

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 : $1 \times 8 = 8$
- (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.

2×6=12

2.

- (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:
5×4=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.
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