Solid State Devices & Circuits - II
(144112 / 184111/ 234112)

P. Pages : 3

Time : Three Hours   **Max. Marks : 80**

Instructions to Candidates :
1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Attempt **any two** sub questions from each unit.
5. Assume suitable data wherever necessary.
6. All questions carry equal marks.
7. Figures to right indicate full marks

UNIT - I

1   Attempt **any two.**   **16**

a)   Draw circuit diagram of. Astable multivibrator and explain its operation with the help of waveforms.

b)   What is significance of CMRR ? Explain any one method to improve CMRR. of differential Amplifier.

c)   For the differential Amplifier shown in fig - 1. Determine
   i)   Operating point.   ii) Voltage gain Avd & Avc.
   iii)   CMRR
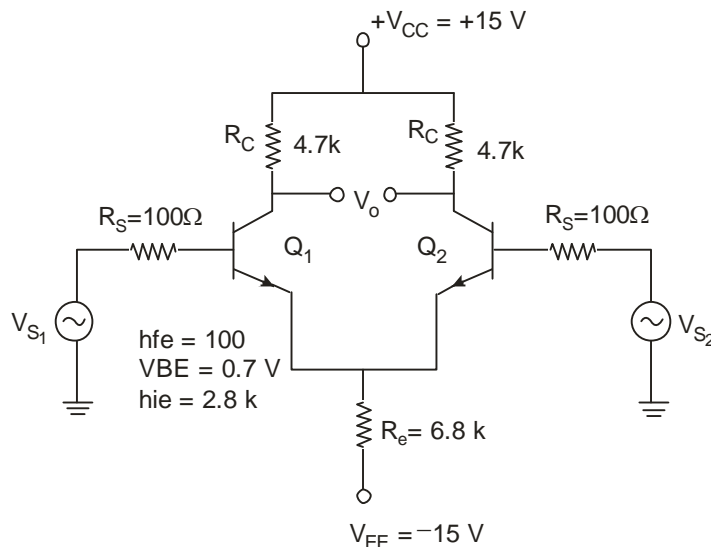

Fig - 1

UNIT - II

2. Attempt **any two**   **16**

a) Define F_β, F_α & F_T for the transistor amplifier. Also derive the expression of F_β For CE Amplifier.

b) Draw circuit diagram of single tuned RF amplifier and Explain its operation in detail.

c) Write short note on stagger Tuned Amplifier.

UNIT - III

3. Attempt **any two.**   **16**

a) Derive the Expression of Maximum conversion efficiency of transformer coupled class 'A' power Amplifier.

b) Calculate efficiency of complementary class 'B' power amplifier using ideal emitter follower circuit and two dc power supply of +20V & -20V. It is driving load of 8Ω for sine wave input of
   i)   Vin = 10V rms
   ii)   Vin = 5V rms.

c) What is cross over distortion and explain how it is eliminated.

UNIT - IV

4. Attempt **any two.**   **16**

a) Explain how the performance of an amplifier improve with negative feedback. Derive equation of input impedance and output impedance of voltage shunt feedback.

b) For the circuit shown in fig. 2 identify the type of feedback and calculate AV_F, R_{if} and R_{OF} where hie $=2k\Omega$, hfe $= 50$
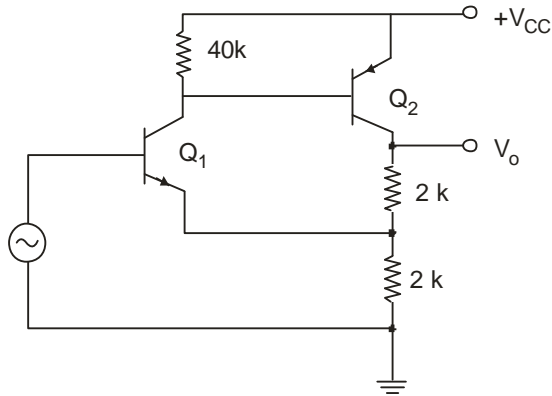
Fig 2

c) An amplifier has a midband gain of 125 and bandwidth of 250 kHz.
   i)   If 4% negative feedback is introduced, Find the new bandwidth and gain.
   ii) If the bandwidth is to be restricted to 1mHz. Find the feedback ratio.

UNIT - V

5. Attempt **any two**   **16**

a) Define line and load regulation. Draw circuit diagram of transistorised series feedback regulator and derive its output equation.

b) Explain feedback protection circuit in detail.

c) Draw a phase shift oscillator circuit and derive for its frequency.

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