

(UG1-863)

Roll No.

S.C.No.—2214104

B.C.A. EXAMINATION, 2023

(Main/Re-appear/Improvement)

(First Semester)

DIGITAL ELECTRONICS

22BCA104

Time : 3 Hours

Maximum Marks : 80

Note : Attempt Five questions in all. Q. No. 1 is compulsory. Attempt any four questions selecting one question from each Unit. All questions carry equal marks.

1. Explain the following :

8×2=16

(a) What do you understand by Error detection ?

- (b) Convert $(256)_{10}$ into binary number system.
- (c) What do you understand by De-Morgan's theorem ?
- (d) What is truth table ?
- (e) What are Min-terms ?
- (f) What do you understand by universal gates ?
- (g) What do you understand by combinational circuits in digital electronics ?
- (h) What is Multiplexer ?

Unit I

2. Convert the following :

- (a) Convert the binary number $(01011.1011)_2$ into decimal. 8
- (b) Convert binary to hexadecimal number system : $(110110001010)_2$. 8

3. How is the error detection and correction carried out using parity method in digital data transmission ? 16

Unit II

4. (a) Express the Boolean function $F = A + B'C$ as standard sum of minterms. 8

- (b) Express the Boolean function $F = xy + x'z$ as a product of maxterms. 8

5. Minimize the following expression using K-map. 16

$$f(P, Q, R, S) = \sum m(0, 1, 4, 5, 7, 8, 9, 12, 13, 15)$$

Unit III

6. What are basic logic Gates in digital electronics ? Draw their symbol and truth table. Realize AND, NOT and OR Gate with the help of NAND gate and NOR Gate. 16

7. What are the characteristics of combinational circuits ? Write various steps to design and analyze the combinational circuits with the help of some example. 16

Unit IV

8. (a) Realize the one 16 : 1 multiplexer using four 4×1 Multiplexers. 8
- (b) Realize a full adder using two-half adders. 8
9. What do you understand by code converter ? Draw the circuit diagram of BCD to 7 segment decoder and write its truth table. 16