JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2022

B.Tech-VIII Semester (ECE)

COURSE CODE: 19B1WEC832   MAX. MARKS: 25

COURSE NAME: CAD Algorithms for Synthesis of Digital Systems

COURSE CREDITS: 03   MAX. TIME: 1 Hour 30 Min

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

Q1. (a) What are the advantages of binary decision diagram? Also, explain its types.   [2]

(b) Consider the graph of following figure. Explain and draw minimum cover, non-minimum irredundant cover, and redundant cover with reference to this graph.   [3]
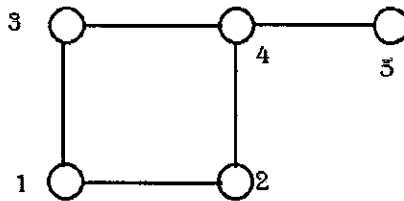

Figure 1: Graph

Q2. Draw the ROBDD for the function $f(a, b, c) = a\bar{b} + \bar{a}bc + ac$ with the given ordering (a, c, b).   [5]

Q3. (a) What do you understand by the Shannon Expansion Theorem? Expand the following function using Shannon Expansion method with order x-y-z.   [3]

$$f(x, y, z) = x + \bar{y}z$$

(b) Explain the names of different ways of Boolean functions representation.   [2]

Q4. (a) What do you understand by decision and optimization problems?   [2.5]

(b) What are the differences between Exact and Heuristic Algorithms?   [2.5]

Q5. What are the advantages of Quine-McCluskey technique of Boolean function minimization? Use this technique to minimize the function: [5]

$$f(a, b, c, d) = \sum m(0, 2, 3, 6, 7, 13, 15) + d(1, 14)$$

where m denotes minterms and d denotes don't care conditions.