IAT-1 ADE

MCQ

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IAT-1

MCQ

1. Each “1” entry in a K-map square represents: * 1 point

- (●) A HIGH for each input truth table condition that produces a HIGH output
- ( ) A HIGH output on the truth table for all LOW input combinations
- ( ) A LOW output for all possible HIGH input conditions
- ( ) A DON’T CARE condition for all possible input truth table combinations

2. The prime implicant which has at least one element that is not present in any other implicant is known as _____ * 1 point

- (●) Essential Prime Implicant
- ( ) Implicant
- ( ) Complement
- ( ) Selective Prime Implicant

3. Looping on a K-map always results in the elimination of _____. * 1 point

- ( ) Variables within the loop that appear only in their complemented form
- ( ) Variables that remain unchanged within the loop
- (●) Variables within the loop that appear in both complemented and uncomplemented form
- ( ) Variables within the loop that appear only in their uncomplemented form

4. The minimum SOP form for the equation F(A,B,C,D)=A'BC+AD+BD'+CD'+AC'+A'B' using Kmap is. * 3 points

- A'+C'+B+D
- A'+C+B'+D'
- A+C+B'+D' (selected)
- A+C'+B+D

5.The minimum POS form for the equation f(w,x,y,z)= ∏ M (4,5,6,7,8,12)+d(1,2,3,9,11,14) is * 3 points

- (w+y')(w'+y'+z')
- (w+y')(w+y+z)
- (w+x')(w'+y+z) (selected)
- (x+y)(w'+y+z)

6 .Simplify the following expression using Quine McCluskey's Method F(A,B,C,D)=Σm(0,3,5,6,7,11,14). i) In Step 2 arrangement of minterms according to the number of 1's include * 1 point

- (●) Three groups , G1 involves the minterms (m0) ,G2 involves the minterms (m3,m5,m6), G3 involves the minterms (m7,m11,m14)
- ( ) Three groups , G1 involves the minterms (m0,m5,) ,G2 involves the minterms (m3,m6,m7), G3 involves the minterms (m11,m14)
- ( ) two groups, G1 involves the minterms (m3,m15,m6), G2 involves the minterms (m7,m11,m14)
- ( ) None of these

6) ii. The obtained Prime implicants are as below * 3 points

- ( ) A'B'C'D', B'CD, A'CD, A'B'CD
- (●) A'B'C'D', B'CD, A'CD, A'BD , BCD'
- ( ) B'CD, A'CD, A'BD , BCD'
- ( ) NONE OF THESE

6)iii. The Minimized expression after finding the essential prime implicants from the prime implicant chart is * 2 points

- (●) A'B'C'D', B'CD, A'BD , BCD'
- ( ) A'B'C'D', B'CD, A'CD, A'BD , BCD'
- ( ) B'CD, A'CD, A'BD , BCD'
- ( ) none of these

7. In K-map simplification, a group of four adjacent 1s leads to a term with * 1 point

- ○ one literal less than the total number of variables
- ◉ two literals less than the total number of variables
- ○ three literals less than the total number of variables
- ○ four literals less than the total number of variables

8.Petrick's method is used to determine _____ expressions * 1 point

- ○ Boolean
- ○ Redundant
- ◉ Irredundant
- ○ None of these

9.What is the form of the Boolean expression (A+B)(C+D) =X * 1 point

- ◉ POS
- ○ SOP
- ○ K-map
- ○ Matrix

10.As the number of variables increases, the number of Prime Implicants and complexity of the Prime Implicant chart * 1 point

- (●) Increases significantly, hence, requires large number of trial and error to find the minimum solution
- ( ) Increases significantly, hence, requires less number of trial and error to find the minimum solution
- ( ) Decreases significantly, hence, requires large number of trial and error to find the minimum solution
- ( ) Decreases significantly, hence, requires less number of trial and error to find the minimum solution

11. Petrick's method reduces the prime implicant chart by * 1 point

- ( ) eliminating prime implicants
- ( ) eliminating redundant implicants
- (●) eliminating essential prime implicants
- ( ) none of these

12.MEV (Map Entered Variables) method is used where Boolean function with _____ number of variables, but few variables having relatively _____ terms association-ship. * 1 point

- ( ) <4, less
- ( ) >4, large
- ( ) <4, large
- (●) >4, less

13. G(A, B, C D, E, F) = m0 + m2 + m3 + Em5+ Em7 + Fm9 + m11 + m15 + d(1, 10, 13). Find the minimum SOP. * 4 points

- A'B' + ACD' + EA'D + FAD
- A'B + ACD + EA'D + FAD
- A'B' + ACD + EA'D' + FAD
- (selected) A'B' + ACD + EA'D + FAD
- Other: .....

14. F(A, B, C, D) = m(2, 3, 7, 9, 11, 13) + d(1, 10, 15) to solve this boolean equation using Quine McCluskey method, we have to encounter _____ number of single element columns in the Prime Implica chart. * 4 points

- 1
- 2
- (selected) 3
- 4

15. In Petrick's method, if two Prime Implicants (PI) are covered by one min-term, then to make the logic function (P) be true (i.e., P = 1), where two levels (L1, L2) associated with each PIs can be reflected in P as: * 1 point

- P = L1*L2
- P = (L1+L2)
- P = L1 or P = L2
- None of these

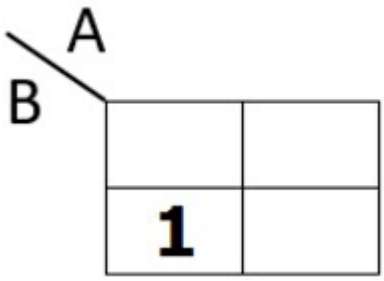
16.F = m(0, 1, 2, 5, 6, 7) this problem creates cyclic prime implicant chart due to _____ numbers of elements in the prime implicant chart. * 3 points

- 0
- 1
- 2
- 3

17. An n variable K-map can have * 1 point

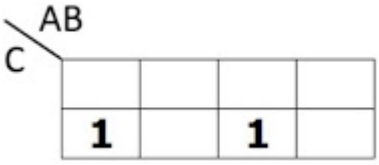
- n^2 cells
- 2^n cells
- n^n cells
- n2^n cells

18.Using the Karnaugh Map, find the logical expression. * 1 point



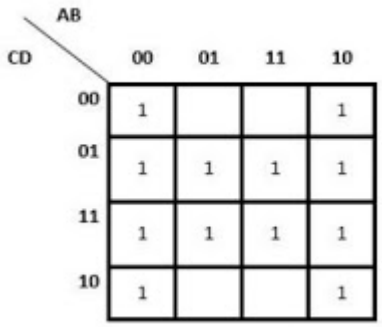
- A'B'
- AB'
- A'B
- AB

19. Using the Karnaugh Map, find the logical expression. 1 point



- A'B'C+ABC
- AB'C'+ABC
- A'BC'+A'BC
- ABC+A'B'C'

20.What is the logic statement from this K map? Do not further simplify. * 2 points



- A'B' + AB + C'D + CD
- A'B + AB
- C'D' + CD'
- B'+D

21.Quine McCluskey method uses * 1 point

- Karnaugh map
- Tabular method
- Boolean algebra
- Graphical Method

22.How many AND gates are required to realize Y = CD+EF+G * 1 point

- [ ] 4
- [ ] 3
- [x] 2
- [ ] 1

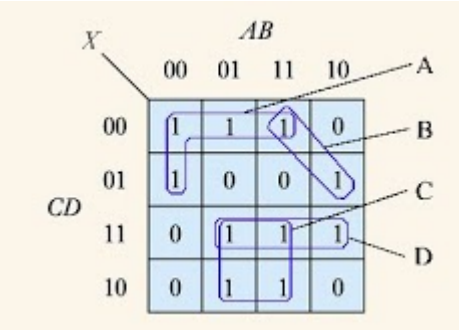
23.A combinational circuit has 3 inputs A, B, C and output F. F is true for following input combinations,(i) A is False, B is True(ii) A is False, C is True(iii) A, B, C are False(iv) A, B, C are True. Find the simplified expression for F in SOP form. * 3 points

- [ ] F = A+BC
- [ ] F = A'+B'C'
- [x] F = A'+BC
- [ ] F = A+B'C'

24. AND-OR realization is equivalent to 1 point

- [x] SOP
- [ ] POS
- [ ] K-MAP
- [ ] Boolean function

25. In the Karnaugh map shown below, which of the loops shown represents a legal grouping? * 1 point



- A
- B
- C
- D

26.In Quine-MC Cluskey the tables containing unchecked term is known as * 1 point

- Prime Implicants
- Selective Implicants
- Even implicants
- Redundant Prime Implicants

27. The Quine-McCluskey method of reducing complex Boolean expressions is used in place of Karnaugh map when the original expression contains _____or more variables * 1 point

- ○ 6
- ○ 8
- ○ 4
- ◉ 5

28. Consider the minterm list form of a Boolean function F given below F(P, Q, R, S) = Σm(0, 2, 5, 7, 9, 11) + d(3, 8, 10, 12, 14) .Here, the number of essential prime implicants of the function F is _____ . * 3 points

- ○ 1
- ○ 2
- ◉ 3
- ○ 4