Model Paper MFCA

Q1 : The rule of inference used in the following argument is

If Sachin hits a century, he gets a free car.
Sachin has hit a century.

∴ Sachin gets a free car.

    a. Rule of Syllogism
    b. Rule of Modus Ponens
    c. Rules of Modus Tollen
    d. Rule of Disjunctive Syllogism

Q2 : The negation of the statement: "If a quadrilateral is a parallelogram, then its diagonals bisect each other" is ?

    a. Quadrilateral is not a parallelogram or its diagonals bisect each other
    b. Quadrilateral is not a parallelogram and its diagonals bisect each other
    c. Quadrilateral is a parallelogram or its diagonals bisect each other
    d. Quadrilateral is a parallelogram and its diagonals bisect each other

Q3 : $p \vee (q \wedge r)$ is logically equivalent to ?

    a. $(p \vee q) \vee (p \vee r)$
    b. $(p \wedge q) \vee (p \wedge r)$
    c. $(p \vee q) \wedge (p \vee r)$
    d. $(p \vee q) \wedge (p \wedge r)$

Q4 : Let $A = \{x: x^2 - 7x + 12 = 0\}$ and $B = \{1,2\}$ then $A \cup B$ is ?

    a. {1,2, 3, -4}
    b. {1,2,3,4}
    c. {1,2, -3, -4}
    d. {1,2, -3, 4}

Q5 : If $A - B = \{1,2,4\}$, $B - A = \{7,8\}$ and $A \cup B = \{1,2,4,5,7,8,9\}$, then A is ?

    a. {1,2,4,5,9}
    b. {1,2,4,7,8}
    c. {1,2,4}
    d. {7,8}

Q6 : If A and B are mutually exclusive events, then
$P(A \cup B) = ?$

    a. $P(A) - P(B)$
    b. $P(A) \cdot P(B)$
    c. $P(A) + P(B)$

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d. 0

Q7 : When a coin is tossed twice, then the probability that both are heads is ?

    a. **¼**

    b. ½

    c. ¾

    d. ⅔

Q8 : When a coin is tossed thrice, then the probability of getting at least one head is ?

    a. ⅛

    b. **⅞**

    c. ¾

    d. ½

Q9 : Recursive definition of $a_n = 4^n$ is ?

    a. a_1 **= 4 and** a_n **=** $4a_{n-1}$

    b. $a_1 = 4$ and $a_n = 4 + a_{n-1}$

    c. $a_1 = 4$ and $a_n = 4 - a_{n-1}$

    d. $a_1 = 4$ and $an = an-1$

Q10 : The recursive definition of $an = 5n$ is ?

    a. a_1 **= 5 and** $an = an-1 + 5$

    b. $a_1 = 5$ and $an = an-1 - 5$

    c. $a_1 = 5$ and $an = an-1$

    d. $a_1 = 5$ and $an = 5an-1$

Q11 : If $\sum(n \cdot (n + 2)) = n(n+1)(2n+7)/6$, Then, $1*3 + 2*4 + \ldots + 15*17 = ?$

    a. 1840

    b. **1480**

    c. 1408

    d. 1084

Q12 : The number of license plates that can be made where each plate contains 2 distinct English letters followed by 2 different digits other than 0 is ?

    a. **46800**

    b. 48600

    c. 40860

    d. 48060

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Q13 : A bit is either 0 or 1. A byte is a sequence of 8 bits. Total number of bytes that begin and end with 11 is ?

   a. **16**
   b. 256
   c. 128
   d. 32

Q14 : Total six digit numbers that can be made using 1,3,3,7,7,8 is ?

   a. 178
   b. 179
   c. 176
   d. **180**

Q15 : Simplified value of $(x + 1)^4 - (x - 1)^4$ is ?

   a. **$8(x^3 + x)$**
   b. $8(x^3 - x)$
   c. $4(x^3 + x)$
   d. $4(x^3 - x)$

Q16 : Coefficient of $x^3 y^2$ in the expansion of the function $(2x + 3y)^5$ is ?

   a. 702
   b. 270
   c. **720**
   d. 207

Q17 : Total ways in which 10 identical marbles are distributed among 6 different containers is ?

   a. **3003**
   b. 3300
   c. 3330
   d. 3133

Q18 : A relation in which no element is related to itself is ?

   a. Reflexive relation
   b. Symmetric relation
   c. **Irreflexive relation**
   d. Transitive relation

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Q19 : Let A={1,2,3} and R be a relation on A defined by R={(1,1),(2,2),(3,3),(2,1). Then R is ?

    a. Reflexive and Symmetric
    b. Reflexive and not Symmetric
    c. Symmetric and not Reflexive
    d. Neither Symmetric nor Reflexive

Q20 : If $f: A \rightarrow B$ is a function such that every element of B has a pre- image, then the function f is known as ?

    a. One one function
    b. Many one function
    c. Onto function
    d. Into function

Q21 : A discrete probability distribution is given by the following table. The value of k is

x	1	2	3	4
$p(x)$	$3k$	$2k$	$3k$	$7k$

    a. 1/14
    b. 1/12
    c. 1/15
    d. 1/16

Q22 : A discrete probability distribution is given by the following table: The value of mean is

x	1	2	3
$p(x)$	0.25	0.25	0. 50

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a. 2.375
b. **2.25**
c. 2.52
d. 2.573

Q23 : A discrete probability distribution is given by the following table:

x	1	2	3
$p(x)$	0.4	0.3	0.3

The value of $E(x^2)$ is ?

a. 5.3
b. **4.3**
c. 2.3
d. 3.3

Q24 : $\sigma^2 + \mu^2 = ?$

a. **$E(x^2)$**
b. $E(x^3)$
c. $E(x^4)$
d. $E(x)$

Q25 : In a walk, if the initial and terminal vertices are same, then it is said to be ?

a. Open
b. **Closed**
c. A Path
d. A cycle

Q26 : A tree has 20 vertices. Total edges in this tree is ?

a. 21
b. 20
c. **19**
d. 10

Q27 : Suppose V is a pendant vertex of a graph, then its degree is ?
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a. **1**
b. 0
c. 2
d. 3

Q28 : (Mean – Mode) is equal to ?

    a. **3 (Mean – Median)**
    b. 2 (Median – Mode)
    c. 4 (Median – Mode)
    d. 5 (Median – Mode)

Q29 : We need to find the angle of each sector of a Pie chart. The formula to be used is ?

    a. (Component part/Total) X 100
    b. (Component part/Total) X Pi
    c. (Total/Component part) X 360
    d. **(Component part/Total) X 360**

Q30 : Square of Geometric mean is ?

    a. **Product of Arithmetic mean and harmonic mean**
    b. Difference of Arithmetic mean and geometric mean
    c. Sum of Arithmetic mean and geometric mean
    d. Half of the product of Arithmetic mean and geometric mean

Q31 : The equations used to fit a curve are called ?
    a. Characteristic equation
    b. **Normal equation**
    c. Auxiliary equation
    d. Fundamental equation

Q32 : Total number of equations in fitting a parabola to is ?
    a. 1
    b. 2
    c. **3**
    d. 4

Q33 : $21a + 7b = 14$ and $91a + 21b = 98$ are equations to fit a straight line. The values of a and b are ?
    a. 2 and 4
    b. -2 and 4
    c. **2 and -4**
    d. -2 and -4

Q34 : In a class, 30 students study Physics, 40 study Math and 15 study both Math and Physics. Total students in the class are ?
   a. 50
   b. 55
   c. 60
   d. 65

Q35 : In a box containing 100 bulbs 10 are defective. The probability that out of 5 bulbs none is defective is ?
   a. 1^(-10)
   b. 0.1^5
   c. 0.9^5
   d. 9^(-10)

Q36 : If A and B are independent events then **P(A intersection B)** is ?
   a. P(A) + P(B)
   b. P(A) * P(B)
   c. 0
   d. P(A) - P(B)

Q37 : In a graph, the sum of degrees of all vertices is ?
   a. Thrice the number of edges
   b. Equal to the number of edges
   c. Twice the number of edges
   d. Four times the number of edges

Q38 : A Euler circuit of a graph contains ?
   a. Only all vertices of the graph
   b. Only few edges of the graph
   c. Only few vertices of the graph
   d. All vertices and all edges of the graph.

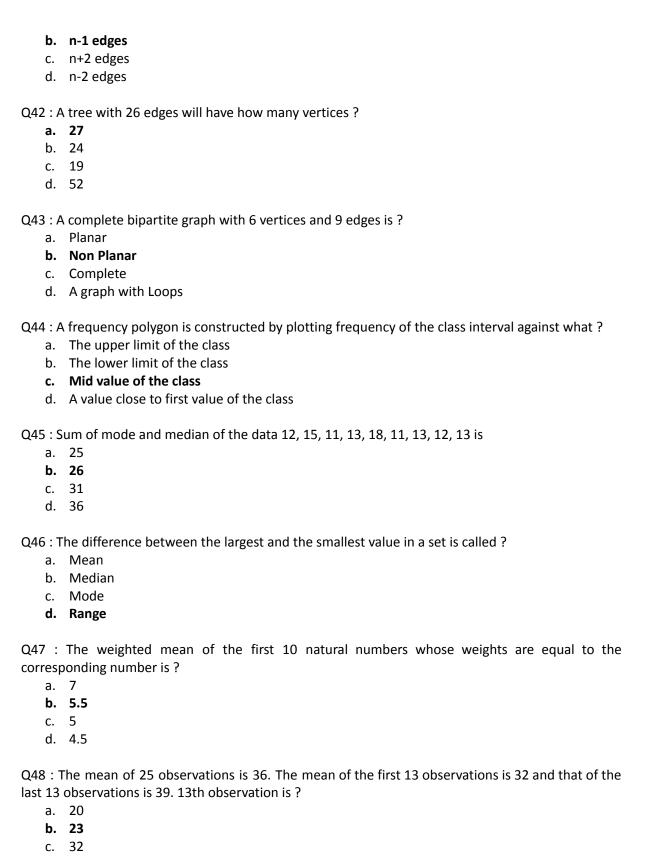Q39 : A planar graph has 17 vertices, 34 edges. Then the number of regions is ?
   a. 17
   b. 19
   c. 21
   d. 23

Q40 : In a properly coloured graph ?
   a. Adjacent vertices will have same color
   b. Non Adjacent vertices will have same color
   c. Adjacent vertices will not have same color
   d. Non Adjacent vertices need not have same color

Q41 : A tree with n vertices will have ?
   a. n+1 edges

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b. **n-1 edges**
c. n+2 edges
d. n-2 edges

Q42 : A tree with 26 edges will have how many vertices ?
a. **27**
b. 24
c. 19
d. 52

Q43 : A complete bipartite graph with 6 vertices and 9 edges is ?
a. Planar
b. **Non Planar**
c. Complete
d. A graph with Loops

Q44 : A frequency polygon is constructed by plotting frequency of the class interval against what ?
a. The upper limit of the class
b. The lower limit of the class
c. **Mid value of the class**
d. A value close to first value of the class

Q45 : Sum of mode and median of the data 12, 15, 11, 13, 18, 11, 13, 12, 13 is
a. 25
b. **26**
c. 31
d. 36

Q46 : The difference between the largest and the smallest value in a set is called ?
a. Mean
b. Median
c. Mode
d. **Range**

Q47 : The weighted mean of the first 10 natural numbers whose weights are equal to the corresponding number is ?
a. 7
b. **5.5**
c. 5
d. 4.5

Q48 : The mean of 25 observations is 36. The mean of the first 13 observations is 32 and that of the last 13 observations is 39. 13th observation is ?
a. 20
b. **23**
c. 32

d. 40

Q49 : The arithmetic mean of a set of 10 numbers is 20. If each number is first multiplied by 2 and then increased by 5, then the mean of new numbers is ?
   a. 20
   b. 25
   c. 40
   d. 45

Q50 : The observation with the highest frequency is called ?
   a. Mean
   b. Median
   c. Mode
   d. Range

Q51 : In a planar representation, a region is called a ?
   a. Vertex
   b. Face
   c. Cover
   d. Edge

Q52 : A spanning tree of a graph contains ?
   a. All vertices
   b. All edges
   c. Few Vertices
   d. Few Edges

Q53 : In a graph, the total number of vertices of odd degree is always ?
   a. Even number
   b. Odd number
   c. Any Integer number
   d. Any real number

Q54 : If two graphs are isomorphic, then both graphs ?
   a. Equal vertices
   b. Vertices in one graph will be one less than the vertices in the other
   c. Edges in one graph will be one less than the vertices in the other
   d. Unequal number of vertices

Q55 : In a graph, an edge which is drawn from vertex to itself is called a ?
   a. Edge
   b. Line
   c. Point
   d. Loop

Q56 : A random variable X takes the values 0, 1 and 2. P(X=1) = P(X=2). And P(X=0) = 0.4. Then the mean of X is ?

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a. **0.9**
b. 0.2
c. 0.5
d. 0.7

Q57 : Divisibility relation is ?
a. Reflexive and symmetric
b. **Reflexive and transitive**
c. Symmetric and transitive
d. Reflexive, symmetric and transitive

Q58 : If 5 colors are used to paint 26 doors, then how many doors will have the same color ?
a. Exactly 6 doors
b. **At least 6 doos**
c. Exactly 7 doors
d. At least 7 doors

Q59 : Total permutations of the letters of the word BANANA are ?
a. 60
b. 180
c. 120
d. 140

Q60 : Let A = {1,2}, B = {3,4} and C = {4,5}, then(A-B) X (B-C) is ?
a. **{(1,3), (2,3)}**
b. {(2,3), (2,4)}
c. {(1,3), (1,4)}
d. {(1,4), (2,3)}