

4E 2086

Roll No. _____

[Total No. of Pages : 2]

4E 2086**B.Tech. IV Semester (Main/Back) Examination 2012****Electronics Instrumentation & Control****4IC2 Analog Electronics (Old Back)****Common for 4IC2, 4EC2****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 24****Instructions to Candidates:**

Attempt any Five questions selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly.) Units of quantities used/ calculated must be stated clearly.

Unit - I

1. a) Give complete classification of feedback amplifiers with the help of neat diagram. (8)
- b) If an amplifier with gain of -1000 and feedback of $\beta = -0.1$ has a gain change of 20% due to temperature, calculate the change in gain of feedback amplifier. (8)

OR

1. a) What is the effect of negative feedback on gain and bandwidth of an amplifier? (8)
- b) Explain and analyse with the help of circuit diagram, a current-series feedback amplifier. (8)

Unit - II

2. a) Draw circuit diagram of R-C phase shift oscillator and explain its working. (8)
- b) What is Barkhausen criterion for sustained oscillation. With the help of waveform, explain how oscillations are buildup if criterion is not met. (8)

OR

2. a) Write a short note on crystal oscillator. (8)
- b) Explain working of Transistor Colpitt oscillator with neat circuit diagram. (8)

Unit - III

3. a) Draw hybrid π model for a transistor in CE configuration. Define various parameters. (8)
- b) Following transistor measurements made at $I_C = 5\text{mA}$, $V_{CE} = 10\text{V}$ and at room temperature. $h_{fe} = 100$, $h_{ie} = 600\Omega$ $|A_i| = 10$ at 10 MHz and $C_C = 3\text{pF}$. Find f_B , f_T , C_e , $r_{b'e}$, $r_{bb'}$. (8)

OR

3. a) Draw and explain the small signal equivalent circuit for emitter follower stage at high frequencies. (8)
- b) Explain alpha cutoff frequency. Derive expression for diffusion capacitance C_{D_e} . (8)

Unit - IV

4. a) Draw circuit of single tuned amplifier and explain its working with frequency response curve. (8)
- b) Draw parallel resonant circuit and obtain the expression for its bandwidth. (8)

OR

4. a) Explain stagger tuned amplifier with its frequency response curve. (7)
- b) The single tuned amplifier with capacitive coupling consists of tuned circuit having $R = 10\Omega$, $L = 20\text{mH}$, $C = 0.05\mu\text{F}$. Determine
- Resonant frequency
 - Q-factor
 - Band width of amplifier. (9)

Unit - V

5. a) Distinguish amongst class A, class B and class 'C' amplifiers (8)
- b) Draw the circuit and explain the operating of a class A push pull amplifiers. (8)

OR

5. a) Determine the overall efficiency of class B power amplifier when $V_{CC} = 20\text{V}$ and $V_{CE_{\min}} = 2.5\text{V}$. (8)
- b) What is difference between voltage amplifier and power amplifier. Classify power amplifier according to mode of operation. (8)