Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

B 2231

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2008.

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 a diode?

2. What are the different methods used to turn on a SCR?

3. Write the difference between Class A and Class B power amplifier.

4. Which BJT configuration has nearly unity voltage gain and which configuration has unity current gain.

5. Name the different feedback connections used in negative feedback amplifiers.

6. In a colpitts oscillator, the value of C_1 and C_2 are 0.1 μf and 0.01 μf respectively and the value of L in the tank circuit is 40 mH. Find the frequency of oscillation in it.

7. Draw the circuit of monostable multivibrator constructed using transistors.

8. In 555 timer, what is the function of control voltage pin?

9. Draw the op-amp circuit in which $V_0 = -V_1 + 2V_2$ where V_1 and V_2 are input voltages and V_0 is the output voltage.

10. What are the advantages of active filter over passive filter?

11. (a) Explain the input and output characteristics of BJT in common emitter configuration and explain how the various transistor's parameters can be found from the above characteristics. (16)

Or

(b) Describe the V-I characteristics of SCR in forward bias and reverse bias in detail. (16)
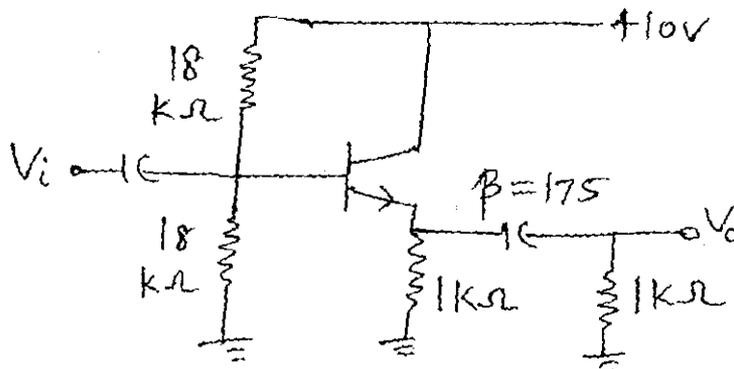
12. (a) (i) Find the value of I_{BQ}, I_{CQ} and V_{CEQ} in the circuit shown in figure. (8)
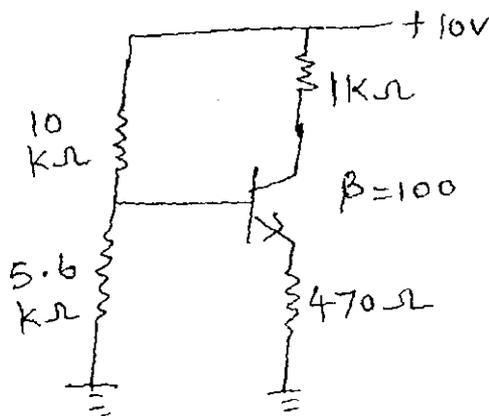
(ii) Obtain the maximum conversion efficiency of a Class B power amplifier. (8)

Or

(b) Find the input impedance, voltage gain, output impedance and current gain in the following circuit. (16)

13. (a) Derive the expression for input impedance and output impedance with feedback in the voltage – series and current – shunt negative feedback amplifiers. (16)

Or

(b) Explain the working principle of Hartley oscillator with neat diagram. Also write the expression for frequency of oscillation in it. (16)

14. (a) Describe the principle of operation of bistable multivibrator constructed using transistors with circuit diagram and necessary waveforms. (16)

Or

(b) Explain the construction of monostable multivibrator using IC 555 and its working principle. Also derive the expression for ON state period (T_{ON}) of the output voltage in it. (16)

15. (a) Describe the principle of operation of the following circuits constructed using op-amp:

(i) Voltage to current converter with grounded load. (8)

(ii) Multiplier. (8)

Or

(b) Explain the construction of second order Butterworth active filter using op-amp and its frequency response characteristics by deriving the expression for cut-off frequency. (16)

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