U.S.N ☐☐☐☐☐☐☐☐☐☐

P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Third Semester, B.E. - Electrical and Electronics Engineering
**Semester End Examination; Dec - 2017/Jan - 2018**
Analog Electronics Circuits

Time: 3 hrs   *Max. Marks: 100*

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.
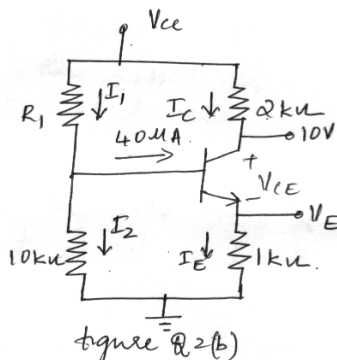
UNIT - I

1 a.	What is biasing of transistor? Explain the factors that affect selection of Q-point anywhere in the active region for the transistor to operate as an amplifier.	8
b.	For the clipping circuit shown in Fig. Q 1(b). Determine the transfer characteristics and sketch the output wave form.	6

figure Q1 (b).
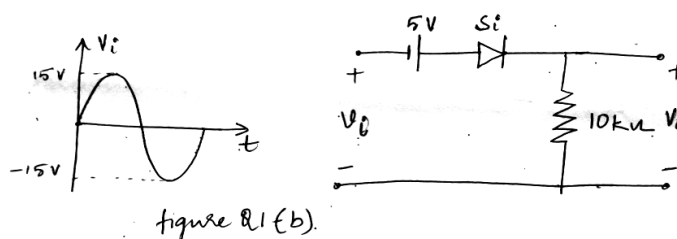
c.	Explain the effect of various capacitors on frequency response of the amplifier.	6
2 a.	Explain the operation of negative clamper.	6
b.	For the voltage divider bias shown in the Fig. Q 2(b). Determine;	8

    (i) I_C and V_E (ii) V_{CC} and V_{CE} (iii) V_B and R_1.

Assume silicon transmitter with $\beta = 80$.

figure Q 2(b)

c.	Explain the operation of voltage doubler circuit.	6

UNIT - II

3 a.	Derive the expression for A_V, A_I, R_i and R_0 for CE amplifier using h-parameter model.	10
b.	With the neat circuit diagram explain the operation of RC phase shift oscillator. Write the expression for the frequency of oscillation.	10
4 a.	Derive the expression for frequency of wein bridge oscillator and explain its operation with a neat circuit diagram.	10

b. Starting from fundamentals, define h-parameter and obtain h-parameter equivalent circuit of common emitter configuration. 10

UNIT - III

5 a. With a block diagram, explain the concept of feedback. List the advantages of Negative feedback. 10

b. Draw the block diagram of voltage series feedback amplifier and find the effect of feedback on input and output impedances. 10

6 a. Derive the expression for input resistance of current series and current shunt feedback amplifier. 10

b. Determine the voltage gain, input and output impedance with feedback for voltage series having $A = -100$, $R_i = 10$ kΩ and $R_0 = 20$ kΩ for feedback with $\beta = -0.1$. 5

c. Show how bandwidth of an amplifier increases with negative feedback? 5

UNIT - IV

7 a. Draw the circuit of class A transformer coupled power amplifier. Explain the operation of the circuit with the help of neat waveform. Also derive an expression for maximum efficiency of conversion. 12

b. A class B power amplifier is delivering an input voltage of 10 V peak to a 8 Ω load, if DC power supply is 30 V. Calculate;

(i) DC power input   (ii) AC power delivered to load

(iii) Conversion efficiency   (iv) Power developed in the collector of each transistor. 8

8 a. With a neat diagram and waveform, explain the operation of class-B push-pull power amplifier. Also show how even harmonic can be eliminated with push-pull operation? 10

b. Explain the operation of series fed direct coupled class-A power amplifier. Also show that the maximum efficiency of series fed direct coupled class-A power amplifier is 25%. 10

UNIT - V

9 a. Sketch the circuit of 4-input R-2R DAC and explain its operation. 10

b. Draw the diagram of an Op-Amp inverting schmitt trigger circuit. Explain the circuit operation. Define UTP and LTP. Sketch the typical input and output waveform. 10

10 a. Briefly explain :

(i) Successive approximation A/D converter

(ii) Sample and hold circuit. 8

b. With the help of neat circuit diagram. Explain how output offset voltage can be nullified using Op-Amp? 6

c. Briefly explain how Op-Amp can be used as comparator. 6

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