WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 3rd Semester Examination, 2021-22

ELSACOR06T-ELECTRONICS (CC6)

Time Allotted: 2 Hours | Full Marks: 40

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.

GROUP-A

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

   (a) How can an EX-OR gate be used as a controlled inverter?

   (b) Realise a three input NAND gate using two input NAND gates only.

   (c) Define fan-out of a gate.

   (d) How can a decoder be used as a de-multiplexer?

   (e) Convert a J-K flip-flop to a D flip-flop.

   (f) Convert the binary number 101100110 to Gray-code.

   (g) Express two numbers 926 and 827 in BCD form and add them.

   (h) Do the following subtraction using 2's complement 72–48.

GROUP-B

Answer any *six* questions from the following 5×6 = 30

2. (a) If $Y = A'B + BC$, express Y in POS form. 3+2

   (b) Subtract 10110 – 11011 using 2's complement method.

3. (a) Show that a negative logic OR gate is equivalent to a positive logic AND gate. 2+3

   (b) Design a EX-OR gate using NAND gates only.

4. (a) Realise a 2-input 1+2+2

      (i) OR gate

      (ii) NAND gate using 2:1 MUX only

   (b) Realise the function $Y = \sum m(1, 2, 4, 7, 9, 13, 15)$ using a 8:1 MUX

5. (a) Explain 'Race' condition in a S-R flip-flop. 2+3
   (b) Design a J-K flip-flop using an S-R flip-flop.

6. Design a 3 to 8 line active low decoder using NAND gates only. 5

7. Explain the following: $2\frac{1}{2}+2\frac{1}{2}$
   (i) Entity Declaration
   (ii) Architecture Declaration.

8. (a) Explain the difference between an encoder and a priority encoder. 2+3
   (b) Design a 2-bit priority encoder.

9. Explain the Data Flow modeling scheme using suitable example. 5

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.*

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