

College of Engineering, Pune
END SEMESTER EXAM
Year (F. Y. B.Tech)
(ET-101)- (Basic Electronics)

Day & Date- 19/11/2010

Max. Marks-50

Timing- 10 am - 1 pm

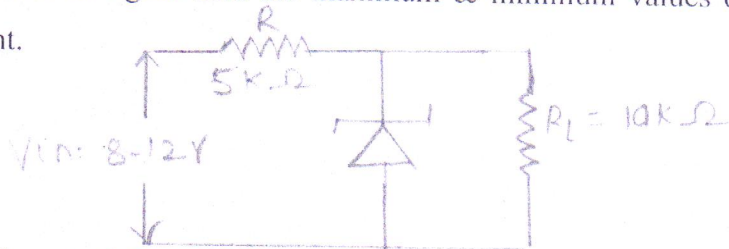
Duration -3 Hrs.

Instructions:

1. Figures to the right indicate full marks.
2. All questions are compulsory.
3. Assume Suitable data wherever necessary.
4. Draw neat figure wherever required.
5. Strictly follow the sequence of sub questions for each question.

Q1. A Define comparator. Explain non-inverting comparator using neat circuit diagram with reference as 2 V. Draw the input - output waveforms for input voltage 8 V peak to peak. (3)

B For the circuit shown in figure find the maximum & minimum values of zener diode current. (3)



C Draw the output characteristics of BJT in CE configuration. Indicate all the three regions of operation on it. Explain the operation of BJT as a switch. (3)

D State the applications of LED. (1)

Q2. A Draw & explain the internal functional diagram of IC 555. Explain each pin functions. (3)

B Draw & explain the circuit of Wein bridge oscillator. Hence find the values of R & R_F. (3)

Given $f_0 = 1.5 \text{ K Hz}$. $C = 0.05 \mu\text{f}$. $R_1 = 5 R$.

OR

Draw & explain the circuit of RC phase shift oscillator and hence find the values of R & R_F

Given $f_0 = 500 \text{ Hz}$. $C = 0.01 \mu\text{f}$. & $R_1 = 10 R$

- C Draw and explain the circuit diagram of Astable multivibrator & Hence find T_{ON} , T_{OFF} and Duty cycle. (4)

Given Data: $R_A=5.6 K\Omega$, $R_B=2.4K\Omega$ $C=0.1\mu f$

- Q3. A Define amplitude modulation and modulation index. Sketch the waveform for the same with proper notations. (3)

OR

Define frequency modulation and give mathematical representation of FM. Compare frequency and amplitude modulation.

- B What is GSM? Draw GSM system architecture. (3)

- E A carrier with an RMS voltage of 3 V and frequency of 20 MHz is modulated by a sine wave with a frequency of 500 Hz and amplitude of 1 V RMS. Write equation for the resulting signal. Also find the value of modulation index. (2)

- D What is near-far problem? How is it taken care in CDMA system? Specify any two features of CDMA. (2)

- Q4. A Reduce the following expressions and implement them using NAND gates only. (3)

$$Y = (\overline{AB} + \overline{A+B}) \overline{AB}$$

$$P = \overline{W}XY\overline{Z} + XY\overline{Z} + X\overline{Y}Z + X\overline{Y}Z$$

- B Design 2-bit asynchronous counter using T flip flop. (4)

- C Minimize the four variable logic function using K-map. Realize it using minimum number of gates. (3)

$$F(ABCD) = \sum m (0, 1, 3, 4, 5, 6, 9, 10, 11, 12, 14, 15)$$

- Q5. A Draw neat block diagram of CRO and explain function of each block. (4)

- B What is transducer? Explain active & passive transducers. (2)

- C A strain gauge with a gauge factor $K=2$ is bound to a steel member which is subjected to a strain of 10^{-6} . If the original no-strain resistance of the gauge is 120Ω . Calculate change in gauge resistance. (2)

- D. Draw and explain block diagram of public address system. (2)