MFCS Quiz

1. The base case of inequality 7^n>n^3, where n=3, is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 343>27 .
2. PDNF and PCNF of a statement formula are unique
3. Which of the following is a tautology? (P→Q)∨(P∨∼Q)
4. Which of the following hash function is used in the division method? h(k)= k (mod m)
5. A formula consisting of disjunctions of minterms is called \_\_\_\_\_\_\_\_\_\_\_\_ Principal disjunctive normal form
6. Using division method , in a given hash table of size 101, the key value of 205 be placed at position\_\_\_\_\_\_ if even numbered cells and prime numbered cells are already occupied. 9
7. Let P(x) denote x>7.  which of the following has the truth value true? P(8)
8. If f is an onto function then |A| \_\_\_\_\_|B| is greater than or equal to
9. The negation of the statement " John is rich and Rahul is good " is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ John is not rich or Rahul is not good
10. The solution of the recurrence relation S(n) = S(n-1) +2, n>0, given that S(0) =5, is \_\_\_\_\_\_\_ 2n+5
11. P∨(P∧Q)P∨(P∧Q)=\_\_\_\_\_\_\_\_\_\_\_\_\_ P
12. When the  statement formula (P↔R)∨(∼P→∼Q)(P↔R)∨(∼P→∼Q) is false? P is false and Q& R are true
13. n the principle of mathematical induction, which of the following steps is mandatory? Induction hypothesis
14. The converse of the statement " If Rahim plays tennis then David plays cricket " is\_\_\_\_\_ If David plays cricket then Rahim plays tennis
15. For every natural number k, which of the following is true? (mn)^k=m^k.n^k
16. The number of rows in the truth table of a statement formula involving 5 variables is\_\_\_\_\_\_\_ 32
17. Rule P is\_\_\_\_\_\_ A premise may be introduced at any  point of the derivation
18. Which of the following is rule US? From (x) A(x) one can conclude A(y)
19. If f is a 1-1 function from A to B then |A|\_\_\_\_\_\_\_\_\_\_|B| is less than or equal to
20. Let B(x, y) be "y is the best friend of x". Then(∀x)(∃y)(B(x,y)∧(∀z)((z≠y)→∼B(x,z))(∀x)(∃y)(B(x,y)∧(∀z)((z≠y)→∼B(x,z)) represents Every one has exactly one best friend
21. In a lattice (L, +, \*), for a, b in L  a + (a\*b) = \_\_\_\_\_\_\_\_\_ a
22. K-map is also known as\_\_\_\_\_ Veitech diagram
23. If in the sum of product canonical form of a boolean function f on 8 variable has 119 terms, then the product of sum canonical form of f has \_\_\_\_\_\_\_\_\_terms. 137
24. The number of maxterms that can be formed using 7 variables is \_\_\_\_\_\_\_\_\_\_ 49
25. The number of minterms that can be formed using 10 variables is \_\_\_\_\_\_\_\_\_ 1024
26. A family consist of a grand father, five sons and daughter and 8 grand children. They are to be seated in a row for dinner. The grandchildren wish to occupy the four seats at each end and the grandfather refuses to have a grandchild on either side of him. The number of ways in which the family can be made to sit is\_\_\_\_\_\_\_\_\_\_ 8!X480
27. In the bounded lattice ({1,2,3,5,6,10,15,30},D), the complement of 5 is\_\_\_\_\_ 6
28. Don' t care conditions are used in simplifying the boolean expression in\_\_\_\_\_\_\_\_\_\_ K-map method
29. Hasse diagram is a\_\_\_\_\_\_\_\_\_\_\_\_ Diagrammtic representation of a Poset.
30. Which of the following is a chain? S(32, D)
31. In (Z\_7,+\_7)(Z\_7,+\_7) the inverse of the element 2 is 5
32. If all the letters of the word  FAIR are arranged to form 4 letter words such that none of the letters are repeated and the results are arranged in lexicographic order (alphabetical order), the rank of the word FAIR is\_\_\_\_\_\_\_\_\_\_\_ ( Rank of a word is the number of the position of the word) 7
33. There are two brothers among a group of twenty persons. In how many ways can the group be arranged around a circle so that there is exactly one person between the two brothers? 18! X 2
34. The number of six digit numbers that can be formed using the digits 1,2,4,5,8,9 without repetition  is\_\_\_\_\_\_ 720
35. In a bounded lattice, the complement of the least element is the greatest element
36. The number of reflexive relations on a set having n elements is 2^n\*(n - 1)
37. Which of the following is false? Every lattice satisfies distributive property
38. A man positioned at the origin of the coordinate system. He can take steps of unit measure in the direction North, East, West or South. The number of ways he can reach the point (5,6) covering the shortest possible distance. 462
39. The number of 3 digit odd numbers that can be formed using the digits 5,6 , 7, 8, 9 if the digits can be repeateddd 75
40. In a lattice (L, +, \*), for all a in L, a+a=a is called\_\_\_\_\_\_\_\_\_ Idempotent law
41. A tree has at least \_\_\_\_\_\_ leaves 2
42. Which of the following is not a group? The set of all real numbers with respect to the operation usual multiplication
43. Every group of prime order\_\_\_\_\_\_\_\_\_\_\_\_ is cyclic
44. The kernel of a group homomorphism f:G→Hf:G→H is non-empty because f takes identity element to identity element
45. Which of the following is true? Subgroup need not contain the identity element.
46. Which of the following statement is false?

* The identity element of a group is unique.
* The inverse of an element of a group is unique.
* There is no idempotent element in a group
* The only idempotent element of a group is the identity element

1. The complete graph on 3 vertices has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hamiltonian cycles. 6
2. If H is a subgroup of an abelian group G then which of the following is false? Ha#aH, for all a in G
3. Which of the following is true? Every cyclic group is abelian
4. If G is a group such that for all a, b in G, (ab)^2=a^2b^2 then G is\_\_\_\_\_\_\_\_\_\_ an abelian group
5. The complete bipartite graph Km,nKm,nis Hamiltonian iff \_\_\_\_\_\_\_\_\_ m=n
6. Which of the following is the statement of Lagrange' s theorem The order of a sub group of a finite group divides the order of the group.
7. A directed graph is weakly connected if its underlying graph is connected
8. Let F be a homomorphism from a group G into a group H and K be its kernel. If e and f are identity elements of G and H respectively, then for all a in K F(a)=\_\_\_\_\_\_\_\_\_\_ f
9. Let a and b be elements of a group G such that the inverse of a is b then the inverse of b is\_\_\_\_ a
10. The cancellation laws hold good in any group
11. Which of the following statement is true? A graph G is Euler if and only if every vertex is of even degree.
12. A graph is not Euler if it does not contain an Euler cycle
13. If G is a rooted tree with root u and if the vertex v is at level 4 then d(u,v) is Equal to 4
14. Which of the following is the subgroup of a group G={1, -1, i, -i} with respect to the operation usual multiplication? {1, -1}