Printed Pages: 7 | 1261 | NEC-101

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

Paper ID : 131101 | Roll No. | | | | | | | | | |

B. Tech.

(SEM. I) THEORY EXAMINATION, 2015-16

ELECTRONICS ENGINEERIING

[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} = 8mA, V_P = –4V biased at V_{GS} = – 1.8V. 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

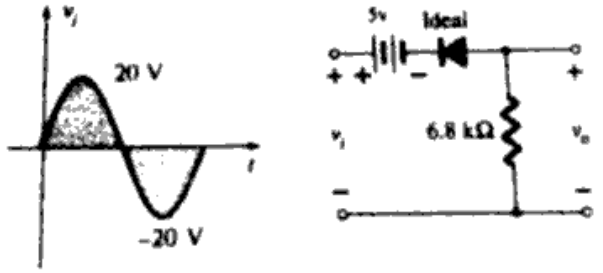

Figure 1

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

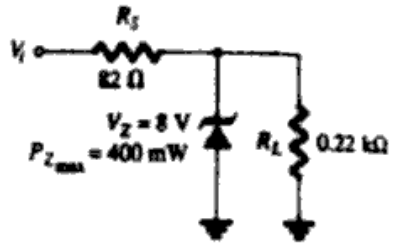

Figure 2

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

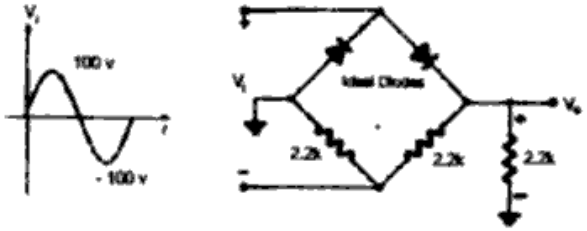

Figure 3

(b) Sketch V_0 for each network of fig. 4 for the input shown.

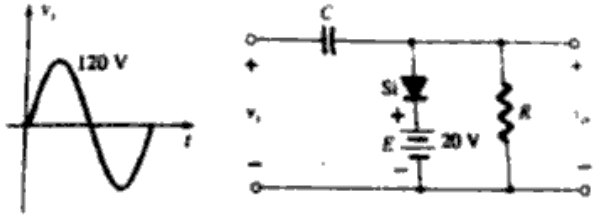

Figure 4

4. Explain with the help of necesary diagram :

(a) Inverting Amplifier

(b) Integrator

(c) 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_0.

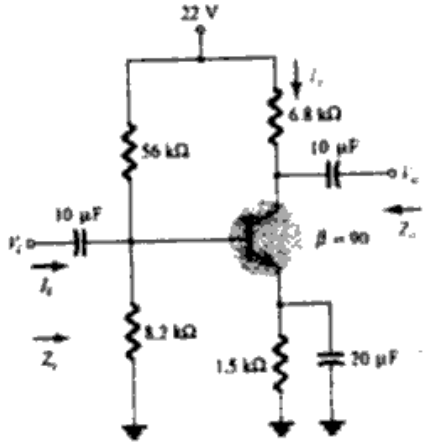

Figure 5

7. (a) Determine the output voltage of an op-amp for input voltages of Vi_1 = 200V and Vi_2 = 140V. The amplifier has a differential gain of Ad = 6000 and the value of CMRR is :

(i) 200 (ii) 10^5

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

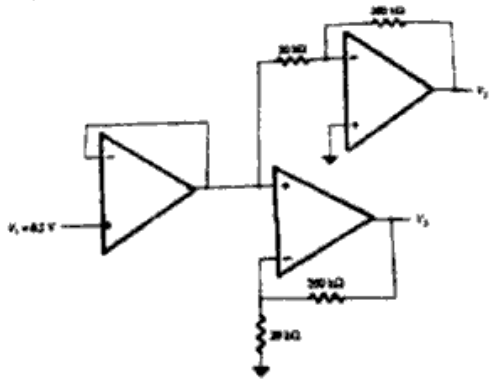

Figure 6

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 = 50mV in the mcircuit of fig. 7, determine the maximum frequency that may be used. The op-amp slew rate SR = 0.4 V/s.

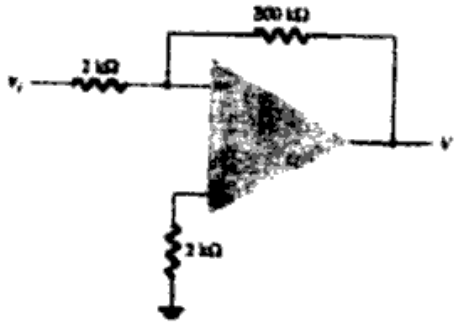

Figure 7

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 Zi, Zo and *Av* for the network of fig. 8 if I_{DSS} = 12 mA, V_P = -6 V, and Y_{OS} = 40 micro Siemen.

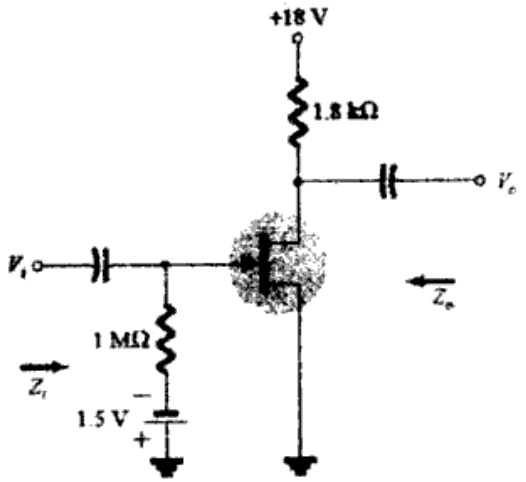

Figure 8

—X—