 \text{ k Ohms}$. Determine I_D and I_{DS} .

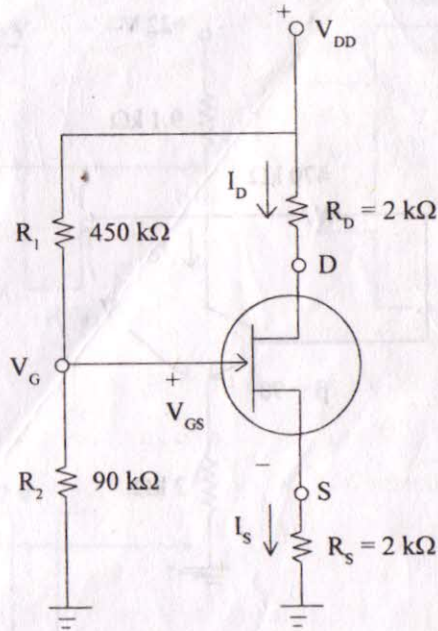


Figure 6

6. Attempt any **two** parts of the following. All questions carry equal marks.

(a) (i) Subtract by using r 's complement method where r is the base of the number :

$$(564.90)_{10} \text{ and } (986.87)_{10} \quad (1101.11)_2 \text{ and } (101.011)_2$$

(ii) Convert the following :

$$(4325)_{10} = ()_7 \quad (7841)_{10} = ()_{16} \quad (23.67)_{10} = ()_2$$

(b) Minimize the following using K-map technique. Also, implement the simplified function using NOR gates only :

$$f(A, B, C, D) = \Sigma m(0, 1, 2, 9, 11, 15) + \Sigma d(8, 10, 14)$$

(c) Attempt followings :

(i) Design a circuit using only NAND gates for following Boolean expression :

$$Y = ABC' + BCD' + CD.$$

(ii) Convert the following into POS format :

$$F(A, B, C, D) = ABCD + A'CB + AB'C.$$

7. Attempt any **two** parts of the following. All questions carry equal marks.

(a) Explain the following :

(i) Series and parallel clippers

(ii) Horizontal and vertical plates of CRT.

(b) Describe the method of measurement of frequency, amplitude and phase using CRO.

(c) What is voltage follower ? Derive the expression of CMRR.