Code No.: EC404PC | R20 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–B.TECH–II–Semester End Examinations (Regular) - August- 2023
ELECTRONIC CIRCUIT ANALYSIS
(ECE)

[Time: 3 Hours] **[Max. Marks: 70]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(20 Marks)**

1. a) Draw the circuit diagram of Darlington pair. [2M]
   b) Prove that $h_{fe}=g_m.r_{b'e}$. [2M]
   c) Draw the voltage shunt feedback amplifier, express its gain. [2M]
   d) Show that bandwidth increases with negative feedback. [2M]
   e) State the condition for Barkhausen criteria for sustainable oscillations. [2M]
   f) Compare RC type Oscillators with LC type. [2M]
   g) Define crossover distortion. [2M]
   h) What is Q-factor and write the expression for Q factor. [2M]
   i) Write the applications of monostable multivibrators. [2M]
   j) State the Miller's Theorem. [2M]

PART-B **(50 Marks)**

2.a) Define f_β and f_T, and derive the relation between them. [5M]
   b) Derive the expression for gain-bandwidth product for voltage. [5M]

OR

3. Derive the expression for short circuit current gain in common emitter amplifier. [10M]

4. If the gain of an amplifier reduces to 1% of its open loop gain of 120 with negative feedback, compute the feedback factor and loop gain. [10M]

OR

5. Briefly explain the current shunt feedback, also find the gain, input impedance and output impedance. [10M]

6. Briefly explain about RC Phase shift oscillator with neat diagram. [10M]

OR

7. Explain the Wien bridge oscillator circuit with neat diagram. [10M]

8. Compare push pull and complementary symmetry configuration for class-B power amplifiers. [10M]

OR

9. In a tuned amplifier circuit C=500pF, L=20μH, R_L = 1.5kΩ and the transistor has h_{fe} =50 and input resistance of 200 Ω. The coil used has Q factor=30. Calculate i) resonant frequency of the tuned circuit, ii) impedance of the tuned circuit, iii)voltage gain of the stage. [10M]

10. Draw the circuit diagram of Astable multivibrator and explain its working. [10M]

OR

11. Draw the circuit diagram of Mono multivibrator and explain its working. [10M]

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