# 676

## October 2017

_Time – Three hours_
(Maximum Marks: 75)

[N.B: (1) Q.No. 8 in PART – A and Q.No. 16 in PART – B are compulsory. Answer any FOUR questions from the remaining in each PART - A and PART - B.

(2) Answer division (a) or division (b) of each question in PART-C.

(3) Each question carries 2 marks in PART – A, 3 marks in Part – B and 10 marks in PART – C.]

### PART – A

1. Draw the CMOS OR gate circuit.

2. Why CMOS is better than NMOS and PMOS in realisation of gates?

3. Define simulation.

4. What are the types of generating statement?

5. What is a state table?

6. State the types of shift registers used in digital circuits.

7. Write the importance of JK and T flip flops.

8. What are the demerits of PLA?

### PART – B

9. What is a mux? Draw the graphical symbol and truth table of a 4x1 mux.

10. What are hazards? How do you eliminate them in digital circuits?

11. Write the syntax of a simple signal assignment statement with an example.

12. What is an excitation table? Write the excitation table for D-FF.

13. Distinguish between the Mealy machine and Moore machine.

14. Draw the block schematic diagram of CPLD.

15. What is a process statement? Give the syntax of the process statement?

16. Write the VHDL code for D-latch.

[Turn over...

## PART – C

17. (a) What is a decoder? Implement a full adder using a decoder.

(Or)

(b) (i) Implement $f = \sum m(1, 3, 5, 8, 9, 11, 15) + d(2,13)$ with minimal gates.
(ii) Implement the above function using a mux.

18. (a) Write the VHDL code for 1x2 demux. Draw the truth table and the logic diagram of 1x2 demux.

(Or)

(b) Write the VHDL code for 4x2 encoder with truth table.

19. (a) Design a modulo-4 counter from state diagram using D-FF.

(Or)

(b) Design a modulo-7 counter from state diagram using D-FF.

20. (a) Write the VHDL code for T flip flop with or without reset.

(Or)

(b) Write the VHDL code for a decade counter.

21. (a) Implement the function using PLA
(i) $F_1(abc) = \sum m(0, 1, 3, 5)$   (ii) $F_2(abc) = \sum m(3, 5, 7)$

(Or)

(b) (i) Compare PLA and PAL.
(ii) Implement the function $f = \sum m(1, 2, 3, 5, 7)$ in PAL

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