

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

PAPER ID : 199211

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--

B.Tech.

(SEM. II) THEORY EXAMINATION 2013-14

ELECTRONICS ENGG*Time : 3 Hours**Total Marks : 100***Note :- Attempt all Sections.****SECTION-A**

1. All parts are compulsory. Write short answers by giving proper reasons. : **(2×10=20)**
- Calculate the dynamic forward and reverse resistance of a PN junction diode when the applied voltage is 0.25 V at $T = 300^\circ \text{K}$ given $I_s = 2 \mu\text{A}$.
 - Distinguish between avalanche and zener mechanisms.
 - Draw the block diagram of unregulated Power Supply.
 - Establish the relationship between I_{CBO} and I_{CEO} .
 - Draw the transfer and output characteristic of Tunnel Diode.
 - Enlist the difference between JFET and MOSFET.
 - An operational Amplifier has a differential gain of 103 and a CMRR of 100, input voltages are 120 μV and 80 μV . Determine the output voltage.
 - The BJT circuit has $I_C = 10 \text{ mA}$ and $\alpha = 0.98$. Determine the value of I_E .
 - In JFET $I_{DSS} = 8\text{mA}$, $V_p = -4\text{V}$ biased at $V_{GS} = -1.8\text{V}$. Determine the value g_m .
 - What are Lissajous figure ?

SECTION-B

2. Attempt any **three** parts of the following : **(10×3=30)**

- (a) (i) Draw and explain the working of Bridge rectifier with input and output waveforms. Calculate efficiency and ripple factor for the same.
- (ii) For the network shown in Fig. 1, determine the output voltage.

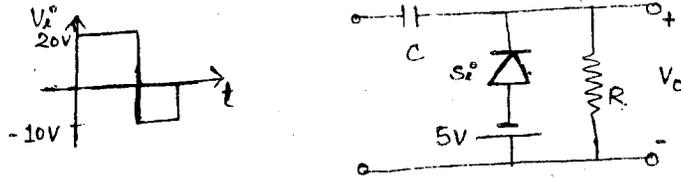


Figure 1

- (b) (i) With proper circuit diagram, draw the Base curve and collector curves of n-p-n transistor in C-E configuration.
- (ii) Determine I_{CQ} and V_{CEQ} for the network shown in Fig. 2.

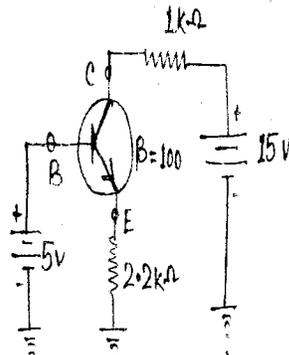


Figure 2

- (c) (i) With suitable ckt. diagram describe the working of n-channel JFET with drain and transfer curves.
- (ii) Draw the dc load line and determine V_G , I_{DQ} , V_{GSQ} for the network shown in Fig. 3.

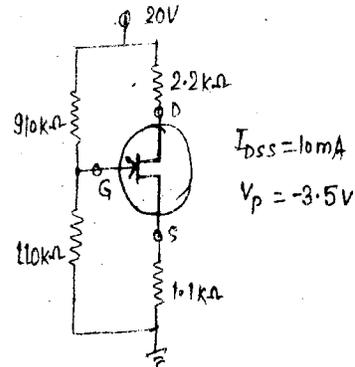


Figure 3

- (d) (i) How OP-Amp acts as a differentiator ? Derive its output voltage expression.
- (ii) Determine the output voltage for the network shown in Fig. 4.

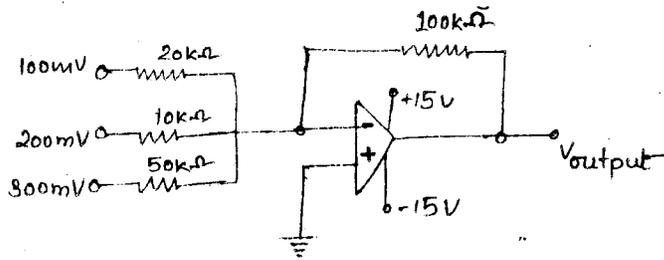


Figure 4

- (e) (i) Write short note on digital multimeter with proper block diagram.
- (ii) For the given zener diode network shown in Fig. 5 determine V_L , V_R , I_Z and I_R .

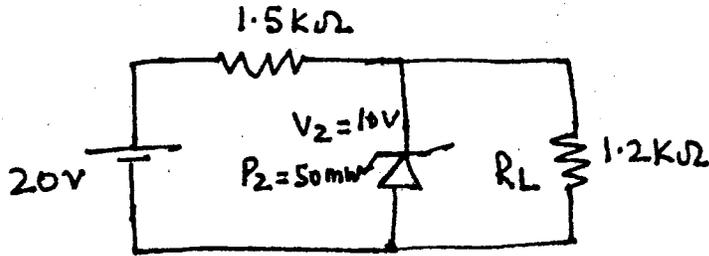


Figure 5

SECTION-C

Note : Attempt all questions of this section. (10×5=50)

3. Attempt any two parts of the following :

(a) Determine the output voltage for given network in Fig. 6.

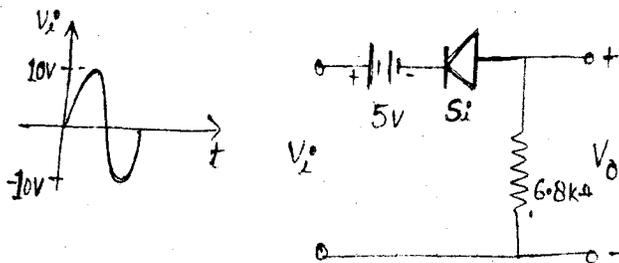


Figure 6

- (b) Design a clamper to perform the function indicated in following Fig. 7.

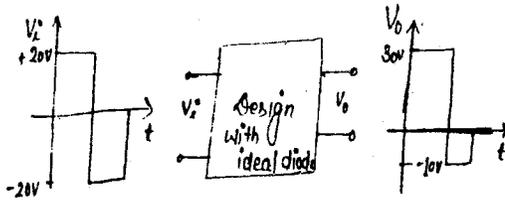


Figure 7

- (c) Explain Schottky diode and varicap with their applications.

4. Attempt any two parts of the following :

- (a) Draw and explain the a.c. equivalent circuit of voltage divider Bias amplifier using re model.
 (b) Determine the voltage Gain of emitter follower in Fig. 8.

If $\beta = 150$, what is a.c. input voltage ?

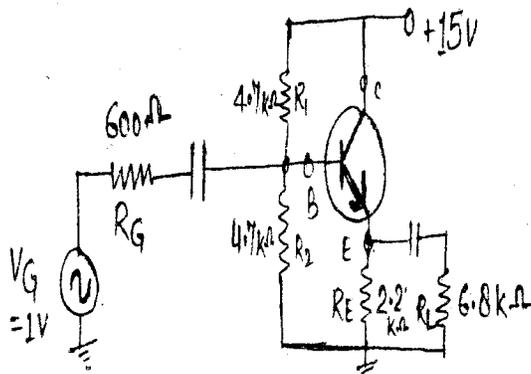


Figure 8

- (c) Calculate the voltage Gain of VDB amplifier shown in Fig. 9.

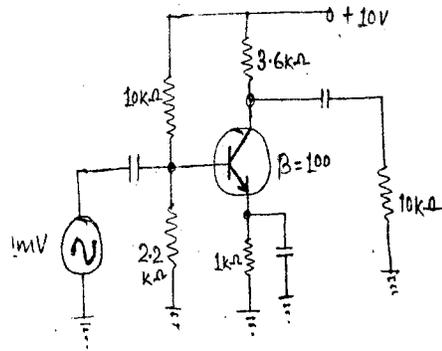


Figure 9

5. Attempt any two parts of the following :
- With proper circuit diagram draw and explain the drain and transfer characteristic curve for N-Channel JFET.

Show that $\epsilon_m = \frac{-2}{V_p} \sqrt{I_{DSS} I_{DS}}$

- For the network shown in Fig.10, calculate V_G, V_{GS}, I_D, V_{DS} and V_S .

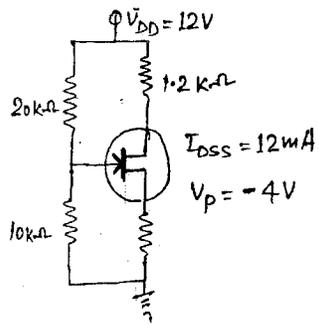


Figure 10

(c) Determine the output voltage of following network shown in

Fig. 11. having $V_{GS(off)} = -2V$, $I_{DSS} = 4mA$ and $g_{mo} = 3000 \mu S$

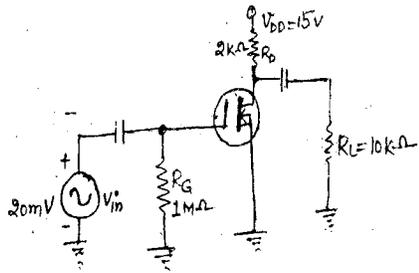


Figure 11

6. Attempt any two parts of the following :

- (a) Define CMRR, Slew Rate and concept of virtual ground in Op-AMP.
- (b) For the network shown in Fig. 12., determine the output voltage.

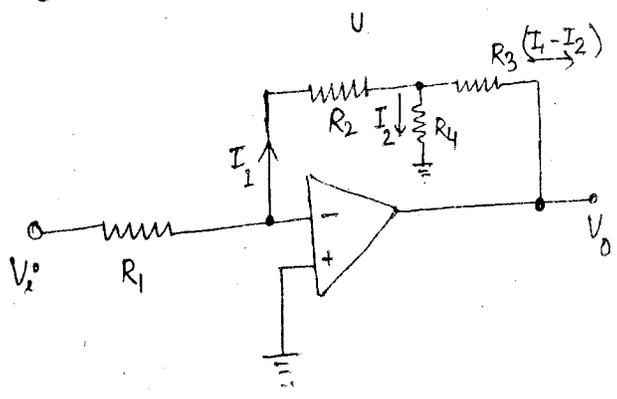


Figure 12