Hall Ticket No | | | | | | | | | | | Question Paper Code: AECB03

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech III Semester End Examinations (Regular), February – 2021

Regulation: IARE–R18

DIGITAL ELECTRONICS

Time: 3 Hours **(EEE)** **Max Marks: 70**

Answer any Four Questions from Part A
Answer any Five Questions from Part B

PART – A

1. Explain the number systems in detail with suitable examples. **[5M]**
2. Discuss the operation of parity checker and generator. **[5M]**
3. Write the characteristic equations of SR, JK, D and T flip-flops. **[5M]**
4. Explain the specifications of A/D and D/A converters. **[5M]**
5. Differentiate programmable array logic and programmable logic array. **[5M]**
6. Perform the subtraction using 1's complement method.
   i)$(11010)_2$ – $(10000)_2$
   ii) $(1000100)_2$ – $(1010100)_2$ **[5M]**
7. Explain the working of 2 to 4 decoder and also implement a 2 to 4 decoder using 1 to 2 decoders. **[5M]**
8. Explain how a serial shift register can be transformed into a ring counter. **[5M]**

PART – B

9. Explain what do you mean by error detection and correcting code with examples. **[10M]**
10. Solve the canonical SOP form of the following functions
    i)Y (A, B) = A+B
    ii)Y (A, B, C, D) = AB+ACD **[10M]**
11. Identify all the prime implicants and essential prime implicants for a given function using k-map.
    F(A,B,C,D)=Σm(0,1,2,6,7,8,9,10,15). **[10M]**
12. Design a 4 bit BCD to excess 3 code converter. Draw the logic diagram. **[10M]**
13. Write short notes on shift register? Mention its application along with the serial transfer in 4-bit shift registers? **[10M]**
14. Explain the JK flip-flop with the help of truth table and timing waveforms. **[10M]**

15. Describe the operation of A/D converter with a neat circuit diagram using voltage to frequency method. **[10M]**

16. Discuss weighted resistor converter and R-2R ladder D/A converter with a suitable diagram. **[10M]**

17. Compare logic families of CMOS, TTL and ECL with their specifications. **[10M]**

18. Realizing the following Boolean function using PLA
    1. $f_1(x_3,x_2, x_1, x_0) = \sum$m(0,1,2,5,7 ,10 14),
    2. $f_2(x_3,x_2, x_1, x_0) = \sum$m(1,2,4,6,7,9,11,13) **[10M]**