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Download editing notes as PDFBoolean Algebra: An algebra of logic related to binary variables and logical operations. Boolean variable: Boolean variable is a symbol. List of axioms and theories: Identity A + 0 = A. 1 = AComplement A + A' = 1 A' = 0Commutative A + B = B.B = B. AAssosiative A + (B + C) = (A + B) + C (B.C) = (A.B) CDistributive A. (B + C) = A.B + A.C A + (B.C) = (A + B) (A + C) Null Element A + 1 = 1 A. 0 = 0 Dedication (A')' = AIndempotency A + A = A A = AAbsorption A + (A.B) = A. (A + B) = A + A Distributed A3 B = A + BDe Morgan's (A + B)' = A' B' (A.B)' = A' Function B'(Boolean The Boolean function can display algebra from the fact table defined by creating minterm, and then apply the OR of all those words. The sum of the product is logical terminology and or two or more OR terms, if each word in the SOP/POS form contains all the letters, then it is a standard expression form. To convert from one standard format to another, switch symbols and list the numbers missing from the original form. Karnaugh (K-map) map is a systematic way to simplify the boolean algebra expression. For reducing expressions defined in SOP format after completing the map k look for a combination of adjascent one.Combine these in a way that is minimally expressive. For reducing expressions in POS forms, we mark zero from the truth table in the map, centralize in a way that minimizes expressions. Product term: as a single letter or logical product of two or more characters (boolean logic application), the door is an electronic system that performs logical operations in a series of input signals. Integrated when applied as a circuit - Use the output of one or more doors and OR together to create the final output. POS expression when applied as a cycle - Use the output of at least one OR door and and together to create the final output. A universal door is a door that can be used for any door use, such as AND, OR and NOT, or a combination of these basic doors. NAND and NOR doors are international gates. Sop expression operation using NAND door only 1) 2) The output of all LEVEL 1 NAND doors is entered into other NAND doors, this will be realized by the expression of SOP3). All characters in the first level door are entered in their optional form.2) Add extra NAND/NOR doors after level 2 doors to get the result. Record cbse class 12 editing and key points in Boolean Algebra Class 12 Computer Science Notes CBSE's quick fix notes for computer science, class 12 chemistry, mathematics, biology and other subjects are very useful in editing all syllabus during the exam day. The editing notes cover all the formulas and important concepts defined in the chapter. Although you want to have an overview of the chapter, quick-fix notes are here so you can do it if for you. 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Short Answer Type Quiz Exam [2 Mark] Question 1: Write The Sum of Products (SOP) of Function F (P, Q, R) For the following fact table display of F: Delhi 2014 Question 2: Write the product of Sum (POS) of function Y, Z) for the following fact table display of F: All India 2014 Answer: – Question 3: Write the sum product model (POS) of function G (U,V,W) for displaying the following fact table of G: Delhi 2013 Question 4: Write the sum of the products (SOP) of the function F(A , B, C) for the following fact table display of F: All India 2013 Question 5: Write a pair of Boolean expressions (A +0) (A.1.) Answer: Using the double principle, change (+) to (.) and vice versa, and by changing 0 with I's and I's with 0's pairs for a given expression are as follows: (A.1) + (A + 0+). Question 6: Give a pair of Boolean functions (Y + Z) + . (+) Answer: The use of double principles, change (+) to (.) and vice versa, and by maintaining a form of variable, such as a pair of expressions, is: (+ Y.Z). Question 7: Seven inverters are stacked one by one What is the output if the input is 1? The logical circuit is given: - Question 8: means F(a, b) = a.b use only not and or doors. Expressions F(a, b) = a.b using only the NOT and OR doors are: Question 9: Find the complement of the following Boolean function, F1 = A.B + .; Question 10: Identifying the distribution laws of the Boolean algebra How are they different from conventional algebra distribution laws? Answer: Boolean algebra state distribution law: X.(Y + Z) = X.Y + X.Z + Y.Z = (X + Y) (X + Y) (X+Z) Law X.(Y + Z) = X.Y + X.Z is based on plain algebra for all values, while X + Y.Z = (X + Y) (X +'Z) responds only to two values (0, 1) of X, Y, and Z. Question 11: How many data sets can be entered in the logical system table with binary input variables (N) Awerns: The 2N input combination can be located in the logic system fact table. Question 12: Why are NAND and NOR doors called universal doors? Answer: NAND and NOR doors are easy to design and basic functions such as AND, OR and NOT etc. can be easily used using NAND/NOR doors, so these doors are called universal doors. Answer: Logical circuit diagram for Boolean expression: A.(B+) Question 14: Draw a logical circuit diagram for boolean expression (B + C) Answer: Logical circuit diagram for Boolean expression: . (B + C) Question 15: Quick P + . Question 16: Draw a logical circuit diagram for the following Boolean expression (+Z) Delhi 2008 Answer: Logical Diagram for Boolean Expression (+Z) Question Type Short Answer [2 Marks] Question 17: Write an equivalent Boolean expression for the following logical circuit: Question 18: Interpreting the following logical circuits as Boolean expressions: Question 19: Check the following by using Boolean law: A + A + .C + B.C 2013 Answer: A + C = A + .C + B.C R.H.S = A + C + B.C = (A +) (A + C)+B.C [using distribution law] = 1. (A + C)+B.C [using A+=1] = A +C+B.C = A+C.(1 +B) = A + C.(1) = A +C [∵1 +B= 1] = L.H.S Question 20: Get a boolean expression for the circuit below: question 21: 21 1 + B = 1] Use NAND door only Answer: Question 22: Represents the expression of Boolean (X +)Z with the help of nand door only, Answer: Boolean expressions (X +) Z can be used as: Question 23: Write an equivalent Boolean expression for the following logical circuit: Question 24: Validate the following Boolean expression using the truth table: (i) X.X = 0 (ii)X+ 1 = 1 All India 2012 Answer: Question 25: The legal name shown below and checked using the fact table Delhi 2014 A +B.C = (A +B) (A + C) Answer: A + B.C = (A + B) (A+C) Because five columns and eight columns are the same, so the law that defines A + B.C = (A + B) (A + C) has been verified. Because the last two columns of the above tmth table are the same, so X + Y=X+Y has been verified. Boolean expression for half adder, sum (S) = A + B Carry (C) = A.B Question 28: Draw a logical circuit for a half adder using only the NAND door Answer: Boolean expression for half adder, sum (S) =A + B Carry (C) = A.B 29: State and legal proof of DeMorgan in algebraBoeleen Delhi 2011C, 2009C, 2008 or DeMorgan state law, check one of DeMorgan's laws using the fact table Delhi 2013C Answer: Refer to the text on page number 303-304 Question 30: Draw a logical circuit diagram for the full adder, provide the truth table for the full adder Answer: Boolean function for full adder question 31: Check the following algebra: . . . Y + X = (+) (X + Y) All India 2010 Answer: Question 32: Provide the following cycle: Question 33: Write an equivalent Boolean expression for the following logical circuits: India 2010 Question 34: Check . . . . + X + = + Use of the Reality Table Delhi 2009 Answer: Question 35: State and check the assimilation law using the fact table All India 2009,2008 Answer: The absorption law states that for boolean variants X and Y, (i) X + X.Y = X (ii) X.(X + Y) = X Question 36: Substitute (P + R) in POS format Delhi 2009C to get pos form, we need to add a product for all input sets that produce output as 0, so P + . B.C + .B. All India 2008 Answer: Question 38: State and review distribution laws in Algebra Bulene Delhi 2008C Answer: Distributed law states: (i) X.(Y + Z) = X.Y + X.Z (ii) X + Y.Z = (X +Y) (X + Z) (X + Z) Validation: (i) Reality Table: X.(Y + Z) = X.Y + X.Z The two columns are the same X.(Y +Z) and X.Y + X.Z are the same ∴ X.(Y + Z) = X.Y + X.Z, so it proved (ii) you (2) the truth table for X + Y.Z = (X + Y) (X + X.Z). X + Z) both columns X + Y.Z and (X + Y) (X + Z) are the same X + Y.Z = (X + Y) (X + Z), so prove question 39: Convert the following boolean expression to the same standard product total format (SOP). Delhi 2008C (+ v +) (u + +) (u + v + w) Answer: Question 40: State and check the relevant laws Answer: Related laws states: (i) X + (Y + Z) = (X + Y) + Z (ii) X.(Y.Z) = (X.Y) Validation Z: (i) Fact Table X + {Y + Z) = (X + Y) + Z Both Columns X + (Y + Z) and (X + Y) + Z Same ∴ X+Z) = (X + Y) + Z Hence (ii) X.(Y.Z) Reality Table = (X.Y) Z Two Columns X.Y(3). Y.Z) and (X.Y) Z are the same X (Y.Z) = (X,Y)Z, therefore proved question 41: Get the following fact table, get the sum of the product (SOP) and sum product model (POS) of boolean expression from it: Question 42: Question 43: Question 44: Circuit design (3 inputs), which yields high results only with low number of inputs or high inputs Answer: High output when the number of input is low or the number of inputs is high, such as question 45: Boolean F function defined in three input variables X, Y, and Z is, if and only if the number of input 1 is odd. Draw a real table for the above functions and display them in the standard SOP format Answer: Fact Table Topics – 2 Maps Karnaugh (K-Map) Short Answer Type Quiz Quiz [3 Mark] Question 1: Get the slightest variation for the expression of the following Boolean using the map of Karnaugh: All India 2014 F(A, B, C, D) = ∑(1,3, 4,5,6,7,12,13) Answer: F (A, B,C, D) = ∑(1,3, 4,5,6,7,12,13) Question 2: Get the smallest format for the following Boolean expressions using the map Karnaugh : H (P, Q, R, S)=∑(0, 1,2, 3, 5, 7, 8, 9, 10, 14, 15) Delhi 2013 Answer: Q3: What is the following Simple Boolean Design Display for Map K: Question 4: Simplifying expressions: Question 5: Reduce the following noise Using map K: F (A, B, C,D) = ∑(2,3, 4,5,6,7,8,10,11) All India 2012 Answer: F (A, B,C, D) = ∑(2,3,4,5,6,7,8,10,11) Question 6: Reduce the expression of the following Booleans using K-map: F(U, V, W, Z) = ∑(0, 1, 2, 4, 5, 6, 8, 10) Answer: F(U,V,W,Z) = ∑(0,1,2,4,5,6,8,10) Question 7: Reduce the following Boolean expressions using K-map: F(A,B, C, D) = ∑(3, 4,5,6,7,13,15) All India 2010 Answer: F (A, B,C,D) = ∑(3,4,5,6,7,13,15) Question 8: Reduce the expression of the following Booleans using K-map: F(A,B,C,D) = ∑(0,1,2,3,4,5,10,10,11,15) Awer: Question 9: Reduce the expression of the following Booleans using K-map: F(P, Q, R, S) = ∑(1,2,3,5,6,7,9,11,12,13,15) Delhi 2009 Answer: F (P,Q, R,S) = ∑(1,2,3 , 5,6,7,9,11,12,13,15) Question 10: Simplify the use of Karnaugh's map for: Question 11: In the K map shown below, which grouping shown in the K-map represents legal grouping? Answer: The group must have cells 2,4, 8, or in a typical cell 2n, either horizontally or vertically, so group A and legal group 12: Draw a Map K and provide a lower SOP expression for the following fact table: Computer Science Question Bank for Computer Science Solutions.

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