4E 4120

Roll No. _____ [Total No. of Pages : 3]

4E 4120

B.Tech. IV Semester (Main/Back) Examination, June/July - 2015

Electrical Engineering

4EE1A Analog Electronics

(Common to EE,EX, EC and EI)

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 26

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 suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. For BJT feedback amplifier shown in fig-(1) h_{fe}=100, h_{ie}=1k, neglect h_{re} & h_{oe}. Find with R_e=0Ω

   a) $R_{Mf} = \frac{v_0}{I_s}$

   b) $A_{vf} = \frac{v_0}{v_s}$

   c) R_{if}

   d) R'_{of}

   e) Repeat the four preceding calculation if R_e=1kΩ **(16)**

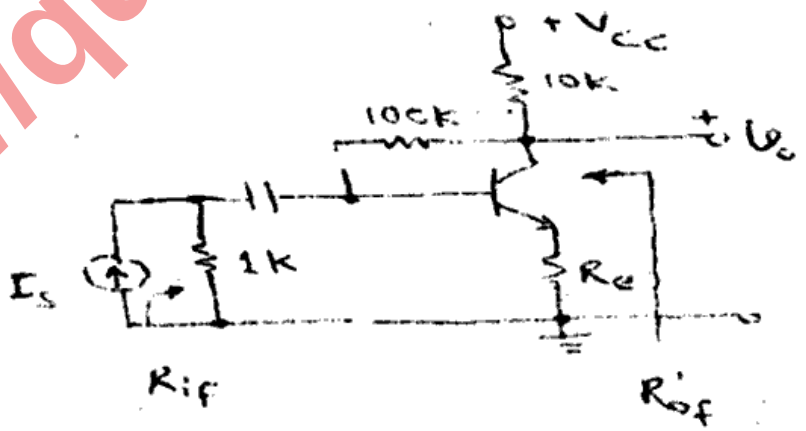
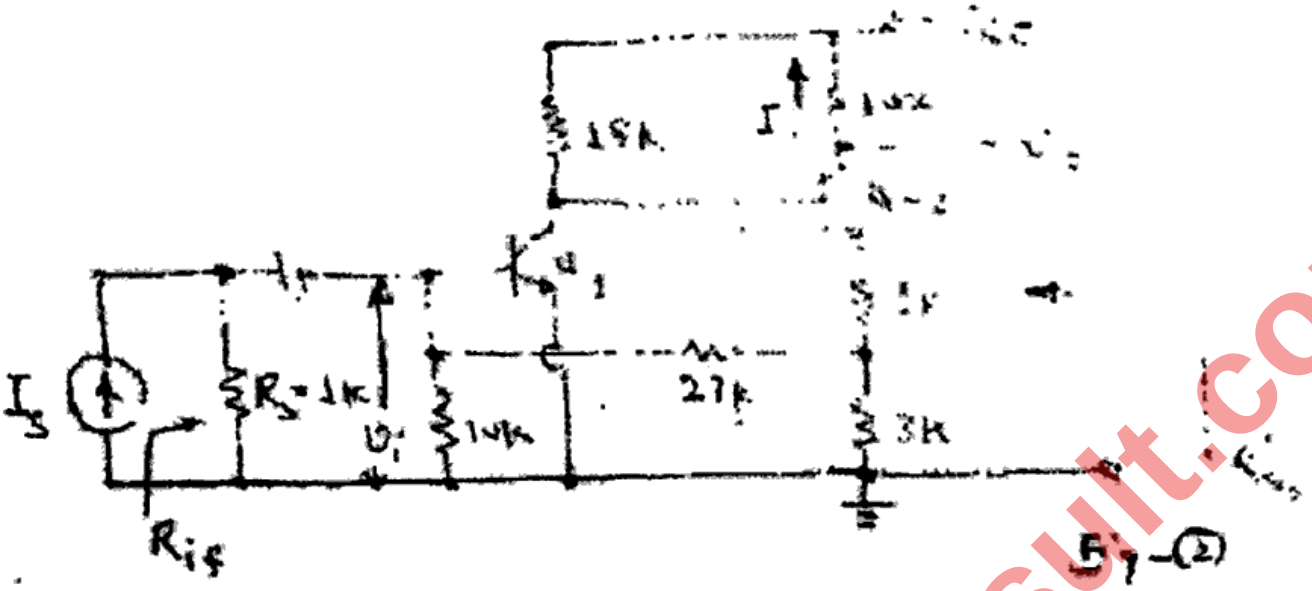


Fig. (1)

OR

1.



For the circuit shown in fig-(2) with h_{fe}=50, h_{ie}=2k h_{re} = h_{oe} = 0. Find

a) $A_{if} = \frac{I_0}{I_S}$

b) R_{if}

c) $A_{vf} = \frac{v_0}{v_s}$ Where $I_B = \frac{V_s}{}$

d) $A'_{vf} = \frac{v_0}{v_i}$

e) R'_{of} **(16)**

2. a) Distinguish between Hartley and Colpitts oscillators and derive the expressions for oscillating frequencies. **(8)**

b) Find the minimum voltage gain and the frequency of oscillation for a colpitts oscillators with $c_1 = 0.004\,\mu f$, $c_2 = 0.03\mu f$ *and* $L = 4.0mH$. **(8)**

OR

2. Explain following with required circuits and waveforms.

a) Schmitt trigger **(8)**

b) Blocking Oscillator. **(8)**

Unit - III

3. Draw hybrid - π model and explain each parameter. Also find the inter-relation between h-parameters and hybrid- π parameters. **(16)**

OR

3. a) With g_m=50mA/v, $r_{b'e}$ =1k, C_e=1pf & C_c=0.2pf, determine the values of f_β & f_T **(8)**

b) Prove $f_H = \frac{g_m + g_{b'e}}{2\pi(C_l + C_c)}$ where C_l = Load capacitance **(8)**

Unit - IV

4. a) At resonance in the circuit fig-(3), I=10 mA and V=7.5v. The inductive reactance is 455Ω & C=350 pf. Find R,Circuit Q and resonant frequency. **(8)**

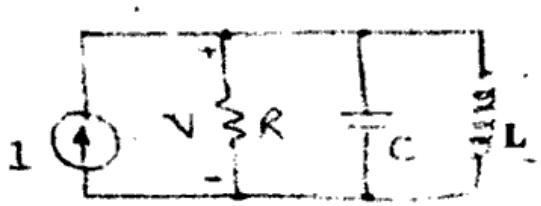


Fig-(3)

b) Parallel resonant circuit as in fig-(3) has Q=120 & I=0.6mA. The V is 12v. Find reactances of L & C at resonance f =3.5MHz **(8)**

OR

4. a) Explain stagger tuned amplifier with required figures. **(8)**

b) Explain class-C tuned amplifier with required figures. **(8)**

Unit - V

5. Compare class A, class B, class AB and class C power amplifiers with required circuit diagrams and waveforms **(16)**

OR

5. a) A class B push-pull amplifier uses Vcc=15v and R_L=8Ω. Find the maximum input power, ac output power, conversion efficiency and power dissipated by each transistor **(8)**

b) Different complementary symmetry and quasi complimentary symmetryamplifiers. **(8)**

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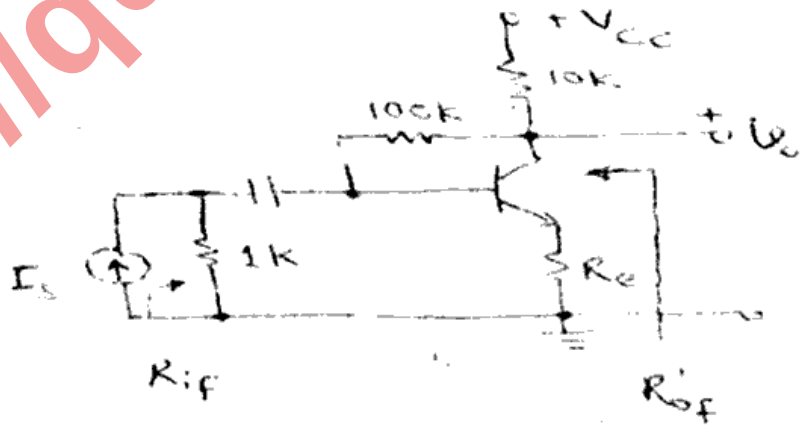

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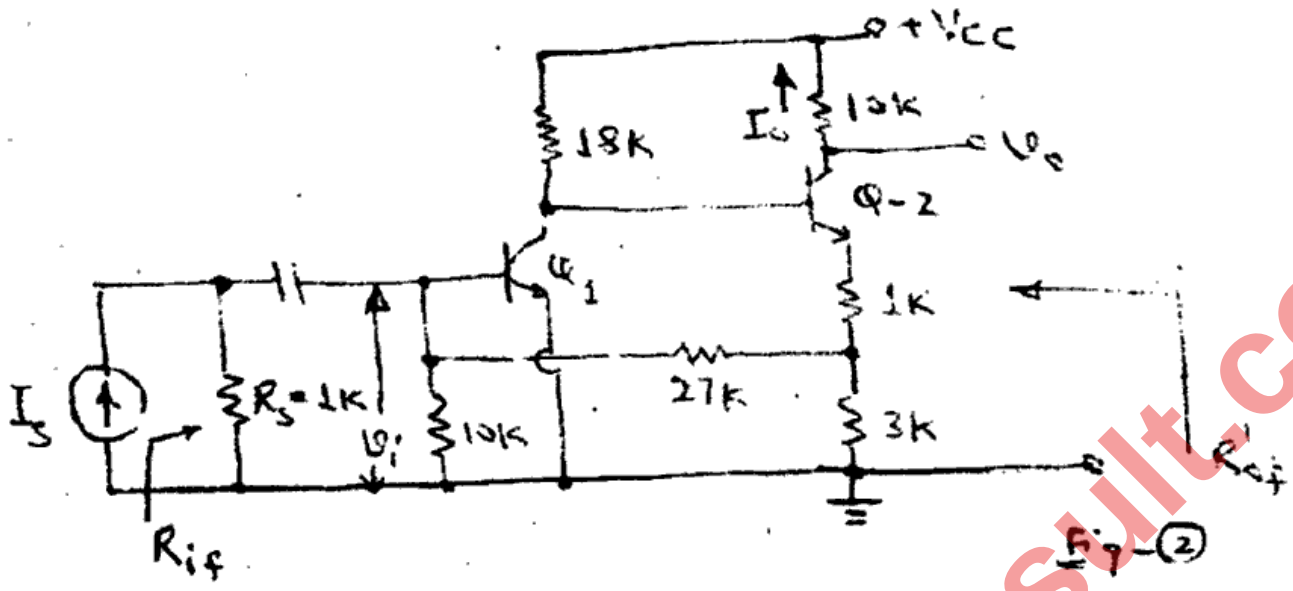

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