Total number of printed pages–4

1 SEM BCA (CBCS) DD 3

2017

(December)

COMPUTER APPLICATION

Paper : 1·3

(Digital Design)

Full Marks : 60

Time : Three hours

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

1. 1×5=5

(a) Write the truth table for X-NOR gate.

(b) What is the base of the decimal number system?

(c) What is meant by 1's and 2's complements of binary number?

(d) Define Maxterm.

(e) What is Demultiplexing?

Contd.

2. (a) State Demorgan's theorem.

(b) Subtract $(1010)_2$ from $(1111)_2$ using 2's complement method.

(c) What are universal gates? Why they are called as universal gates?

(d) Simplify the given function using Boolean algebra.

$$Y = \overline{A}\overline{B}\overline{C} + \overline{A}B\overline{C} + A\overline{B}\overline{C} + AB\overline{C}$$

(e) State the differences between combinational logic circuit and sequential logic circuit.

2×5=10

3. (a) What are the parity methods for error detection during data communication? Explain with example. 5

Or

Express the function $Y = A + \overline{B}C$ in

(i) Canonical SoP

(ii) Canonical PoS form.

(b) Explain Full Adder circuit with truth table. 5

4. (a) Describe the function of parallel-in, parallel-out shift register with neat logic diagram. 6

Or

Construct 8-to-1 multiplexer with logic diagram and truth table.

(b) Draw and explain 3-to-8 Decoder. 6

5. (a) What is flip flop? Explain the function of a D-flip flop using a suitable diagram. 7

Or

Explain the working principle of J-K Flip Flop.

(b) Simplify the expression using K-map.

$$Y = \sum m(0, 2, 3, 6, 7) + \sum d(8, 10, 11, 15)$$

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6. (a) Draw and explain asynchronous down counter. 7

(b) Convert the following: 1×5=5

(i) Gray code (11001011) to Binary.

(ii) Decimal number 53·625 into equivalent Binary.

(iii) Octal number 199·3 into Binary

(iv) Binary number 101111·1101 into Decimal.

(v) Hexadecimal number AB2 into Octal.
