

7. Write short note of the following (any three) : 3×5

- (a) Universal gates ;
- (b) Decoder ;
- (c) Shift Register ;
- (d) Ripple counter ;
- (e) Demultiplexer.

NEW

2017

BCA 1st Semester Examination

DIGITAL ELECTRONICS

PAPER—1104

Full Marks : 70

Time : 3 Hours

*The figures in the right-hand margin indicate full marks.
Candidates are required to give their answers in their
own words as far as practicable.*

Illustrate the answers wherever necessary.

Answer Q. No. 1 and any four from the rest.

1. Answer any five questions : 5×2

- (a) Compare EEPROM and flash memory.
- (b) Simplify the following Boolean expression into one literal
$$W' \times (Z' + YZ) + X(W+YZ).$$
- (c) State De-Morgan's theorem.

- (d) What is edge triggered flip-flop ?
- (e) Define latch.
- (f) List out various applications of multiplexer.
- (g) What is synchronous sequential circuit ?
2. (a) Simplify the following expression using k-map method
 $Y = \sum m(7, 9, 10, 11, 12)$.
- (b) Implement AND logic using NAND gate.
- (c) Convert $(78)_{10}$ to its binary equivalent.
- (d) What is tri-state logic ?
3. (a) Why complement is needed in computer system ?
- (b) Perform : $(53)_{10} - (50)_{10}$ using 2's complement.
- (c) State the difference between Fan-in and Fan-out.
- (d) Draw a half-adder circuit and describe its operations.
4. (a) Represent the decimal number "27" in
 (i) BCD code
 (ii) Octal code
 (iii) Gray code.

- (b) Draw the block diagram of a digital multiplexer and explain its function.
- (c) Give the functional truth table of a 4 : 1 multiplexer and realize it using basic gates AND, OR and NOT.
- (d) Implement the expression using a multiplexer
 $f(A, B, C, D) = \sum m(0, 2, 3, 6, 8, 9, 12, 14)$.
5. (a) Discuss about the design of an odd parity generator.
- (b) What do you mean by race condition in flip-flop ?
- (c) Express the function $Y = A + \bar{B}C$ is a canonical SOP form.
- (d) What is decoder ? Give a block diagram.
6. (a) Implement the Boolean function
 $F = (A, B, C, D) = \sum m(0, 1, 3, 8, 9, 15)$ using two 4-to-1 multiplexer and one OR gate.
- (b) Explain with necessary diagram a BCD to 7 segment display decoder.
- (c) What is overflow ? Give an example.