C 15285   (Pages 2)

FOURTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2010

EC/PT 2K 404/PTEC 2K 504—ELECTRONIC CIRCUITS

Time : Three Hours   Maximum : 100 Marks

Part A

1. (a) Find the values of emitter current, collector current and collector to emitter voltage for the emitter bias circuit shown below. Assume $V_{BE} = 0.7$ V.
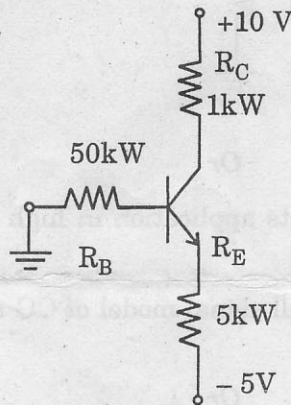

Fig.1.

(b) Draw the frequency response characteristics of transformer coupled amplifier and explain.

(c) For an P-channel JFET apply self bias and draw and circuit. What are the advantages of self bias compared to Gate bias.

(d) Derive expression for A_v and R_o of a common source JFET amplifier.

(e) Compare positive feedback and negative feedback.

(f) In a transistor Colpitts oscillator $C_1 = 0.001$ µF, $C_2 = 0.1$ µF and $L = 5$ µ + 1. Find the required gain for oscillation and frequency of oscillation.

(g) State difference between voltage amplifier and power amplifier.

(h) Draw the circuit of class D amplifier and discuss its operation.

                                                    (8 × 5 = 40 marks)

Turn over

Part B

2. (a) (i) Explain the factors that affect the stability of Q-point in an amplifier.   (5 marks)

   (ii) If $\alpha = 0.98$ and $V_{BE} = 0.7$ V, find R_1 in the circuit shown for $I_E = 2nA$. Neglect reverse saturation current.
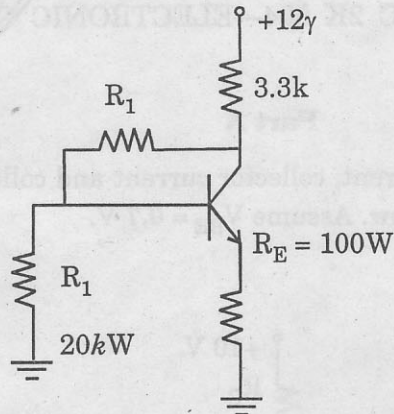

Fig.2.

(10 marks)

Or

   (b) State Miller's theorem and show its application in high frequency response of RC coupled amplifier. Derive $A_{v\,(HF)}$.

3. (a) Draw the circuit diagram and small signal model of CG amplifier. Derive expression for its voltage gain and input resistance.

Or

   (b) Discuss the various biasing schemes available to achieve bias in MOSFET.

4. (a) Give an example for current series feedback amplifier and determine the effect of negative feedback on the various parameters of this circuit.

Or

   (b) Draw the circuit of RC phase-shift oscillator and obtain :

      (i) condition for oscillations ;

      (ii) fosc.

5. (a) Derive the expression for collector efficiency in class B push-pull amplifier. What is the power dissipation in the transistor ? List its disadvantages. How can it be overcome ?

Or

   (b) Elaborate on Broad band amplifiers their need and types.

                                                        [4 × 15 = 60 marks]