Code No: 07A3EC14   **R07**   **Set No. 2**

II B.Tech I Semester Examinations,May 2011
ELECTRONIC   CIRCUIT ANALYSIS
Common to Electronics And Telematics, Electronics And Communication
Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Explain how Switching Regulator overcomes the disadvantage of Series and Shunt type of regulators?

   (b) Explain why pulse width modulator is used in Switching regulators and also explain the operation of it. [8+8]

2. Draw the circuit diagram of a Class-C tuned amplifier. Explain its operation with neat waveforms. Derive the expression for percentage efficiency. [16]

3. (a) What is the role of f_T in defining the frequency range for the validity of Hybrid - π model of a transistor?

   (b) Show that $r_{b'e}$ in Hybrid - π model, is directly proportional to temperature and inversely proportional to collector current. [8+8]

4. (a) For a power supply of 4% voltage regulation and an open circuit output voltage of 48V dc. Calculate the full load voltage of the supply?

   (b) Explain how Shunt type of regulator gives more current limiting compared to Series type of regulator.

   (c) The base to emitter voltage of the transistor shown in figure 7c. is 0.7V. V_i can vary from 12V to 24V.

      i. What breakdown voltage should the zener diode have if the load voltage is to be maintained at 9V?

      ii. If the zener diode must conduct 10mA of reverse current to remain in breakdown, What maximum value should Rs have?

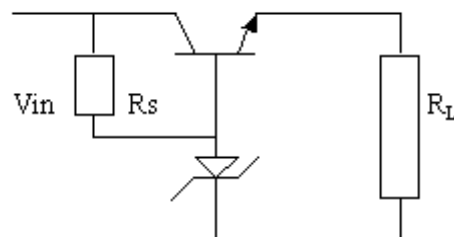   iii. With the value of Rs found in (ii), what is the maximum power dissipated in the zener diode? [4+6+6]

Figure 7c

5. (a) Obtain the theoretical expressions for f_{1n} and f_{2n} when n-stages of identical amplifiers are cascaded.

1

R07 **Set No. 2**

(b) A CE R-C coupled amplifier uses transistors having $h_{oe} = 24\mu A/V, and \ h_{ie} = 1K$. The potential divider biasing resistors are $R_1 = 50K \ \ and \ \ R_2 = 4K$. The load resistor is $R_C = 1K$. What should be the minimum value of coupling capacitor C_b in order to have lower 3-dB frequency for voltage gain not exceeding 12 Hz. [8+8]

6. (a) Draw the circuit diagram of Common Collector amplifier. Derive the expressions for $A_I, A_V, R_i,$ and R_o in terms of h-parameters of CE transistor.

(b) For a CE configuration, what is the maximum value of R_S for which R_o differs by no more than 10 percent of its value for $R_S = 0$. The h-parameter values are $h_{fe} = 50, h_{ie} = 1.1K\Omega, h_{re} = 2.5 \times 10^{-4}, h_{oe} = 25\mu A/V$. [10+6]

7. (a) State the functions and frequency ranges of operation of tuned amplifiers with relevant reasons?

(b) Draw the circuit of a typical single tuned RF amplifier stage employing a transistor. If the tuned circuit contains L=200 μH,C=126pF, $R_L = 15k\Omega$. Calculate the bandwidth of the amplifier? [6+10]

8. (a) Define the conversion efficiency of a power amplifier. A class ? A power amplifier with a direct coupled load has a collector efficiency of 15% and delivers a power output of 5 Watts. Find

    i. The DC power input

    ii. Power dissipation at maximum output [6]

(b) Draw the push-pull power amplifier circuit. Derive the expression for the output current in push -pull amplifier with base current as $i_b = I_{bn} \sin wt$. [10]

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Code No: 07A3EC14 **R07** **Set No. 4**

II B.Tech I Semester Examinations,May 2011
ELECTRONIC CIRCUIT ANALYSIS
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Engineering

Time: 3 hours Max Marks: 80

Answer any FIVE Questions
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1. Draw the circuit diagram of a Class-C tuned amplifier. Explain its operation with neat waveforms. Derive the expression for percentage efficiency. [16]

2. (a) Define the conversion efficiency of a power amplifier. A class ? A power amplifier with a direct coupled load has a collector efficiency of 15% and delivers a power output of 5 Watts. Find

   i. The DC power input
   ii. Power dissipation at maximum output [6]

   (b) Draw the push-pull power amplifier circuit. Derive the expression for the output current in push -pull amplifier with base current as $i_b = I_{bn} \sin wt$.
   [10]

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   (b) A CE R-C coupled amplifier uses transistors having $h_{oe} = 24\mu A/V$, and $h_{ie} = 1K$. The potential divider biasing resistors are $R_1 = 50K$ and $R_2 = 4K$. The load resistor is $R_C = 1K$. What should be the minimum value of coupling capacitor C_b in order to have lower 3-dB frequency for voltage gain not exceeding 12 Hz. [8+8]

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3

7. (a) What is the role of f_T in defining the frequency range for the validity of Hybrid - π model of a transistor?

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8. (a) For a power supply of 4% voltage regulation and an open circuit output voltage of 48V dc. Calculate the full load voltage of the supply?

   (b) Explain how Shunt type of regulator gives more current limiting compared to Series type of regulator.

   (c) The base to emitter voltage of the transistor shown in figure 7c. is 0.7V. V_i can vary from 12V to 24V.

      i. What breakdown voltage should the zener diode have if the load voltage is to be maintained at 9V?

      ii. If the zener diode must conduct 10mA of reverse current to remain in breakdown, What maximum value should Rs have?

      iii. With the value of Rs found in (ii), what is the maximum power dissipated in the zener diode?   [4+6+6]
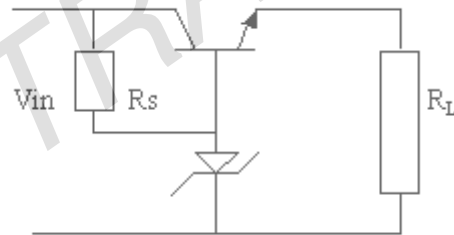

Figure 7c

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4

$\boxed{\textbf{R07}}$ $\boxed{\textbf{Set No. 1}}$

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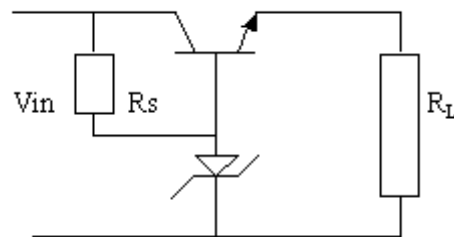

Figure 7c

3. (a) Define the conversion efficiency of a power amplifier. A class ? A power amplifier with a direct coupled load has a collector efficiency of 15% and delivers a power output of 5 Watts. Find

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Code No: 07A3EC14 | **R07** | **Set No. 3**

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Common to Electronics And Telematics, Electronics And Communication Engineering

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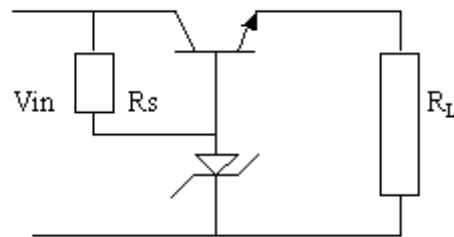

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