

B.TECH.
THEORY EXAMINATION (SEM-II) 2016-17
ELECTRONICS ENGINEERING

Time : 3 Hours

Max. Marks : 100

Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.

SECTION – A

1. **Explain the following:** **10 x 2 = 20**
- (a) Differentiate between N-type and P-type semiconductor.
 - (b) Give all the Equivalent /Approximation circuits of a Diode.
 - (c) Find the barrier potential of a silicon diode at junction temperature of 75°C and 10°C. Assume a barrier potential of 0.7 V at an ambient temperature of 25°C.
 - (d) What is a Varactor Diode, give its application also.
 - (e) What is Schottky Diode, give its application also.
 - (f) Differentiate between Multi meter and CRO.
 - (g) Determine β_{dc} and I_{CBO} , if $I_E = 5 \text{ mA}$, $I_C = 4.95 \text{ mA}$, $I_{CEO} = 200\mu\text{A}$.
 - (h) Differentiate between Depletion and Enhancement type MOSFET.
 - (i) The Op-Amp has a Slew Rate of 10 V/ μsec . What is the power bandwidth for a peak output voltage of 5 V.
 - (j) Define Modulation Index.

SECTION – B

2. **Attempt any five of the following questions:** **5 x 10 = 50**
- (a) (i) Draw & explain the V-I characteristic of a P-N junction diode. Also describe the effect of temperature on the V-I characteristic of a P-N junction diode.
(ii) For a Zener Voltage regulator, determine the range of R_L and I_L that will result in V_O being maintained at 10V. Given $V_{in} = 50\text{V}$, $R = 1\text{K}\Omega$, $I_{ZM} = 32\text{mA}$.
 - (b) (i) Differentiate between Clipper and Clamper circuit.
(ii) Explain the function of the circuit shown in Fig. 2b(ii). and draw the output waveform.
 - (c) (i) Describe the construction of a NPN transistor. Define α and β with respect to BJT and derive the relationship between them.
(ii) Refer the information appearing in Fig. 2c(ii). Determine I_C , V_E , V_C , I_B , β & V_{CE} .

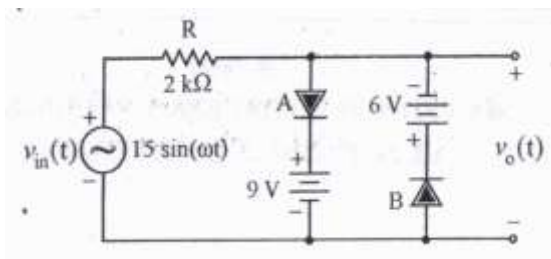


Fig. 2b(ii)

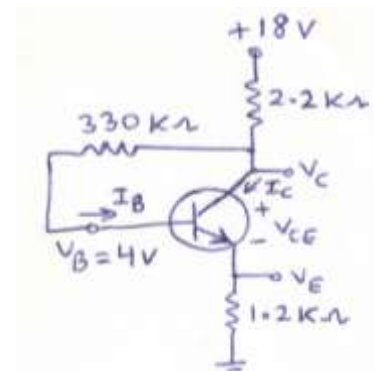


Fig. 2c(ii)

- (d) Explain the construction, working and characteristics of MOSFET.
- (e) (i) Draw the circuit of a subtractor circuit using op-amp and explain its working by obtaining output expression.

- (ii) Draw the circuit of Integrator using op-amp and obtain expression for output.
- (f) Describe the working of Digital Voltmeter and Digital Multi Meter giving their block diagram.
- (g) Describe the working of CRO giving its block diagram
- (h) Describe communication system with the help of its block diagram.

SECTION – C

Attempt any two of the following questions:

2 x 15 = 30

3. (a) List up the characteristics of an Op- amp. Also give its symbol and equivalent circuit. For a particular Op-Amp the input offset current is 10 nA while input bias current is 40 nA. Calculate the values of two input bias currents.
- (b) In a full wave rectifier the load resistance is $2\text{ K } \Omega$, $r_f = 400\text{ } \Omega$. Voltage applied to each diode is $240\text{Sin}\omega t$. Find
- (i) Peak value of current i.e. I_m
 - (ii) DC value of current i.e I_{dc}
 - (iii) RMS value of current i.e. I_{rms}
 - (iv) Efficiency
 - (v) Ripple Factor.
4. (a) Define the following:
- (i) Slew Rate
 - (ii) Electron Volt
 - (iii) Mobility
 - (iv) Ripple Factor
 - (v) CMRR
 - (vi) Pinch Off Voltage
 - (vi) T.U.F.
- (b) What is modulation? Give the need of modulation. Differentiate AM & FM.
5. (a) Describe the working of voltage multiplier circuit.
- (b) Describe Amplitude Modulation by obtaining its expression. A 560 watt carrier is modulated to a depth of 75%. Calculate the total power in the modulated wave.