

# MTH202 QUIZ 3 UPDATED

## SEARCHING FILE 2021

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98% CORRECT

1. If A and B are disjoint sets then  $P(A \mid B) = \dots\dots\dots$

P(A)

2. If B is a subset of A then  $P(A/B) = 1$

True

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3.  $P(A^C/B) = 1 - P(A/B)$

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True

4. If A and B be events with  $P(A) = 1/3$ ,  $P(B) = 1/4$  and  $P(A \text{ intersection } b) = 1/6$ , then  $P(A \cup B) = \dots\dots\dots$ .

5/12

5.  $P(A/B) = P(A \cap b)/P(B)$ , where  $\dots\dots\dots$ .

$P(B) > 0$

6. Total degree of a graph G is  $\dots\dots\dots$ .

2(Number of edges of G)

7. Let  $E(X^2) = 6$ ,  $\mu^2 = 2$ , then standard deviation is  $\dots\dots\dots$ .

2

8. If A and B be events with  $P(A) = 1/3$ ,  $P(B) = 1/4$  and  $P(A \text{ intersection } b) = 1/6$ , then  $P(A/B) = \dots\dots\dots$

2/3

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9. A closed walk is the walk that starts and ends at the same vertex

True

10. Total degree of G is an odd number

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False

11. If X and Y are random variable, then  $E(aX)$  is equal to

$aE(X)$

12. A simple graph is a graph that does not have any loop.

True

13. Conditional probability of A given B is defined as \_\_\_\_\_.

$P(A \cap B) / P(B)$

14. If X and Y are independent random variables and a and b are constant, then  $\text{Var}(aX+bY)$  is equal to

$a^2 \text{Var}(X) + b^2 \text{Var}(Y)$

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15. A random variable is also called a

Chance variable

16. If the random variable X denotes the number of heads when three distinct coins are tossed, then X assumes the value

0,1,2,3

17. If X and Y are random variables, then  $E(X-Y)$  is equal to

$E(X) - E(Y)$

18. A random variable is also called a Stochastic variable

True

19. Which of the followings is the probability of getting a 6 when a dice is tossed?

1/6

20. A random variable is also called a

Chance variable or stochastic variable

21. If  $E(5)=5$ , then find arithmetic mean will be

5

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22. Conditional probability of B given A is defined as \_\_\_\_\_.

$$P(A \cap B) / P(A)$$

23. If A is a subset of B then  $P(A \cap B) = P(A)/P(B)$

True

24. A graph is regular if every vertex has the \_\_\_\_\_ degree

Same

25. If the standard deviation of the data set is 4 then the value of the variance is

16

26. What is the probability of the number of one head when two fair coins are tossed?

2/4

27. A simple graph is a graph that does not have any loop

True

28. If A and B are disjoint sets then  $P(A/B) =$  \_\_\_\_\_?

P(A)

29. A complete graph on n vertices is a simple graph in which every is connected to every other vertex.

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True VUAnswer.com

30. There are three bus lines between A and B, and two bus lines between B and C. Find the number of ways a person can travel round trip by bus from A to C by way of B?

6

31. Which of the followings is the product set  $A * B * C$ ? where  $A = \{a\}$ ,  $B = \{b\}$ , and  $C = \{c, d\}$

$\{(a, b, c), (a, b, d)\}$

32. In how many ways can 6 people be seated on 6 available seats?

720

33. Among 20 people, 15 either swim or jog or both. If 5 swim and 6 swim and jog, how many jog?

16

34. Compute  $C(8, 3)$

56

35. Let  $X=\{1,2,3\}$ , then 2-combinations of the 3 elements of the set  $X$  are \_\_\_\_\_?

$\{1,2\}, \{1,3\}$  and  $\{2,3\}$

36.  $P(A \cap B) = P(A) \cdot P(A/B)$

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False

37. If  $B$  is a subset of  $A$  then  $P(A/B) = 1$

True

38. An expected value of a random variable is equal to its mean

True

39. If  $X$  and  $Y$  are independent random variables, then  $E(XY)$  is equal to

$E(x)E(y)$

40. A random variable is also called stochastic variable

True

41. If  $A$  and  $B$  are two independent events then  $P(A \cap B) =$

$P(A)P(B)$

42. If  $X$  is a discrete random variable and  $f(x)$  is the probability of  $X$ , then the expected value of this random variable is equal to;

$\sum xf(x)$

43. The expected value  $E(X)$  is obtained by multiplying each value of  $X$  by its probability and taking the sum.

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True

44.  $P(A, A) = \underline{\hspace{2cm}}$ .

1

45. Which of the followings is the factorial form of  $5 \cdot 4$ ?

$5!/3!$

46. The set of prime numbers is                     .

Infinite set

47. Let  $R$  be a relation on a set  $A$ . If  $R$  is symmetric then its compliment is                     .

Irreflexive

48. There are 4 bus lines between  $X$  and  $Y$ , and 5 bus lines between  $Y$  and  $Z$ , the number of ways a person can travel from  $X$  to  $Z$ ?

20

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49. To prove by mathematical induction inductive step is                     .

If  $P(K)$  is true then  $P(K + 1)$  is true for all integers  $K \geq 1$

50. Algorithm is a more general term in that the term      refers to a particular programming language.

Program

51. The sum of rational and irrational number                     .

Is always an irrational number

52. Basis and Inductive steps are part of proof by     .

Mathematical induction

53. Reductio and absurdum is another name of     .

**Proof by contradiction**

54. If one event can occur in  $n_1$  ways a second event can occur in  $n_2$  ways, a third event can occur in  $n_3$  ways, how ways all of the events can occur in the order

$$N_1+n_2+n_3$$

55. A non zero integer  $d$  divides an integer  $n$  if and only if there exists an integer  $k$  such that \_\_\_\_\_

$$N=dk$$

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56. The sequence  $1+2+3+4 + \dots + n$  is equal to \_\_\_\_\_.

$$N(n+1)/2$$

57. The sum of two integers is not an even integer when \_\_\_\_\_.

**One is even and one is odd**

58. To prove by mathematical induction for  $1+2+3+\dots+n=(n)(n+1)/2$  for all positive integers, the basis step is \_\_\_\_\_.

$$1=(1)(1+1)/2$$

59. To prove by mathematical induction for  $1+5+9+\dots+(4n-3)=n(2n-1)$  for all positive integers, the inductive step is true for  $n=k$  is \_\_\_\_\_.

$$1+5+9+\dots+(4k-3)=k(2k-1)$$

60. Proof by \_\_\_\_\_ uses the equivalence  $p \rightarrow q = \sim q \rightarrow \sim p$

**Contraposition**

61. The predicate which describes the initial state is called the \_\_\_\_\_ of the algorithm

**Pre-condition**

62. The last step of describing algorithms formally is?

**An end statement**

63. Which of the following is not a method to prove the mathematical statements?

**Permutation**

64. GCD of (330,156) is?

**6**

65. Which of the following is not an irrational number?

Square root(4)

66. The sum of a rational and irrational number \_\_\_\_.

Is always an irrational number

67. If  $n$  is an odd integer then  $n^3+n$  is \_\_\_\_\_.

Even

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68. The \_\_\_\_ of a predicate variable is the set of all values that may be submitted in place of the variable

Domain

69. For all positive real numbers  $a$  and  $b$  if  $a < b$ , then \_\_\_\_\_.

$A^2 < b^2$

70. For every prime number  $n$ ,  $n+2$  is prime. Which of the following prime number disproves the above statement.

$N=7$

71. The set of prime number is \_\_\_\_\_.

Infinite set

72. An integer  $n$  is \_ if it can be represented as a multiple of 2

Even

73. In inductive property the first iteration of the loop is solved for?

$I(K)$

74. Which of the following is not a method to prove the mathematical statements?

permutation

75. In how many ways a student can choose a course from 2 science courses 3 literature courses and 5 art courses

10

Type text here

76. In the Direct Proof, we show that if the statement p is true, then the statement q is \_\_\_\_\_.

True

77. Which of the following is true for  $n = 2$  ?

$X^n - y^n$  is divisible by  $(x - y)^2$

78. The sum of any rational number and any irrational number is irrational.

True

79. The set of prime numbers is \_\_\_\_\_.

Infinite set

80. The sum of two odd integers is \_\_\_\_\_.

Even

81. How many multiples of 5 are there from 10 to 75?

14

82. A bit string is a sequence of 0's and 1's.

True

83. The method of loop invariants is used to prove \_\_\_\_\_ of a loop with respect to certain pre and post-conditions.

Correctness

84. \_\_\_\_\_ is used to determine number of ordered or unordered arrangement of objects

Counting

Counting is used to:

- Determine number of ordered or unordered arrangement of objects.
- Generate all the arrangements of a specified kind which is important in computer simulations.
- Compute probabilities of events.
- Analyze the chance of winning games, lotteries etc.
- 5) Determine the complexity of algorithms.

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85. Which of the following is not a rational number.

$$\sqrt{7}$$

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86. While proofing by contradiction the equivalence \_\_\_\_\_ is used.

$$p \rightarrow q \equiv (p \wedge \sim q) \rightarrow c$$

87. While proofing by contraposition the equivalence \_\_\_\_\_ is used

$$p \rightarrow q \equiv \sim q \rightarrow \sim p$$

88. Proof by contradiction is a/an \_\_\_\_ method of proof.

Indirect

89. Proof by contraposition is a/an \_\_\_\_ method of proof.

Indirect

90. If n is divisible by 5, then  $n^2$  is divisible by 25 is the contraposition of \_\_\_\_\_.

$N^2$  is not divisible by 25, then n is not divisible by 5

91. The quantity  $a - d \cdot q$  equals the ?

Remainder

92. In inductive step of proof by mathematical induction, the assumption is made for \_\_\_\_\_.

$$N=k+1$$

93. How many 4-bit string contain at least one '1'

16

94. For all integers  $n > 0$

$$1+2+2^2+\dots+2^n = \underline{\hspace{2cm}}$$

$$2^{(n+1)} - 1$$

95. The chairs of an auditorium are to be labeled with two characters, a letter followed by a digit. Letters are a and b and numbers are 3 and 5. What is the largest number of chairs that can be labeled differently?

15

96. To prove by mathematical induction for  $1+5+9+\dots+(4n-3)=n(2n-1)$  for all positive integers, the basis step is \_\_\_\_\_.

$$1=1(2(1)-1)$$

97. The predicate describing the final state is called \_\_\_\_\_.

Post condition of the algorithm

98. The predicate describing the initial state is called \_\_\_\_\_.

Pre-condition of the algorithm

99. If  $n$  is any positive integer then  $2^n \geq 2(n+1)$  is true for all \_\_\_\_\_.

$$N \geq 3$$

100. The sum of  $(6 - 7 \text{ under root } (2))$  and  $(6 + 7 \text{ under root } (2))$  is

12

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101. GCD of (8, 12) will be \_\_\_\_\_.

4

102. In division algorithm 'r' stands for \_\_\_\_\_

Remainder

103. If the sum of two integers is even then their difference would be \_\_\_\_\_.

Even

104. Which of the following is true for  $n=1$ ?

$$2^{(2n)} - 1 \text{ by } 3$$

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105. To prove by mathematical induction for  $1+3+5+\dots+(2n-1)=n^2$  for all positive integers, the basis step is \_\_\_\_\_.

$$\text{LHS} = p(1) = 2 \times 1 = 1, \text{ RHS} = 1^2 = 1$$

106. The loop is correct if the four properties are true, one of the property is?

Eventual feisty of guard

107. The statement  $n^2 > n + 3$  is true when \_\_\_\_\_.

$$N \geq 3$$

108. If 'n' is an odd integer then  $n^3+n$  is \_\_\_\_\_.

Even

109.  $(-1)^n = 1$  for  $n =$  ( ^standard for power )

4

110. A boy can choose from 5 train services and 3 bus service to go to his hometown, How many total options he can choose from?

8

111. The method of loop invariants is based on the people of \_\_\_\_\_.

Division algorithm

112. The statement  $3^n < n!$  is true when \_\_\_\_\_.

$$n > 6$$

113. In a city, the bus route numbers consists of a natural number less than 20, followed by one of the letters A,B,C,D,E and F. How many different bus routes are possible

114

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114. The word algorithm refers to a step-by-step method for performing some action.

True

115. If  $n$  is an odd integer then  $3n+2$  is \_\_\_\_\_.

Odd

116. To prove by mathematical induction basis step is \_\_\_\_\_.

The proposition  $P(1)$  is true

117. There are 5 Chinese books and 6 English books, a student wants to select one optional book for both subject, total number of choices will be

30

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118. In division algorithm the pre-condition is?

$A$  is a nonnegative integer and  $d$  is a positive integer

119. If there are 5 different optional courses in English and 3 different optional in Maths. Choices for a student who to take one optional.

8

120. Number of combination of 3-bit string that contain exactly there '0' is \_\_\_\_\_.

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8

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121. The sequence  $1^3+2^3+3^3+\dots+n^3 =$  \_\_\_\_\_.

$N(n+1)(2n+1)/6$

122. If ' $r$ ' is a perfect square, then which of the following is the correct representation of ' $r$ '?

$R=k^2$  for some integer  $k$

123. Which of the following is the representation of an odd integer ' $n$ '?

$N=2k+1$  for some integer

124. If  $n$  is any positive integer then the sequence  $3+6+9+\dots+3n=$ \_\_\_\_\_.

$$3n(n+1)/2$$

125. A predicate becomes \_\_\_\_\_ when its variables are given specific values.

Sentence

126. The greatest common divisor (gcd) of two integers  $a$  and  $b$  is the largest integer that divides both  $a$  and  $b$ . it is called \_\_\_\_\_.

EUCLIDEAN ALGORITHM

127. A predicate is a sentence that contains a finite number of\_\_\_\_\_.

Variables

128. A proof by \_\_\_\_\_ is based on the fact that either a statement is true or it is false but not both.

Contradiction

129. The \_\_\_\_\_ of a predicate variable is the set of all values that may be substituted in place of the variable

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Domain

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130. Which of the following statement is true according to the division algorithm?

$$17=15 \times 3 + 2$$

131. The division by zero is allowed in mathematics

True

132. A student can choose a computer project from one of the two lists. The two lists contain 12 and 18 possible projects, respectively. How many possible projects are there to choose from?

30

133. For integers  $a,b,c$  if  $a$  divides  $b$  and  $a$  divides  $c$ , then  $a$  divides  $(a + b)$

True

134. Suppose there are different tea flavors and 5 different biscuit brands. A guest wants to take one tea and one brand of biscuit. How many choices are there for this guest?

13

135. The sequence  $1+2+3+4+\dots+n$  is equal to \_\_\_\_\_.

$N(n+1)/2$

136. The product of two odd integers is \_\_\_\_\_.

odd

137. A student has 3 optional courses in mathematics and 5 optional courses in physics, how many total choices for him to take one course?

8

138. If the square of an integer is even, then that integer is \_\_\_\_\_.

Even

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139. The first step of describing algorithm formally is?

The name of the algorithm, together with a list of input and output variables

140. Set of prime numbers is finite.

false

141. The sum of two irrational numbers in general \_\_\_\_\_.

Is always a rational number

142. Which of the following is the representation of an odd integer 'n'?

$N=2k+1$  for some integer 'k'

143. In how many ways can 6 people be seated on 6 available seats?

12

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**Algorithms formally:**

- 1.The name of the algorithm, together with a list of input and output variables.**
- 2.A brief description of how the algorithm works.**
- 3.The input variable names, labeled by data type.**
- 4.The statements that make the body of the algorithm, with explanatory comments.**
- 5.The output variable names, labeled by data type.**
- 6.An end statement.**

**144. The product of an even and odd integer is \_\_\_\_\_.**

**Even**

**144. In the direct proof, we show that if the statement p is true then the statement q is \_\_\_\_\_.**

**True**

**145. \_\_\_\_\_ is the mathematics of counting and arranging objects**

**Combinatorics**

**146. The Contrapositive of ‘5n+2’ is odd, then n is odd is**

**If n is even then 5n+2 is even**

**147. For All positive real numbers a and b, if  $a < b$ , then \_\_\_\_.**

**$A^2 < b^2$**

**148. The rational number ‘2’ is the product of which of the two irrational numbers.**

**Under root(2), under root(2)**

**149. The sum of two integers is even when \_\_\_\_\_.**

**Both are even or both are odd**

**150. Proof by contraposition is based on the logical equivalence between a statement and its.**

**contrapositive**

**151. The sum of two irrational numbers must be an irrational number.**

**False**

**152. In how many ways a student can choose a course from 2 science courses, 3 literature courses and 5 art courses.**

**10**





1. The statement  $p \rightarrow q$  is logically equivalent to  $\sim q \rightarrow \sim p$

1. True

2. False

2. Suppose there are 8 different tea flavors and 5 different biscuit brands. A guest wants to take one tea and one brand of biscuit. How many choices are there for this guest?

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1. 5

2. 8

3. 13

4. 40

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3. The number of the words that can be formed from the letters of the word, "COMMITTEE" are

1.  $9p9$

2.  $9C9$

3.  $9! / (2!2!2!)$

4. None of the given

4. If order matters and repetition is allowed, then which counting method should be used in order to select 'k' elements from a total of 'n' elements?

1. K-Selection

2. K-Sample

3. K-combination

4. K-Permuatation

5.  $( p \vee \sim p )$  is the \_\_\_\_\_.

1. Contradiction

2. Conjunction

3. Tautology

4. Contingency

6. The logical statement  $p \wedge q$  means \_\_\_\_\_.

1.  $p$  OR  $q$
2.  $p$  NOT  $q$
3.  $p$  AND  $q$
4.  $p$  XOR  $q$

**7. Which relations below are functions?**

$$R1 = \{(3,4), (4,5), (6,7), (8,9)\}$$

$$R2 = \{(3,4), (4,5), (6,7), (3,9)\}$$

$$R3 = \{(-3,4), (4,-5), (0,0), (8,9)\}$$

$$R4 = \{(8,11), (34,5), (6,17), (8,19)\}$$

1.  $R1$  and  $R3$  are functions
2.  $R1$  and  $R2$  are functions
3.  $R2$  and  $R4$  are functions
4.  $R3$  and  $R2$  are functions

**8. A student can choose a computer project from one of the two lists. The two lists contain 12 and 18 possible projects, respectively. How many possible projects are there to choose from?**

1. 12
2. 18
3. 30
4. 216

**9. If  $r$  is a positive real number, then the value of  $r$  in  $3.r.r = -27r$  is \_\_\_\_\_.**

1.  $-9$
2.  $+9$
3.  $0$
4. None of the given

**10. Find the number of the word that can be formed of the letters of the word "ELEVEN".**

1. 120
2. 110
3. 220

4. None of the given

**11. For the following relation to be a function, x can not be what values?**

$$R = \{(2,4), (x,1), (4,2), (5,6)\}$$

1. x cannot be 2, 4 or 5

2. x cannot be 4, 1 or 6

3. x cannot be 2, 4 or 6

4. x cannot be 1, 2 or 6

**12. An integer n is a perfect square if and only if \_\_\_\_\_ for some integer k.**

1.  $n = 2k$

2.  $n = k^2$

3.  $n = \text{square-root of } k$

4.  $n = k^3$

**13. Which of the following statements is true according to the Division Algorithm?**

1.  $17 = 5 \times 1 + 12$

2.  $17 = 5 \times 3 + 2$

3.  $17 = 5 \times 4 - 3$

4.  $17 = 5 \times 5 - 8$

**14. Let  $X = \{2, 4, 5\}$  and  $Y = \{1, 2, 4\}$  and R be a relation from X to Y defined by  $R = \{(2,4), (4,1), (a,2)\}$ . For what value of 'a' the relation R is a function ?**

1. 1

2. 2

3. 4

4. 5

**15. 'p is equivalent to q' means \_\_\_\_\_.**

1. p is not necessary but p is sufficient for q.

2. p is neither necessary nor sufficient for q.

3. p is necessary and sufficient for q.

4.  $p$  is necessary but not sufficient for  $q$ .

**16. Which of the followings is the product set  $A * B * C$  ? where  $A = \{a\}$ ,  $B = \{b\}$ , and  $C = \{c, d\}$ .**

1.  $\{(a, b, c), (a, b, d)\}$

2.  $\{(a, c, b), (a, d, b)\}$

3.  $\{(b, c, a), (b, d, a)\}$

4.  $\{(c, b, a), (d, b, a)\}$

**17. In how many ways a student can choose one of each of the courses when he is offered 3 mathematics courses, 4 literature courses and 2 history courses.**

1. 9

2. 24

3. 288

4. 14

**18. Let  $X = \{1, 2, 3\}$ , then 2-combinations of the 3 elements of the set  $X$  are \_\_\_\_\_?**

1.  $\{1, 2\}$ ,  $\{1, 3\}$  and  $\{2, 3\}$

2.  $\{1, 2\}$ ,  $\{2, 1\}$ ,  $\{1, 3\}$ ,  $\{3, 1\}$ ,  $\{2, 3\}$ , and  $\{3, 2\}$

3.  $\{1, 2\}$ ,  $\{2, 1\}$ ,  $\{1, 3\}$  and  $\{2, 3\}$

4.  $\{1, 2\}$ ,  $\{2, 1\}$ ,  $\{1, 3\}$  and  $\{3, 1\}$

**19. Determine values of  $x$  and  $y$ , where  $(2x, x + y) = (8, 6)$ .**

1.  $x = 3$  and  $y = 5$

2.  $x = 4$  and  $y = 2$

3.  $x = 6$  and  $y = 12$

4.  $x = 4$  and  $y = 12$

**20. A Random variable is also called a \_\_\_\_\_.**

1. Chance Variable

2. Constant

**21. Let  $f(x) = 3x$  and  $g(x) = x + 2$  define functions  $f$  and  $g$  from  $\mathbb{R}$  to  $\mathbb{R}$ , then  $(f \cdot g)(x)$  is \_\_\_\_\_.**

1.  $2x - 2$
2.  $3x + 2$
3.  $4x + 2$
4.  $3x^2 + 6x$

22. If  $X$  and  $Y$  are independent random variables, then  $E(XY)$  is equal to

1.  $E(XY)$
2.  $XE(Y)$
3.  $YE(X)$
4.  $E(x)E(y)$

23. The method of loop invariants is used to prove \_\_\_\_\_ of a loop with respect to certain pre and post-conditions.

1. falseness
2. correctness

24. What is the minimum number of students in a class to be sure that two of them are born in the same month?

1. 11
2. 12
3. 13
4. 14

25.  $P(0, 0) = \underline{\hspace{2cm}}?$

1. 0
2. 1
3. 2
4. undefined

26.  $(-2)! = \underline{\hspace{2cm}}?$

1. -2
2. 0
3. 2

4. Undefined

27. If  $p$  is false and  $q$  is true, then  $\sim p \leftrightarrow q$  is \_\_\_\_\_.

1. True

2. False

28. Let  $p \rightarrow q$  be a conditional statement, then the statement  $q \rightarrow p$  is called \_\_\_\_\_.

1. Inverse

2. Converse

3. Contrapositive

4. Double conditional

29. There are three bus lines between A and B, and two bus lines between B and C. Find the number of ways a person can travel round trip by bus from A to C by way of B?

1. 5

2. 6

3. 10

4. 36

30. The total number of terms in an arithmetic series  $0 + 5 + 10 + 15 + \dots + 50$  are \_\_\_\_\_.

1. 9

2. 10

3. 11

4. infinite

31. The set of prime numbers is \_\_\_\_\_.

1. finite set

2. infinite set

3. continuous set

4. None of the given

32. If  $A =$  Set of students of virtual university then  $A$  has been written in the \_\_\_\_\_.

1. Tabular form
2. Set builder form
3. Descriptive form
4. A is not a set

**33. If A and B are disjoint finite sets then  $n(A \cup B) =$  \_\_\_\_\_.**

1.  $n(A) - n(B)$
2.  $n(A) + n(B) - n(A \cap B)$
3.  $n(A) + n(B)$
4.  $n(A) + n(B) + n(A \cap B)$

**34. 'Reductio and absurdum' is another name of \_\_\_\_\_.**

1. Direct Method of proof
2. proof by contradiction
3. proof by contrapositive
4. None of the given

**35. The disjunction  $p \vee q$  is False when \_\_\_\_\_.**

1. p is False, q is True.
2. p is True, q is False.
3. p is True, q is True.
4. p is False, q is False.

**36.  $\sim(P \rightarrow q)$  is logically equivalent to \_\_\_\_\_.**

1.  $p \wedge \sim q$
2.  $p \vee \sim q$
3.  $\sim p \wedge q$
4.  $\sim p \vee q$

**37. Let A and B be subsets of U with  $n(A) = 12$ ,  $n(B) = 15$ ,  $n(A') = 17$ , and  $n(A \text{ intersection } B) = 8$ , then  $n(U) =$  \_\_\_\_\_ .**

1. 27
2. 29

3. 20

4. 35

**38. If  $X$  and  $Y$  are random variables, then  $E(aX)$  is equal to**

1.  $E(aX)$

2.  $aE(X)$

3.  $aX$

4. None of the given

**39. The negation of "Today is Friday" is**

1. Today is Saturday

2. Today is not Friday

3. Today is Thursday

4. None of the given

**40. Among 20 people, 15 either swim or jog or both. If 5 swim and 6 swim and jog, how many jog?**

1. 6

2. 16

3. 24

4. 46

**41. The functions  $f \circ g$  and  $g \circ f$  are always equal.**

1. TRUE

2. FALSE

**42. Let  $p$  be True and  $q$  be True, then  $(\sim p \wedge q)$  is \_\_\_\_\_.**

1.  $t$  ( where  $t$  is tautology. )

2.  $c$  ( where  $c$  is contradiction. )

3. True

4. False

**43. Let  $g$  be a function defined by  $g(x) = x + 1$ . Then the composition of  $(g \circ g)(x)$  is \_\_\_\_\_.**



1.  $x$
2.  $x + 1$
3.  $x + 2$
4.  $x^2 + 2x + 1$

44. The converse of the conditional statement 'If I live in Quetta, then I live in Pakistan' is \_\_\_\_\_.

1. If I live in Pakistan, then I live in Quetta.
2. If I live in Pakistan, then I do Not live in Quetta.
3. If I do Not live in Quetta, then I do Not live in Pakistan
4. If I do Not live in Quetta, then I live in Pakistan

45. Let  $A = \{2, 3, 5, 7\}$ ,  $B = \{2, 3, 5, 7, 2\}$ ,  $C =$  Set of first five prime numbers. Then from the following which statement is true ?

1.  $A = B$
2.  $A = C$
3.  $B = C$
4. All the three sets are equal.

46. If  $A$  and  $B$  be events with  $P(A) = 1/3$ ,  $P(B) = 1/4$  and  $P(A \cap B) = 1/6$ , then  $P(A \cup B) =$  \_\_\_\_\_ .

1.  $2/3$
2.  $5/12$
3.  $1/24$
4.  $1/2$

47. A student is to answer five out of nine questions on exams. Find the number of ways that can choose the five questions.

1. 216
2. 316
3. 126
4. None of the given

48. If  $X$  and  $Y$  are independent random variables and  $a$  and  $b$  are constants, then  $\text{Var}(aX + bY)$  is equal to

1.  $a\text{Var}(X) + b\text{Var}(Y)$
2.  $(a + b)[\text{Var}(X) + \text{Var}(Y)]$
3.  $\text{Var}(aX) + \text{Var}(bY)$
4.  $a^2 \text{Var}(X) + b^2 \text{Var}(Y)$

**49. Let R be the universal relation on a set A then which one of the following statement about R is true?**

1. R is not symmetric
2. R is not reflexive
3. R is not transitive
4. R is reflexive, symmetric and transitive.

**50. The conjunction  $p \wedge q$  is True when \_\_\_\_\_.**

1. p is True, q is False
2. p is False, q is True
3. p is True, q is True
4. p is False, q is False

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**51. Find the number of distinct permutations that can be formed using the letters of the word "BENZENE"**

1. 120
2. 220
3. 320
4. 420

**52. In how many ways a student can choose a course from 2 science courses, 3 literature courses and 5 art courses.**

1. 30
2. 10
3. 1440
4. 240

**53. A tree is normally constructed from \_\_\_\_\_.**

1. right
2. center

3. left to right

4. right to left

54. A non-zero integer  $d$  divides an integer  $n$  if and only if there exists an integer  $k$  such that \_\_\_\_\_.

1.  $n = d / k$

2.  $n = d k$

3.  $n = d + k$

4.  $n = d - k$

55. If  $A$  and  $B$  are any two sets, then  $A - B = B - A$

1. True

2. False

56. Let  $f(x) = x^2 + 1$  define functions  $f$  from  $R$  to  $R$  and  $c = 2$  be any scalar, then  $c.f(x)$  is \_\_\_\_\_.

1. 2

2.  $x^2 + 1$

3.  $2x^2 - 1$

4.  $2x^2 + 2$

57. Let  $R$  be a relation on a set  $A$ . If  $R$  is symmetric then its complement is \_\_\_\_\_.

1. Reflexive

2. Irreflexive

3. Symmetric

4. Antisymmetric

58.  $R = \{(a,1), (b,2), (c,3), (d,4)\}$  then the inverse of this relation is \_\_\_\_\_.

1.  $\{(a,1), (b,2), (3,c), (4,d)\}$

2.  $\{(1,a), (2,b), (3,c), (4,d)\}$

3.  $\{(a,1), (2,b), (3,c), (4,d)\}$

4.  $\{(1,a), (b,2), (3,c), (4,d)\}$

59. Let  $f(x) = 3x$  and  $g(x) = 3x - 2$  define functions  $f$  and  $g$  from  $R$  to  $R$ . Then  $(f+g)(x) =$  \_\_\_\_\_.

1.  $-2$
2.  $6x + 2$
3.  $6x - 2$
4.  $6x \cdot x - 2$

60. The set  $Z$  of all integers is \_\_\_\_\_.

1. uncountable
2. countable

61. If  $p \leftrightarrow q$  is True, then \_\_\_\_\_.

1. Only  $p$  is True.
2. Only  $q$  is True.
3.  $p$  and  $q$  both are True.
4. None of the given.

62. Let  $A = \{1, 2, 3\}$  and  $B = \{2, 4\}$  then number of functions from  $A$  to  $B$  are \_\_\_\_\_.

1. 6
2. 8
3. 16
4. 64

63. The switches in parallel act just like \_\_\_\_\_.

1. NOT gate
2. AND gate
3. OR gate
4. XOR gate

64. One-to-One correspondence means the condition of \_\_\_\_\_.

1. one-One
2. identity
3. onto
4. one-One and onto

65. There are 5 girls students and 20 boys students in a class. How many students are there in total ?

1. 4
2. 15
3. 25
4. 100

**66. Real valued function is a function that assigns \_\_\_\_\_ to each member of its domain.**

1. negative real number
2. positive real number
3. only a real number
4. any arbitrary real number

**67. A predicate becomes \_\_\_\_\_ when its variables are given specific values.**

1. sentence
2. statement
3. algorithm
4. iteration

**68. Let  $p_1, p_2, p_3$  be True premises in a given Truth Table. If the conjunctions of the Conclusion with each of  $p_1, p_2, p_3$  are True, then the argument is \_\_\_\_\_.**

1. False
2. True
3. Invalid
4. Valid

**69. In how many ways can 6 people be seated on 6 available seats?**

1. 120
2. 6
3. 12
4. 720

**70.  $x$  belongs to A or  $x$  belongs to B, therefore  $x$  belongs to \_\_\_\_\_.**

1. A intersection B
2. A union B
3. A difference B
4. A symmetric difference B

**71. The converse of the conditional statement  $p \rightarrow q$  is**

1.  $q \rightarrow p$
2.  $\sim q \rightarrow \sim p$
3.  $\sim p \rightarrow \sim q$
4. None of the given

**72. Which of the followings is the product set  $A * B * C$  ? where  $A = \{a\}$ ,  $B = \{b\}$ , and  $C = \{c, d\}$ .**

1.  $\{(a, b, c), (a, b, d)\}$
2.  $\{(a, c, b), (a, d, b)\}$
3.  $\{(b, c, a), (b, d, a)\}$
4.  $\{(c, b, a), (d, b, a)\}$

**73. Range of the relation  $\{(0,1), (3,22), (90,34)\}$  is \_\_\_\_\_ .**

1.  $\{0, 3, 90\}$
2.  $\{1, 22, 34\}$
3.  $\{0, 1, 3\}$
4.  $\{0, 1, 3, 22, 90, 34\}$

**74. How many possible outcomes are there when a fair coin is tossed four times?**

1. 4
2. 8
3. 16
4. 32

**75. The contrapositive of the conditional statement 'If it is Sunday, then I go for shopping' is \_\_\_\_\_.**

1. I do Not go for shopping, then it is Not Sunday.
2. I go for shopping, then it is Sunday.

3. I do Not go for shopping, then it is Sunday.
4. I go for shopping, then it is Not Sunday.

**76. A set is called finite, if and only if, it is the \_\_\_\_\_ or there is \_\_\_\_\_ .**

1. empty set, onto
2. empty set, one-to-one
3. one-to-one, onto
4. empty set, bijective

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**77. If p is false and q is false, then  $\sim p$  implies q is \_\_\_\_\_.**

1. True
2. False

**78. Let  $A = \{1, 2, 3, 4\}$  and  $B = \{7\}$  then the constant function from A to B is \_\_\_\_\_ .**

1. Onto
2. One to one
3. Both one to one and onto
4. Neither one to one nor onto

**79. If f and g are two one-to-one functions, then their composition that is gof is one-to-one.**

1. TRUE
2. FALSE

**80. If p = It is raining, q = She will go to college "It is raining and she will not go to college" will be denoted by**

1.  $p \wedge \sim q$
2.  $p \wedge q$
3.  $\sim(p \wedge q)$
4.  $\sim p \wedge q$

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**81. If a function  $(g \circ f)(x):X \rightarrow Z$  is defined as  $(g \circ f)(x) = g(f(x))$  for all  $x \in X$ . Then the function \_\_\_\_\_ is known as composition of  $f$  and  $g$ .**

1.  $(f \circ g)$
2.  $f^{-1}(g(x))$
3.  $(g \circ f)$
4.  $g^{-1}(f(x))$

**82. A box contains 5 different colored light bulbs. Which of the followings is the number of ordered samples of size 3 with replacement?**

1. 8
2. 15
3. 125
4. 243

**83. The disjunction of  $p$  and  $q$  is written as \_\_\_\_\_.**

1.  $p \vee q$
2.  $p \wedge q$
3.  $p \text{ XOR } q$
4. None of the given

**84. The functions ' $f$ ' and ' $g$ ' are inverse of each other if and only if their composition gives \_\_\_\_\_.**

1. constant function
2. identity function
3. bijective function
4. injective function

**85. What is the truth value of the sentence? 'It rains if and only if there are clouds.'**

1. True
2. False

**86. Let  $R$  be a relation on a set  $A$ . If  $R$  is reflexive then its compliment is \_\_\_\_\_ .**



1. Reflexive
2. Irreflexive
3. Symmetric
4. Antisymmetric

**87. Let R be a relation on a set A. If R is reflexive then its compliment is \_\_\_\_\_.**

1. Reflexive
2. Irreflexive
3. Symmetric
4. Antisymmetric

**88. Which of the followings is the factorial form of  $5^4$  .**

1.  $5/3$
2.  $5!/3$
3.  $5!/3!$
4.  $5/3!$

(prepared by izhar ullah khan whatasapp (923401933460))