

BCA (H) 2nd Semester Examination 2022

Subject: Computer Application

Paper Name: Digital Logic

Paper Code: BCA – 201

Time: 4 Hours

Full Marks: 80

Answer Question No. 1 and any four from rest.

16x5 = 80

1. Answer any eight Questions.

8x2 = 16

- a) What are the advantages of OCTAL number system?
 - b) What do you mean BCD?
 - c) What is T flip-flop?
 - d) Define EPROM.
 - e) Simplify the boolean expression $A(A+B)$.
 - f) What are the advantages of K-map?
 - g) When output will go high in NOR Gate?
 - h) Write down hexadecimal equivalent of $(5073.052)_8$.
 - i) Which gates are called universal gates and why?
 - j) Define de-multiplexer.
 - k) What do you mean encoder?
 - l) What is register?
2. Define combinational circuit. What is the difference between Combinational and Sequential circuits? Construct a full-subtractor circuit with suitable diagram. 2+4+10
3. Subtract: $1010.110 - 101.101$ using both 2's and 1's complement. Design a mod-6 counter using T flip flop. Design a 16 X1 multiplexer using 4X1 multiplexer. 5+6+5
4. Define latch. Discuss the working principal of master slave J- K flip flop. Discuss and design a 4 bit shift register. 3+3+10
5. Define cache memory. What do you mean by hit ratio? Discuss direct mapping technique with example. 3+3+10
6. Explain clocked RS flip-flop and T flip flop with its logic diagram and truth table. Design a 3 to 8 line decoder using 2 to 4 line decoder and logic gate. 8+8
7. a) Convert the following from BCD number to Gray code and Excess 3 code.
- i) 10101100
 - ii) 00110001
- b) Implement the following using K-map
- $f(A,B,C,D) = \sum(0,2,6,9,11,13,15)$ 8+8

