Code No.: EC302PC | R20 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–B.TECH–I–Semester End Examinations (Regular) - January- 2022
DIGITAL SYSTEM DESIGN
(ECE)

[Time: 3 Hours] **[Max. Marks: 70]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(20 Marks)**

1. a) Convert $(1010110110.1011011)_2$ to Octal and Hexadecimals. [2M]
   b) Draw the Logic symbol and construct the truth table for Three Input OR gate. [2M]
   c) What is a standard POS form? [2M]
   d) What is Hazard? [2M]
   e) In a 6-bit Johnson Counter sequence there are a total of how many States, or Bit patterns? [2M]
   f) What is meant by Race around condition in Flip Flops? [2M]
   g) By how many models are Synchronous sequential circuits represented? Name them. [2M]
   h) What is a Twisted Ring Counter? [2M]
   i) What are the characteristics of Logic families? [2M]
   j) What is TTL and CMOS logic? [2M]

PART-B **(50 Marks)**

2. What is Parity Checking? Explain its necessity and implementation? [10M]

OR

3. Draw the circuit diagrams for each of the following. How can a (i) NAND be used as an Inverter (ii)NOR be used as an Inverter (iii) NOR be used as OR (iv) NAND be used as AND (v) NAND be used as NOR [10M]

4. Simplify the Boolean function using K-map in SOP and POS forms $F=\sum m(0,1,2,4,7,8,12,14,15,16,17,18,20,24,28,30,31)$. [10M]

OR

5. Implement the Full adder using 3-line to 8-line Decoder. [10M]

6. Define the following terms with relation to Flip Flop (i)Setup Time(ii)Hold Time(iii)Propagation Delay Time(iv)Present State(v)Clear State. [10M]

OR

7. Construct a T Flip Flop from a JK Flip Flop and explain its Truth Table. [10M]

8. Design a Synchronous mod-6 Counter using JK-Flip Flops. [10M]

OR

9. Design XS3 to BCD Code Converter using a (i) PROM (ii) PLA and (iii) PAL. [10M]

10. What is significance of Logic families and also mention the types of Logic families? [10M]

OR

11. Construct an exclusive NOR circuit using Transmission Gates and Inverters. [10M]

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