

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

Paper ID : 131101

Roll No.

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B. Tech.

(SEM. I) THEORY EXAMINATION, 2015-16

ELECTRONICS ENGINEERING

[Time:6x3=18 hours]

[Total Marks : 100]

Section - A

1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (2x10=20)
 - (a) Explain the effect of temperature on conductivity of a semiconductor.
 - (b) Define CMRR, slew rate of OPAMP.
 - (c) A 320W carrier is simultaneously modulated by two audio waves with modulation % of 45 and 60 respectively. What is the side band power radiated?
 - (d) Define signal. Name various types of signal.
 - (e) Why Si is preferred over Ge for manufacturing of electronics devices.

- (f) In JFET $I_{DSS} = 8\text{mA}$, $V_p = -4\text{V}$ biased at $V_{GS} = -1.8\text{V}$. Determine the value of g_m .
- (g) Define OP-AMP and draw its block diagram.
- (h) Explain FET as Voltage Variable Resistor (VVR).
- (i) Explain with proper reason the use of Emitter Follower.
- (j) Define Depletion layer of PN junction diode.

Section - B

Attempt any five questions from this section : (10x5=50)

2. (a) Determine V_o and draw the output waveform of the given network of fig. 1

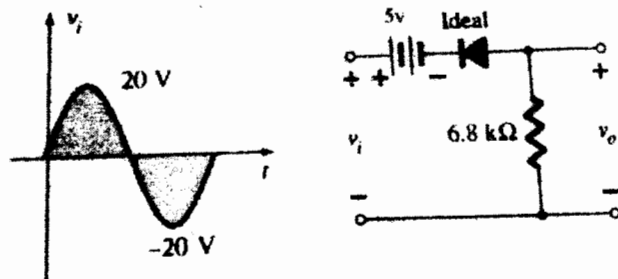


Figure 1

- (b) For the network of fig. 2 determine the range of V_i that will maintain V_L at 8V and not exceed the maximum power rating of the Zener diode.

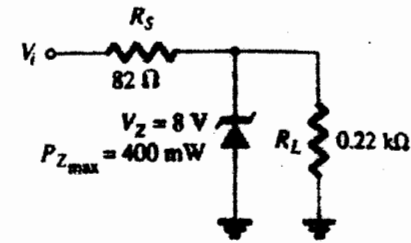


Figure 2

3. (a) Sketch v_o , V_{DC} for the network of fig. 3 and determine the peak inverse voltage of each diode.

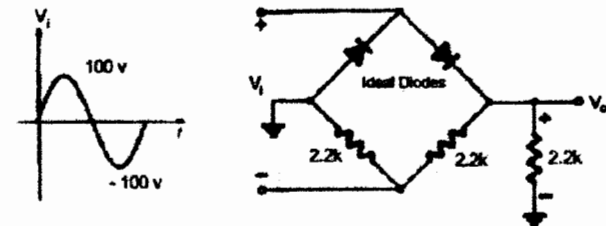


Figure 3

- (b) Sketch V_o for each network of fig. 4 for the input shown.

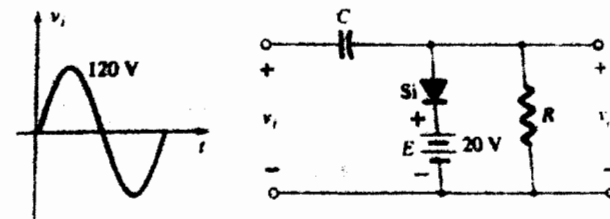


Figure 4

4. Explain with the help of necessary diagram :
- Inverting Amplifier
 - Integrator
 - Differential amplifier in two mode of operation
5. Define Modulation. Derive the relation of total power of AM waves.
6. For the voltage divider configuration of fig.5 determine r_e , A_v , Z_{in} and Z_o .

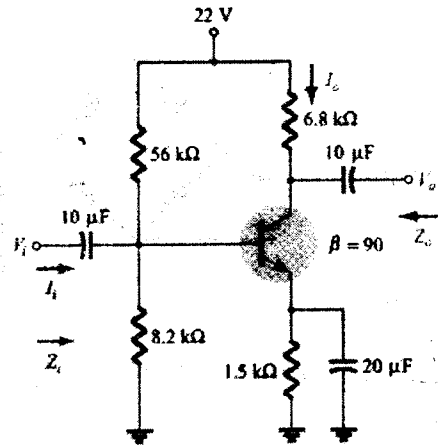


Figure 5

7. (a) Determine the output voltage of an op-amp for input voltages of $V_{i1} = 200V$ and $V_{i2} = 140V$. The amplifier has a differential gain of $Ad = 6000$ and the value of CMRR is :
- 200
 - 10^5

- (b) Find out the voltage V_2 and V_3 of the given network of fig.6.

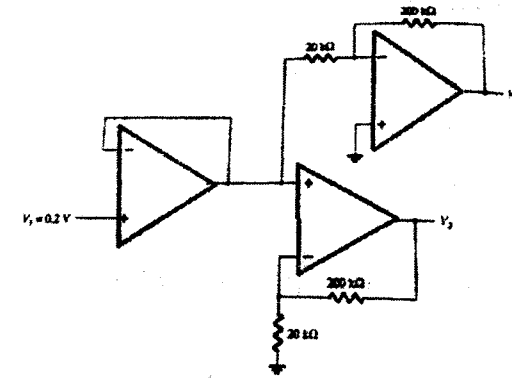


Figure 6

8. With the help of neat block diagram explain the working of a CRO.
9. Explain with the help of neat diagram working and characteristics curve of Ramp type digital voltmeter.

Section - C

Attempt **any two** questions from this section : (15x2=30)

10. (a) Explain working and characteristics of Tunnel diode with the help of neat diagram.
- (b) Describe with the help of circuit diagram working of voltage tripler.
- (c) Differentiate between Half wave and Full wave rectifiers.

11. (a) Explain construction and working and characteristics of P channel Enhancement MOSFET.
- (b) Draw and explain the input and output characteristics of Common Emitter configuration.
- (c) For an input of $V_i = 50\text{mV}$ in the mcircuit of fig. 7, determine the maximum frequency that may be used. The op-amp slew rate $SR = 0.4\text{ V/s}$.

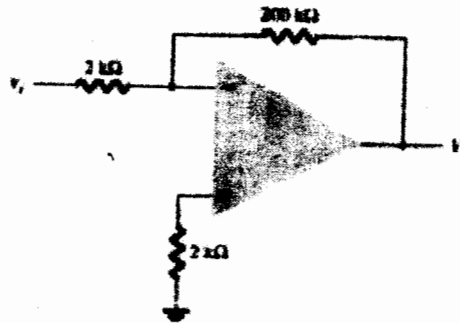


Figure 7

12. Explain the need of modulation in communication system.
- (a) A 460 watt carrier is modulated to a depth of 65 percent. Calculate the total power in the modulated wave.

- (b) Determine Z_i , Z_o and A_v for the network of fig. 8
 $I_{DSS} = 12\text{ mA}$, $V_p = -6\text{ V}$, and $Y_{os} = 40\text{ micro Siemen}$.

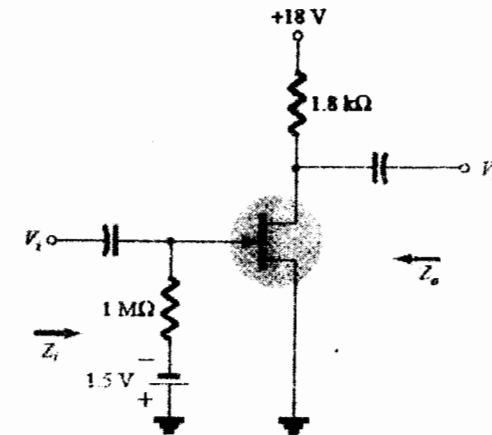


Figure 8

—X—