WEST BENGAL STATE UNIVERSITY

B.Sc. General Part-II Examination, 2020

ELECTRONICS

PAPER: ELTG-II

Time Allotted: 2 Hours | Full Marks: 50

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

Section-A

1. Answer any ***five*** questions from the following: 2×5 = 10

   (a) Draw the circuit diagram of half adder using NAND gates.

   (b) Convert (45)10 to binary equivalent number.

   (c) What material do we use in the screen of CRO (Cathode Ray Oscilloscope)?

   (d) What is meant by voltmeter sensitivity?

   (e) What is the use of filters in the rectifier circuits?

   (f) Define ripple factor. What is its value for a full-wave rectifier?

   (g) Define percentage of regulation and efficiency of a rectifier.

   (h) Can you construct an EX-OR gate using all NAND gates?

   (i) What is Shunt regulator?

Section-B

Answer any *four* questions from the following 5×4 = 20

2. (a) What is MUX? Write down the truth-table of 4:1 MUX and draw its equivalent circuit using NAND gates only. (1+2)+2

   (b) Implement the following using 4:1 MUX

   $F(A, B, C) = \sum m(0, 2, 3, 5, 7)$

3. (a) Convert : (1+1+1)+2

   (i) $(1110111)_2$ into decimal

   (ii) $(5129)_{10}$ into BCD

   (iii) $(6F29AC)_{16}$ into binary

   (b) Subtract $(11)_{10} - (13)_{10}$ by using 2's complement method.

4. Implement the following function by using NAND gate: $A + AB + A\bar{B}C$. Convert $(2469)_{10}$ into BCD. 3+2

5. Design a D-flip flop using J-K flip flop. 5

6. (a) Simplify using Boolean algebra – $F(A,B,C) = ABC + A\bar{B}C + \bar{A}BC + AB\bar{C}$ 3+2

   (b) Differentiate combinational and sequential circuit.

7. (a) Convert a JK flip flop into T flip flop. 3+2

   (b) Distinguish between Synchronous counter and Asynchronous counter.

Section-C

Answer any *two* questions from the following 10×2 = 20

8. (a) Draw the block diagram of successive approximation type DVM and explain its measurement method. 7+3

   (b) Draw the circuit diagram of a Anderson bridge.

9. (a) What do you mean by Lissajous figures? 2+(3+2)+3

   (b) Describe the deflection systems of CRO. What is the function of time base generator?

   (c) Explain dual beam CRO.

10. (a) Draw the basic block diagram of an oscilloscope and explain the functions of each block. 6+(2+2)

    (b) How is the vertical axis of an oscilloscope deflected? How does it differ from horizontal axis?

11. (a) Explain the working principle of square wave generator using IC-741 OP-AMP chip. 6+(2+2)

    (b) Define the term duty cycle and time period of an oscillator.

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

——×——