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B. E. (Third Semester) Examination, April-May 2021

(New Scheme)

(IT Engg. Branch)

BASIC ELECTRONICS & NETWORK THEORY

Time Allowed : Three hours

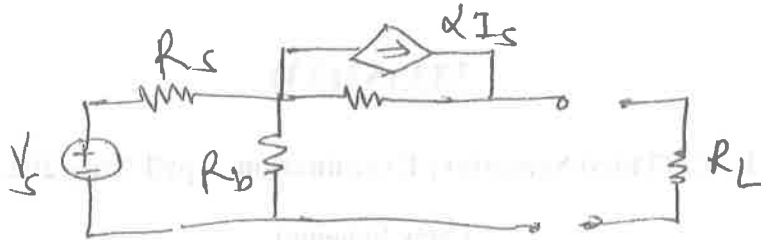*Maximum Marks : 80*

Minimum Pass Marks : 28

Note : All questions are compulsory and carry equal marks. Part (a) is compulsory from each question and attempt any two parts from (b), (c) and (d).

Unit-I

1. (a) What are the different passive & active circuit elements?   2

    (b) Explain superposition theorem with example.   7

(c) Determine Thevenin's equivalent circuit for the given network.　7

(d) Explain Thevenin's theorem with example.　7

Unit-II

2. (a) What is an Ideal Diode?　2

(b) Explain the working of full-wave rectifier and find expression for :　7

    (i) Transformer utilization factor

    (ii) Efficiency

(c) Write down the diode equation and explain the temperature dependence of diode characteristics.　7

Or

Explain the forward & reverse characteristics of PN junction diode.

(d) Prove that zener diode act as voltage regulator and draw the VI characteristics of zener diode.　7

Unit-III

3. (a) What do you mean by reach through/base width modulation?　2

(b) Draw and explain characteristics of common-emitter configuration of transistor.　7

(c) Draw the Ebers-Moll model of transistor and explain it.　7

(d) What do you mean by maximum voltage rating of transistor?　7

Unit-IV

4. (a) Why it is required to bias transistor?　2

(b) Explain collector to box bias circuit and find expression for stability factor (s).　7

(c) Explain the factors which affect the collector current and responsible for shifting of operating point with respect to temperature.　7

(d) Prove that "The transistor act as switch".   7

Unit-V

5. (a) Give the comparison of JFET over BJT.   2

   (b) What is JFET? Explain the drain and transfer charac-
teristics of JFET [N-type].   7

   (c) Explain the working of depletion type MOSFET
with characteristics.   7

   (d) Prove that :

$$g_m = g_{m_0} \left(1 - \frac{V_{GS}}{V_P} \right)$$

where $g_{m_0} = \frac{-2 I_{DSS}}{V_P}$.   7