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**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 75oC 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 $ß_{dc}$ and $I_{CBO}$, if $I_E$ = 5 mA, $I_C$ = 4.95 mA, $I_{CEO}$ = 200µA.

**(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 Vin = 50V, R = 1K Ω, IZM = 32mA.

**(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 & $V_{CE}$.

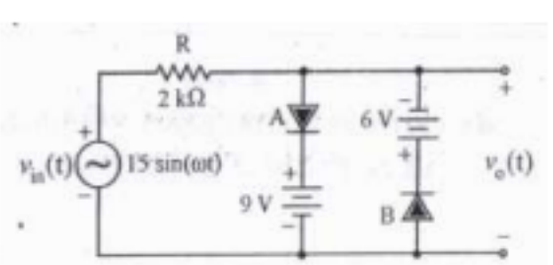



Fig. 2b(ii)

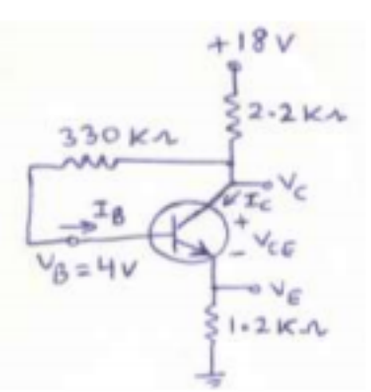



Fig. 2c(ii)

**(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.

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(e) Draw the circuit of Integrator using op-amp and obtain expression for output.

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**(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 K Ω, $r_f$ = 400 Ω. Voltage applied to each diode is 240Sinωt. 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.

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