Sub Code: REC101

Paper Id: 130101 Roll No: | | | | | | | | | | | | | |

B.TECH.
(SEM I) THEORY EXAMINATION 2019-20
Electronics Engg

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

(a) What do you mean by Doping. Describe its need.
(b) Give all the Equivalent /Approximation circuits of a Diode.
(c) Determine $ß_{dc}$ and I_{CBO}, if I_E = 5 mA, I_C = 4.95 mA, I_{CEO} = 200µA.
(d) Define Threshold Voltage for an E-MOSFET.
(e) Define Slew Rate and CMRR.
(f) Define Modulation. List need of modulation.
(g) A 320W carrier is simultaneously modulated by two audio waves with modulation % of 45 and 60 respectively. What is the sideband power radiated?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a) Differentiate between Clipper and Clamper circuit. Draw the output waveform for the circuit of **Fig.2.1**

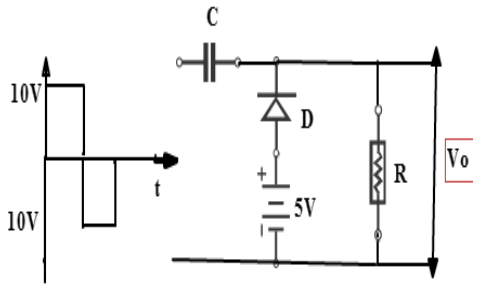

Fig.2.1

b) What is a Transistor? Describe the construction of a NPN transistor. Define α and β with respect to BJT and derive the relationship between them. Describe input and output characteristics for NPN transistor in CE configuration. Label all variables and also indicate the regions.
c) What is an Operational Amplifier? Describe its block diagram. Give its equivalent circuit and voltage transfer characteristics. List its characteristics.
d) What is Cathode Ray Oscilloscope? Describe its working with the help of block diagram.
e) Explain the elements of communication system with the help of block diagram.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) 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.
(b) For a Zener Voltage regulator, determine the range of V_{in} that will maintain the Zener diode in the ON state. Take R_L= 1.2 K Ω, R = 220 Ω, V_Z = 20V, I_{ZM} = 60mA.

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4. Attempt any *one* part of the following: 7 x 1 = 7

(a) Describe the construction, working and characteristic of enhancement type MOSFET.

(b) In a full wave rectifier the load resistance is 2 K Ω, r_f = 400 Ω.Voltage applied to each diode is 240Sinwt. 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

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) Draw the circuit of Integrator using OP Amp and explain its working. Also obtain expression for its output.

(b) Draw the circuit of Subtractor using OP Amp and explain its working. Also obtain expression for its output.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) Write the short note on DSO .Also compare DSO with analog Oscilloscope.

(b) What is Digital Multimeter. Describe its working with the help of block diagram.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a) Describe AM modulation and demodulation technique.

(b) An audio frequency signal 5 Sin 2 Π x 500 t is used to amplitude modudate a carrier of 25 Sin 2 Π x 10^5 t . Calculate:

(i) Modulation Index (ii) Sideband Frequency (iii) Amplitude of each sideband

(iv) Bandwidth required (v) Total power delivered to the load of 1 K Ω

(vi) Transmission Efficiency