JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS-2022

B.Tech-VIII Semester (ECE)

COURSE CODE (CREDITS): 19B1WEC832 (3) MAX. MARKS: 35

COURSE NAME: CAD ALGORITHMS FOR SYNTHESIS OF DIGITAL SYSTEMS

COURSE INSTRUCTORS: ANUJ KUMAR MAURYA MAX. TIME: 2 Hours

Note: *All questions are compulsory. Marks are indicated against each question in square brackets.*

Q1. What are the limitations of Karnaugh Map? Apply Quine-McCluskey method to realize the following function using NAND gates only. [05]

$$F(w,x,y,z) = \sum m(1,3,7,11,15) + \sum d(0,2,5)$$

Q2. Explain perfect graph. Write the incidence matrix and adjacency matrix for the following graph of Fig 1. [05]

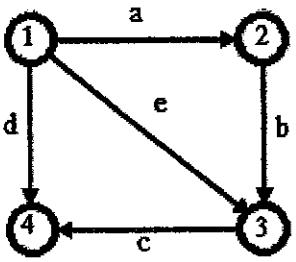

Figure 1: Graph for Q2

Q3. Apply Shanon's expansion on Boolean expression $F(A,B,C) = A\bar{B} + B\bar{C}$ to get its canonical SOP form. Write its min terms and max terms. [05]

Q4. Differentiate BDD, OBDD & ROBDD. Also, draw reduced ordered binary decision diagram for the following Boolean function. Given order is r→q→p. [05]

$$F(p,q,r) = p\bar{q} + q\bar{r}$$

Q5. What is Ashenhurst-Curtis Decomposition? What are the advantages of this technique? [05]

Q6. What do you understand by False-path in VLSI? Explain some common scenario where false-paths can be applied. [05]

Q7. Explain Product term, Sum term, Sum of product term, Product of sum term, Implicant, Prime implicant, Essential prime implicant. Apply iterated consensus method to minimize the function $F(x,y,z) = \bar{x}\bar{z} + xy\bar{z} + x\bar{y}\bar{z} + x\bar{y}z$. [05]