H 1346

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2006.

Second Semester

Information Technology

IF 141 — ELECTRONIC DEVICES AND CIRCUITS

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by avalanche breakdown in diode?

2. In a BJT, then value of β, I_B and I_{CBO} are 200, $50\,\mu A$ and $5\,\mu A$ respectively. Find the value of I_C and I_{CEO}.

3. What are the factors which causes shifting of Q-point in an amplifier?

4. What is meant by bandwidth of an amplifier?

5. What are the advantages of negative feedback in an amplifier?

6. In a Colpitts oscillator, the value of C_1 and C_2 are 10 μf and 1 μf respectively. Calculate the value of L to get frequency of oscillation of 5 kHz.

7. Draw the circuit diagram of astable multivibrator constructed using transistors.

8. What is the function of control voltage pin present in 555 timer?

9. Draw the circuit of subtractor constructed using op-amp and write the expression for output voltage in it.

10. What is meant by active filter?

PART B — (5 × 16 = 80 marks)

11. (i) Explain the working principle and drain - source characteristics n-channel JFET.

    (ii) Define the terms holding current and peak inverse voltage in SCR.

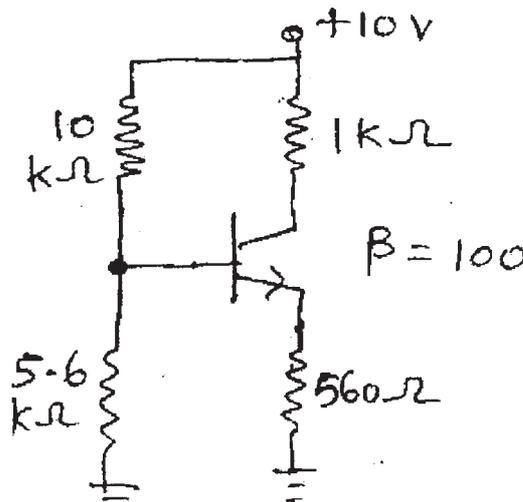12. (a) (i) Determine the value of I_{BQ}, I_{CQ} and V_{CEQ} in the circuit shown figure. 12.(a) (i).

Figure 12 (a) (i)

    (ii) Explain the working principle of single tuned amplifier briefly. (7)

Or

    (b) (i) Derive the expression for voltage gain and input impedance of a common collector amplifier with fixed bias. (8)

    (ii) Explain the working principle of a class A power amplifier briefly. (8)

13. (a) (i) How the negative feedback amplifiers are classified? (7)

    (ii) Explain the effect of negative feedback on gain, bandwidth and noise in an amplifier. (9)

Or

    (b) (i) Explain the basic principle used in oscillator. (6)

    (ii) With neat circuit diagram, explain the working principle of Hartley oscillator. (10)

(a) Explain the principle of operation of monostable multivibrator with necessary circuit and wave forms. (16)

Or

(b) Draw the internal block diagram of IC 555 and explain the function of different components present in it. (16)

15. (a) Explain the application of op-amp as :

(i) Integrator

(ii) Voltage to current converter in detail (8 + 8)

Or

(b) (i) Explain the following terms in op-amp :

(1) Input offset voltage

(2) CMRR

(3) Input offset current. (2 + 2 + 2)

(ii) Draw the circuit of first order Chebyshev low pass active filter and explain its frequency response characteristics. (10)

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