

26th May 2007

- N.B. : (1) Question No. 1 is **compulsory**.
 (2) Solve any **four** questions from remaining.
 (3) Assume **suitable** additional data whenever **necessary**.

1. Design a two stage R-C coupled CE amplifier using transistor type BC 147 A to meet following specifications. **20**

$A_v \geq 8000$; $S_{i(c)} \leq 10$; $F_L \leq 30$ Hz; $V_o = 2.5$ V

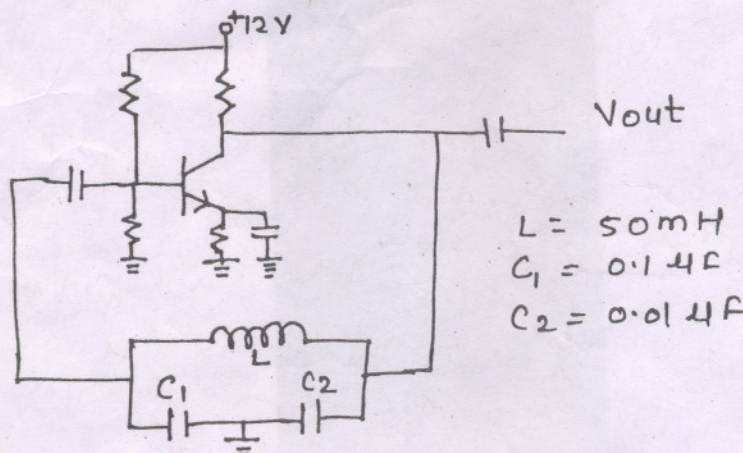
Assume suitable V_{cc} . Calculate A_v , R_i of the designed amplifier.

2. (a) A transformer coupled class A amplifier drives 8Ω through 4:1 transformer. $V_{cc} = 35$ V and output power is 2 Watt. **10**

- Determine : 1. $P(a.c.)$ 2. $V_L(a.c.)$ 3. V a.c. transformer primary
 4. RMS value of load and primary current.

- (b) Explain with diagram working of transformer coupled class B push pull amplifier. **10**

3. (a) Determine the frequency of oscillator in the following figure. Assume negligible loading on the feedback circuit. Q is greater than 10. Find the frequency if the oscillator loaded to point where Q drops to 4. **10**



- (b) Draw the diagram of wein bridge oscillator. Derive the expression for resonant frequency. **10**

4. (a) Draw the equivalent circuit of FET amplifier at high frequency. Derive the expression for upper cutoff frequency. **10**

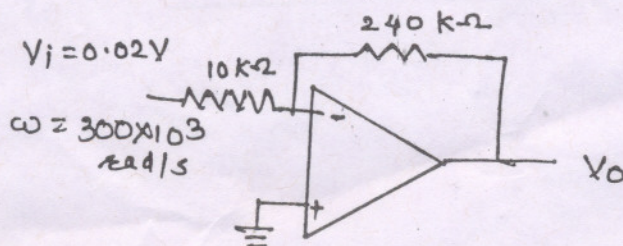
- (b) Explain different methods of improve CMRR of differential amplifier. **10**

5. (a) Draw the circuit diagram and derive expression for the gain of three Op-Amp. instrumentation amplifier. **10**

- (b) Explain with block diagram different topologies of negative feedback amplifier. What is the improvement in the A_v and A_i ? **10**

6. (a) Draw BiFET, BiMOS differential amplifier circuits. State application for each. **10**

- (b) Derive relation for maximum frequency at which Op-Amp may operate. For the following circuit, calculate maximum frequency that can be used. Slew rate = 0.6 V/ μ S **10**



7. Write short note on :

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- (a) Ideal characteristics of any voltage amplifier
- (b) Regenerative comparator using Op-Amp.
- (c) Crystal oscillator
- (d) Heat sink
- (e) Op-Amp as integrator.