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BIEL-030

DIPLOMA – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (DECVI) / ADVANCED LEVEL CERTIFICATE COURSE IN ELECTRONICS AND COMMUNICATION ENGINEERING (ACECVI)

Term-End Examination

00437

June, 2014

BIEL-030 : DIGITAL ELECTRONICS

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt **five** questions in all. Question no. **1** is compulsory.*

1. Choose the correct answer : *7×2=14*

(a) Two's complement of the binary number 01101100 is

(i) 10010100

(ii) 01101100

(iii) 10010011

(iv) 11101100

(b) The digital operations such as AND, OR, etc. can be performed by using

(i) switches

(ii) amplifiers

(iii) rectifiers

(iv) oscillators

(c) A combinational circuit

(i) always contains memory elements

(ii) never contains memory elements

(iii) may sometimes contain memory elements

(iv) both (i) and (iii)

(d) A multiplexer with 4-bit data select input is a

(i) 4 : 1 multiplexer

(ii) 8 : 1 multiplexer

(iii) 16 : 1 multiplexer

(iv) 32 : 1 multiplexer

(e) A FLIP-FLOP has two outputs which are

(i) always zero

(ii) always one

(iii) always complementary

(iv) in one of the above states

(f) Semiconductor memories are widely used because of

(i) their small size

(ii) their low cost

(iii) their compatibility with microprocessors

(iv) All of the above

(g) The logic family with highest noise margin is

(i) I^2L

(ii) HTL

(iii) TTL

(iv) CMOS

2. (a) $(121)_x = (100)_8$; find x. *7*

(b) What do you mean by Gray code ? What are its applications ? *7*

3. (a) Which are the Universal gates ? Show how these can be used for realization of AND, OR and X-OR functions. *7*

(b) Prove that $\overline{\overline{AB} + \overline{A} + AB} = 0$ *7*

4. Draw a 8 : 1 multiplexer circuit and discuss its working. State its use. *14*

5. (a) Explain the working of JK flip-flop. *7*

(b) Enumerate the advantages and disadvantages of a ring counter. Give the circuit diagram and timing diagram for a 3-bit ring counter. *7*

6. (a) With the help of neat diagram explain the working of weighted resistor type DAC. *7*

(b) What are PROMs ? Describe various methods which can be used to erase a PROM. *7*

7. (a) Define following terms : 6

(i) Noise margin

(ii) Fan-out

(b) With neat circuit diagram of TTL NAND gate, explain its operation. 8

8. Write short notes on any ***four*** of the following :

$4 \times 3\frac{1}{2} = 14$

(a) Johnson ring counter

(b) D flip-flop

(c) Shift register

(d) Comparison of different logic families

(e) SRAM