Total number of printed pages–4

44 (Sem–2) BE (HG–2016) N

2022

BASIC ELECTRONICS

Paper : BCA–HG–2016

Full Marks : 80

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions : 1×8=8

(a) What is a Band pass filter ?

(b) Write down the mathematical expression for root mean square values of a voltage.

(c) Convert 25.8_{10} to Binary number.

(d) What do you mean by feedback ?

(e) Draw the logic symbol of XOR gate.

(f) What is a clamping circuit ?

(g) Define the term roll off rate.

(h) What is a register ?

Contd.

2. $2\times6=12$

(a) Define Lenz's law.

(b) Draw the I–V characteristics of an ideal diode.

(c) Why are NOR and NAND gate known as universal gate ?

(d) What is a dielectric constant ? Explain.

(e) What are transistor configurations ?

(f) Write down the truth table of a S–R flip-flop.

3. Answer ***any four*** questions of the following : $5\times4=20$

(a) Derive the mathematical expression of energy stored in a capacitor.

(b) Explain the process of calculating the value of resistor from its color code with neat diagram.

(c) How does bridge rectifier works ? Explain in detail with necessary diagram.

(d) Draw the circuit diagram of the clipping circuit and explain its working.

(e) Explain the Barkhausen criteria for oscillations.

(f) What are the differences between combinational and sequential logic circuit ?

(g) Draw the logic circuit of full adder. Write its truth table and explain in details about its working ?

(h) Elaborate the fundamental theorems of Boolean algebra.

(i) Write down the differences between avalanche and zener breakdown.

4. Answer ***any four*** questions of the following : 10×4=40

(a) Describe the construction and characteristic of Zener diode with the help of necessary diagram.

(b) Draw the logic circuit diagram of J–K flip-flop and write its truth table. Explain its working in detail.

(c) What is a multiplexer ? Explain the working of 1×8 multiplexer with the help of necessary diagram and truth table.

(d) How does a regulated power supply works? Describe using suitable diagram in detail.

(e) What is a passive filter? How is this different from active filter? Explain the working of passive band stop filter using appropriate diagrams.

(f) How is self-inductance different from mutual inductance? Describe using appropriate diagrams.

(g) What are the classification of feedback? Elaborate each of them. List the advantages and disadvantages of each of them.
