Code: 9A02405

R09

B.Tech II Year II Semester (R09) Supplementary Examinations May/June 2016
ANALOG ELECTRONIC CIRCUITS
(Electrical & Electronics Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1   (a) Derive the voltage gain, current gain, input resistance and output resistance of a single stage CB amplifier with source resistance RS and load resistance RL.
    (b) In a single stage CB amplifier circuit, R_E = 10K, R_C = 10K, V_{EE} = −15 V, V_{CC} = 20 V, R_L = 10K and R_S = 0.5K. Find A_I , Ri, Ro & A_V.

2   (a) What is diffusion capacitance of a transistor and derive its equation.
    (b) In a given germanium PNP transistor whose base width is 10^{-4} cm. At room temperature and for a dc emitter current of 2mA, find emitter diffusion capacitance and gain-bandwidth product.

3   (a) Explain the stabilization gain in feedback amplifier.
    (b) An amplifier has a voltage gain of 400, f_1 = 50 Hz, f_2 = 200 kHz and a distortion of 10% without feedback. Determine the amplifier voltage gain f_{1f}, f_{2f} and D_f when a negative feedback is applied with feedback ratio of 0.01.

4   (a) Draw and explain the basic FET resonant circuit oscillator.
    (b) Determine frequency of oscillations when a RC phase shift oscillator has R = 10k, C = 0.02μF and Rc = 4.7k.

5   (a) Write a short note on power output and efficiency of power amplifiers
    (b) In case of class A power amplifiers circuit, R_L = 5Ω. Transistor ratings are $P_{C(max)}$ = 10 W, $V_{CE (sat)}$ = 1 V, $V_{CE (max)}$ = 12 V. Transformer coupling is used with n = 2. Determine the efficiency of the amplifier.

6   (a) For a shunt diode clipper circuit V_i = 20 sin wt, V_R = 10 V is obtained from a potential divider circuit using 100 V supply and 10K potentiometer.
         (i) Draw the circuit diagram.
         (ii) If R_f = 50 -, R_r = 1 and V_r = 0, sketch the transfer characteristic, output waveform for the given V_i.
    (b) Draw the basic circuit diagram of a DC restorer circuit and explain its operation. Sketch the output waveform for a sinusoidal input signal.

7   (a) Explain in detail the junction diode switching times.
    (b) Give a brief note on piece-wise linear diode characteristics.

8   (a) Draw the circuit diagram of self-bias with symmetrical triggering using diodes. Explain the working of the same.
    (b) Compare between triggering at base and collectors.

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