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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}.

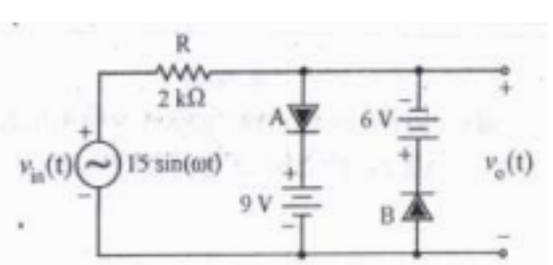


Fig. 2b(ii)

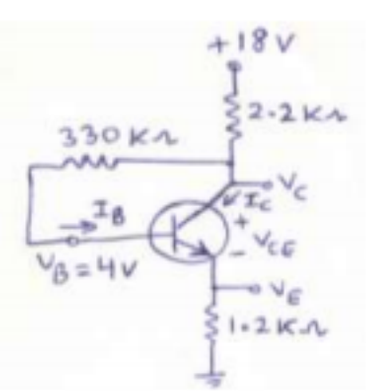


Fig. 2c(ii)

(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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