Hall Ticket Number:

Code No. : 22312

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (E.C.E.) II Year II-Semester Main & Backlog Examinations, May-2017
### Analog Electronic Circuits

Time: **3** hours

Max. Marks: **70**

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. An amplifier consists of 3 identical stages in cascade. The bandwidth of overall Amplifier extends from 20 Hz to 20 kHz. Calculate the bandwidth of individual stage.

2. Draw the cascode amplifier and give its advantage.

3. Identify the feedback topology in the amplifier circuit and give the type of sampling and mixing.
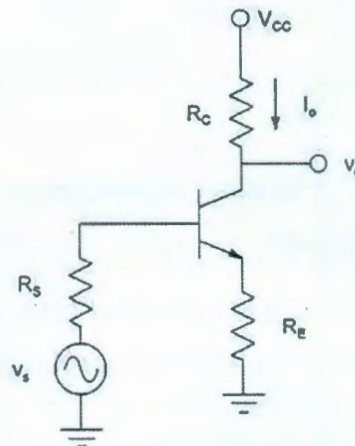
4. What do you mean by voltage amplifier and Current amplifier?

5. Draw the equivalent circuit of crystal.

6. Justify the need for regulator circuit in DC Power supply.

7. Explain why even harmonics are cancelled out in Push Pull Amplifiers.

8. Define cross over distortion and explain how it is eliminated.

9. Calculate the output of differential amplifier if the CMRR is 10,000, A_d = 1000, input signals applied are $1050\mu V$ and $950 \mu V$.

10. Draw the circuit diagrams of dual input balanced output and single input unbalanced output differential amplifiers.

Part-B (5 × 10 = 50 Marks)

11. a) Draw the circuit of an emitter follower, and derive the expressions for A_I, A_v, R_i, R_0 in terms of CE parameters.   [6]

    b) What is Miller effect capacitance? Explain with example.   [4]

12. a) Draw the circuit diagram of a current series feedback amplifier, derive expressions to show the effect of negative feedback on input & output impedances, bandwidth, distortion of the amplifier.   [6]

    b) If the non-linear distortion in a negative feedback amplifier with an open loop gain of 100 is reduced from 40% to 10% with feedback, compute the feedback factor, β of the amplifier.   [4]

13. a) With the help of suitable schematic and description, show that both positive and negative [6] feedback are used in a Wien Bridge oscillator. Establish the condition for oscillations.

b) Find C and h_{fe} of a transistor to provide f_0 of 50 KHz of a RC transistorized phase shift [4] oscillator. Given, $R_1 = 22$ KΩ, $R_2 = 6.8$ K Ω, $R = 2.2$ KΩ, $R_C = 20$ KΩ, $R_E = 6.8$ KΩ.

14. a) List the advantages of complementary-symmetry configuration over push pull [4] configuration.

b) A single stage transformer coupled Class-A amplifier having a turns ratio 5:1, Vcc = 20V, [6] $V_{CEQ} = 10V$, $I_{CQ} = 600$ mA, $R_L = 16$ Ω. The ac output current varies by 300mA, with the ac input signal. Calculate

    i)   The power supplied by the dc source to the amplifier circuit.
    ii)   DC power consumed by the primary of the transformer.
    iii) AC power delivered to the load.
    iv) DC power wasted in transistor collector.
    v)   Overall efficiency.
    vi) Collector efficiency.

15. a) Define the terms: [6]
    i)   Input off-set voltage   ii) Input off-set current   iii) Slew rate   iv) CMRR.

b) Write a note on Level translator. [4]

16. a) List the differences between different types of feedback topologies. [4]

b) A transistor has $f_T = 50$ MHz, and the h-parameters are given at $I_C = 10$ mA, $V_{CE} = 10V$, [6] and at room temperature. $h_{ie} = 500$ Ω $h_{oe} = 4 \times 10^{-5}$ A/V, $h_{fe} = 100$, $h_{re} = 10^{-4}$. Compute the values of all the hybrid-π parameters.

17. Write short notes on any *two* of the following:
    a) Compare the different oscillators. [5]
    b) Tuned amplifier and its applications. [5]
    c) Constant current bias circuit for differential amplifier. [5]

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