PART - I

14 X 1 = 14

Answer all the questions. (Choose the correct answer from the give four alternatives and write with the option code)

1. A = {a, b, p}, B = {2, 3}, C = {p, q, r, s} then n ((A ∪ C) X B] is
   1) 8 ·2) 20 3) 12 4) 16

2. Let $f(x) = \sqrt{1 + x^2}$ then
   1) $f(xy) = f(x) \cdot f(y)$ 2) $f(xy) \geq f(x) \cdot f(y)$
   3) $f(xy) \leq f(x) \cdot f(y)$ 4) None of these

3. The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is
   1) 2025 2) 5220 3) 5025 4) 2520

4. Condition for a, b, c to be in A.P. is
   1) $C = \left(\dfrac{a+b}{2}\right)$ 2) $a = \left(\dfrac{b+c}{2}\right)$ 3) $b = a + c$ 4) $b = \left(\dfrac{a+c}{2}\right)$

5. If (x - 6) is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is
   1) 3 2) 5 3) 6 4) 8

6. The values of a and b if $4x^4 - 24x^3 + 76x^2 + ax + b$ is a perfect square are
   1) 100, 120 2) 10, 12 3) −120, 100 4) 12, 10

7. Transpose of a column matrix is
   1) unit matrix 2) diagonal matrix 3) column matrix 4) row matrix

8. If p, q are two consecutive odd numbers and p + q, pq, x are Pythagorean triple then the value of x is
   1) pq + 2 2) $p^2 + q^2$ 3) $(p + q)^2$ 4) 2 pq

9. If (5, 7), (3, p) and (6, 6) are collinear, then the value of p is
   1) 3 2) 6 3) 9 4) 12

10. if slope of the line PQ is $\dfrac{1}{\sqrt{3}}$ then slope of the perpendicular bisector of PQ is
    1) $\sqrt{3}$ 2) $-\sqrt{3}$ 3) $\dfrac{1}{\sqrt{3}}$ 4) 0

11. If $\cot^2 45° - \sin^2 60° = x \cdot \sin 30° \cdot \cos 30°$ then the value of x is
    1) 1 2) $\sqrt{3}$ 3) $\dfrac{1}{\sqrt{3}}$ 4) 2

12. If the radius of the base of a cone is tripled and the height is doubled then the volume is
    1) made 6 times 2) made 18 times 3) made 12 times 4) unchanged

13. The mean of 11 observation is $\overline{x}$, if first term is increased by 1 second term is increased by 2 and so on. What will be the new mean?

1) $\overline{x} + 66$ 2) $\overline{x} + 11$ 3) $\overline{x}$ 4) $\overline{x} + 6$

14. The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$ then the value of x is

1) 2   2) 1   3) 3   4) 1.5

PART- II

Answer 10 questions. (Question No. 28 is compulsory)   10 X 2 = 20

15. Let f be a function f : N —> N defined by f (x) = 3x + 2, $x \in N$. Find the images of 1, 2, 3.

16. Find the rational form of the number $0.\overline{123}$.

17. Solve : $\frac{x}{x-1} + \frac{x-1}{x} = 2\frac{1}{2}$.

18. If $A = \begin{pmatrix} 0 & 4 & 9 \\ 8 & 3 & 7 \end{pmatrix}$, $B = \begin{pmatrix} 7 & 3 & 8 \\ 1 & 4 & 9 \end{pmatrix}$ then find the matrix 3A – 9B.

19. If $A = \frac{x+1}{x-1}$, $B = \frac{x-1}{x+1}$ then find $\frac{A+B}{A-B}$.

20. The perimeters of two similar triangles ABC and PQR are respectively 36cm and 24cm. If PQ = 10cm, find AB.

21. You ar downloading a song. The percent y (in decimal form) of mega bytes remaining to get downloaded in x seconds is given by y = – 0.1 x + 1 after how many seconds the song will be downloaded completely?

22. The horizontal distance between two buildings is 70m. The angle of depression of the top of the first building when seen from the top of the second building is 45°. If the height of the second building is 120m, find the height of the first building.

23. Prove that $\frac{1}{\cosec \theta - \sin \theta} = \tan \theta . \sec \theta$.

24. The slant height of a frustum of a cone is 5cm and the radii of its ends are 4cm and1cm. Find its curved surface area.

25. A solid sphere and a solid hemisphere have equal total surface area. Prove that the ratio of their volume is $3\sqrt{3}:4$.

26. A die is rolled and a coin is tossed simultaneously. Find the probability that the die shows an odd number and the coin shows head.

27. Find the standard deviation of first 21 natural numbers.

28. Find the mean of first 100 odd natural numbers.

PART - III

Answer 10 questions. (Question No. 42 is compulsory).   10 X 5 = 50

29. Let A = The set of all natural numbers lees than 8, B = the set of all prime numbers less than 8, C = The set of even prime number, verify that $(A\cap B)\ X\ C = (A\ X\ C)\cap(B\ X\ C)$.

30. If the function f : R —>R defined by $f(x) = \begin{cases} 2x+7, & x < -2 \\ x^2 - 2, & -2 \le x < 3; \\ 3x - 2, & x \ge 3 \end{cases}$ then

the value of (i) f (4) ii) f (–2) (iii) f (4) + 2f (1) (iv) $\dfrac{f(1) - 3f(4)}{f(-3)}$.

31. Find the sum of all natural number between 300 and 600 which are divisible by 7.

32. If $S_n = (x+y) + (x^2 + xy + y^2) + (x^3 + x^2y + xy^2 + y^3) + \ldots\ldots\ldots$ n terms then prove

that $(x-y)\ S_n = \left[\dfrac{x^2\left(x^n - 1\right)}{x-1} - \dfrac{y^2\left(y^n - 1\right)}{y-1}\right]$.

33. The hypotenuse of a right angled triangle is 25cm and its perimeter 56cm, Find the length of the smallest side.

34. If $A = \begin{pmatrix} 1 & 1 \\ -1 & 3 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 2 \\ -4 & 2 \end{pmatrix}$, $C = \begin{pmatrix} -7 & 6 \\ 3 & 2 \end{pmatrix}$ verify that A (B + C) = AB + AC.

35. Two vertical poles of heights 6m and 3m are the value of y.
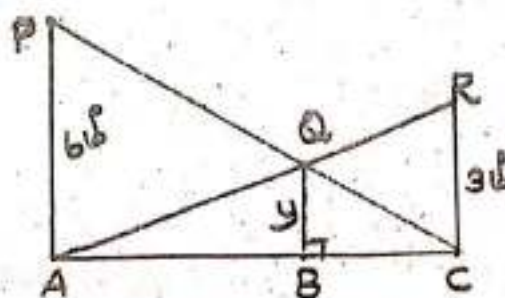
36. Find the area of the quadrilateral formed by the points (8, 6), (5, 11), (−5, 12) and (−4, 3).

37. Find the equation of a straight line through the intersection of lines $5x - 6y = 2$, $3x + 2y = 10$ and perpendicular to the line $4x - 7y + 13 = 0$.

38. If $A + B = 90°$ then prove that $\dfrac{\tan A \tan B + \tan A \cot B}{\sin A \sec B} - \dfrac{\sin^2}{\cos^2 A} = \cot^2 B$.

39. A right circular cylindrical container of base radius 6cm and height 15cm is full of ice cream. The ice cream is to be filled in cones of height 9cm and base radius 3cm, having a hemispherical cap. Find the number of cones needed to empty the container.

40. Find the coefficient of variation of 24, 26, 33, 37, 29, 31.

41. A person chooses a date at random in November for a party. Find the probability that he chooses.

    i) A Monday.

    ii) Wednesday

    iii) A Friday.

    iv) A Saturday (or) A Sunday.

November

Mon		4	11	18	25
Tue		5	12	19	26
W		6	13	20	27
Thu		7	14	21	28
F	1	8	15	22	29
Sat	2	9	16	23	30
Sun	3	10	17	24	

42. Find the quadratic equation whose roots

    are $\dfrac{p+q}{p}$ and $\dfrac{p+q}{q}$. Also find

    the nature of roots when $p = 2$ and $q = 3$.

PART - IV

Answer all the questions.   2 X 8 = 16

43. a) Draw a triangle ABC of base BC = 8cm, $\lfloor A = 60°$ and the bisector of $\lfloor A$ meets BC at D such that BD = 6cm. **(OR)**

    b) Draw a circle of radius 4.5cm. Take a point on the circle. Draw the tangent at that point using the alternative segment theorem.

44. a) Draw the graph of $y = 2x^2$ and hence solve $2x^2 - x - 6 = 0$. **(OR)**

    b) Draw the graph of $y = x^2 - 5x - 6$ and hence solve $x^2 - 5x - 14 = 0$.

1. If A and B are two non-empty sets, then the set of all ordered pairs (a, b) such that $a \in A, \ b \in B$ is called the, _____ and is denoted by _____ .

2. The "cartesian product" is also referred as " _____ ".

3. In general A×B ____ B×A, but n(A×B) ___ n(B×A).

4. When will A×B be equal to B×A? When _____.

5. $A \times B = \emptyset$ if and only if _____ .

6. If n(A) = p and n(B) =q then _____ .

7. For any two non-empty sets A and B, A×B is called as _____ .

8. If n(A×B) = 20 and n(A)= 5 then n(B) is ___.

9. If A = {−1,1} and B = {−1,1} then geometrically describe the set of points of $A \times B$.
   _____.

10. If A, B are the line segments given by the intervals (–4, 3) and (–2, 3) respectively, represent the cartesian product of A and B. _____.

11. If A, B, C are three non-empty sets then the cartesian product of three sets is the set of all possible _____ .

12. In general, cartesian product of two non-empty sets provides a shape in _____ and cartesian product of three non-empty sets provide an object in _____.

13. If n(A)=p, n(B)=q, then the total number of relations that exist between A and B is ___.

14. A relation which contains no element is called a " _____ ".

15. A function is also called as a _____ or _____ .

16. Relations are subsets of _____. Functions are subsets of _____.

17. True or False: All the elements of a relation should have images. _____ .

18. True or False: All the elements of a function should have images. _____ .

19. True or False: If R : A→ B is a relation then the domain of R = A. _____ .

20. If f : $\mathbb{N} \to \mathbb{N}$ is defined as $f \, x) = x^2$, the pre-image(s) of 1 and 2 are ____ and _____.

21. The difference between relation and function is _____ .

22. Let A and B be two non-empty finite sets. Then which one among the following two collection is large?

(i) The number of relations between A and B.

(ii) The number of functions between A and B.

23. The range of a function is a subset of its _____ .

24. Is the relation representing the association between planets and their respective moons a function? _____ .

25. In vertical line test if every vertical line intersects the curve in at most one point then the curve drawn in a graph represents a _____.

25. Any equation represented in a graph is usually called a ' _____ '.

26. A one-one function is also called an _____ .

27. An onto function is also called a _____ .

28. A one–one and onto function is also called a _____ or _____ .

29. Can there be a one to many function? _____ .

30. Is an identity function one – one function? _____ .

31. True or False: All one – one functions are onto functions. _____.

32. True or False: There will be no one – one function from A to B when n(A)= 4 , n(B)= 3 _____.

33. True or False: All onto functions are one – one functions. _____.

34. True or False: here will be no onto function from A to B when n(A)= 4 , n(B) = 5. _____.

35. True or False: If f is a bijection from A to B, then n(A) = n(B) . _____.

36. True or False: If n(A) = n(B) , then f is a bijection from A to B. _____.

37. True or False: All constant functions are bijections. _____.

38. If f(x) = x^m = and g(x) = x^n, does f o g = g o f ? <u>Yes / No</u>

39. The Composition g o f (x) exists only when range of f is a _____ of domain of g.

40. State your answer for the following questions by selecting the correct option.

   1. Composition of functions is commutative

    (a) Always true   (b) Never true   (c) Sometimes true

   2. Composition of functions is associative

    (a)Always true   (b) Never true   (c) Sometimes true

41. Is a constant function a linear function? <u>Yes / No</u>

42. Is quadratic function a one – one function? <u>Yes / No</u>

43. Is cubic function a one – one function? <u>Yes / No</u>

44. Is the reciprocal function a bijection? <u>Yes / No</u>

45. If $f : A \rightarrow B$ is a constant function, then the range of f will have ___ element.

46. If A and B are finite sets such that n(A) = p , n(B) = q then the total number of functions that exist between A and B is _____ .

10th Maths Chapter – 2 NUMBERS AND SEQUENCES

1. Euclid, one of the most important mathematicians wrote an important book named "Elements" in 13 volumes. The first six volumes were devoted to Geometry and for this reason, _____ is called the " _____ ".

2. The remainder is always _____ the divisor. If $r = 0$ then $a = bq$ so b divides a. Similarly, if b divides a then a = bq.

3. Euclid's Division Lemma can be generalised to any _____ .

4. When a positive integer is divided by 3

   1. What are the possible remainders? _____.

   2. In which form can it be written? _____ .

5. Find q and r for the following pairs of integers a and b satisfying a =bq +r .

   1). a = 13, b = 3   (q = ___ , r = ___ .)   2). a = 18, b = 4   (q = ___ , r = ___ .)

   3). a = 21, b = –4   (q = ___ , r = ___ .)   4). a = –32, b = –12   (q = ___ , r = ___ .)

   5). a = –31, b = 7   (q = ___ , r = ___ .)

6. Euclid's division algorithm is a repeated application of division lemma until we get remainder as _____ .

7. The HCF of two equal positive integers k, k is _____ .

8. Two positive integers are said to be relatively prime or co prime if their Highest Common Factor is _____ .

9. Is 1 a prime number? _____ .

10. Every natural number except ___ can be expressed as _____ .

11. In how many ways a composite number can be written as product of power of primes? _____ .

12. The number of divisors of any prime number is _____ .

13. Let m divides n. Then GCD and LCM of m, n are ____ and ____ .

14. The HCF of numbers of the form 2^m and 3^n is _____ .

15. Can you think of positive integers a, b such that $a^b = b^a$? _____ .

16. How many integers exist which leave a remainder of 2 when divided by 3? _____ .

17. Two integers a and b are congruent modulo n if a and b leave same remainder when divided by _____ .

18. The set of all positive integers whichleave remainder 5 when divided by 7 are

    _____ .

19. The positive values of k such that (k−3) -5 (mod11) are _____ .

20. If 59 ≡ 3 (mod 7), 46 ≡ 4 (mod 7) then 105 ≡ _ (mod 7), 13 ≡ _ (mod 7), 413 ≡ _(mod 7), 368 ≡ _ (mod 7).

21. The remainder when 7x13x19x23x29x31 is divided by 6 is _____ .

22. If the number of elements in a sequence is finite then it is called a _____ .

23. If the number of elements in a sequence is infinite then it is called an

_____ .

24. Fill in the blanks for the following sequences

   (i) 7, 13, 19, _____ , ...   (ii) 2, ___ , 10, 17, ___ ,…   (iii) 1000, 100, 10, 1, _____ , ...

25. A sequence is a function defined on the set of _____ .

26. The nth term of the sequence 0,2,6,12,20,... can be expressed as _____ .

26. Say True or False

  (i) All sequences are functions – _____ . (ii) All functions are sequences. – _____ .

27. Though all the Sequences are Functions, _____ all the functions are sequences.

28. The difference between any two consecutive terms of an A.P. is a _____ .

29. If a and d are the first term and common difference of an A.P. then the 8th term is

_____ .

30. If t_n is the n_{th} term of an A.P., then $t_{2n} - t_n$ is _____ .

31. The common difference of an A.P. can be _____ , _____ or _____ .

32. If t_n is the n_{th} term of an A.P. then the value of $t_{n+1} – t_{n-1}$ is _____ .

33. An Arithmetic progression having a common difference of zero is called a

_____ .

34. The common difference of a constant A.P. is _____ .

35. If a and l are first and last terms of an A.P. then the number of terms is

_____ .

36. If every term of an A.P. is multiplied by 3, then the common difference of the new

A.P. is _____ .

37. Three numbers a, b and c will be in A.P. if and only if _____ .

38. The sum of terms of a sequence is called _____ .

39. If a series have finite number of terms then it is called _____ .

40. A series whose terms are in Arithmetic progression is called _____ .

41. If the first and last terms of an A.P. are given, then the formula to find the sum is

_____ .

42. The value of n must be positive. Why? _____ .

43. State True or False. Justify it.

1). The nth term of any A.P. is of the form pn+q where p and q are some constants _____ .

2). The sum to nth term of any A.P. is of the form $pn_2+qn + r$ where p, q, r are some

    constants. _____ .

44. What is the sum of first n odd natural numbers? _____ .

45. What is the sum of first n even natural numbers. _____ .

46. A G.P. is obtained by multiplying _____ to the preceding term.

47. The ratio between any two consecutive terms of the G.P. is _____ and it is called _____ .

48. Fill in the blanks if the following are in G.P.

(i) $\frac{1}{8}$, $\frac{3}{4}$, $\frac{9}{2}$, _____   (ii) 7, $\frac{7}{2}$, _____   (iii) _____ , $2\sqrt{2}$, 4 , ...

49. If first term = a, common ratio = r, then find the value of $t_9 = $ _____ and $t_{27} = $ _____ .

50. In a G.P. if $t_1 = \frac{1}{5}$ and $t_2 = \frac{1}{25}$ then the common ratio is _____ .

51. Three non-zero numbers a, b, c are in G.P. if and only if _____ .

52. Split 64 into three part such that the numbers are G.P. _____ .

53. If a, b, c, … are in G.P. then 2a, 2b, 2c, … are also in _____ .

54. If 3, x, 6.75 are in G.P. then x is _____ .

55. The above formula for sum of first n terms of a G.P. is not applicable when r = ___ .

56. If r = 1 , then S_n = a + a + a + …. + a = _____ .

57. A series whose terms are in Geometric progression is called _____ .

58. When r = 1 , the formula for finding sum to n terms of a G.P. is _____ .

59. When r $\neq$ 1 , the formula for finding sum to n terms of a G.P. is _____ .

60. Sum to infinite number of termsof a G.P. is _____ .

61. For what values of r, does the formula for infinite G.P. valid? _____ .

62. Is the series 3 + 33 + 333 + ... a Geometric series? _____ .

63. The value of r, such that $1 + r + r^2 + r^3 \ldots = \frac{3}{4}$ is _____ .

64. How many squares are there in a standard chess board? _____ .

65. How many rectangles are there in a standard chess board? _____ .

66. The sum of cubes of first n natural numbers is the _____ of the first n natural numbers.

67. The average of first 100 natural numbers is _____ .

68. Say True or False. Justify them.

1. The sum of first n odd natural numbers is always an odd number. – _____ .

2. The sum of consecutive even numbers is always an even number. – _____ .

3. The difference between the sum of squares of first n natural numbers and the sum of first n natural numbers is always divisible by 2. – _____ .

4. The sum of cubes of the first n natural numbers is always a square number – _____ .

69. Is the sequence $2 , 2^2 , 2^{2^2} , 2^{2^{2^2}} , \ldots$ is a G.P. ? _____ .

10th Maths Chapter – 3 ALZEBRA.

1. Al-Khwarizmi is hailed as " _____ ".

2. The term "Algebra" has evolved as a misspelling of the word '_____'.

3. Linear equations are the _____ degree equations.

4. Quadratic equations are the _____ degree equations.

5. Cubic equations are the _____ degree equations.

6. xy – 7 = 3 is not a linear equation in two variables since the term xy is of degree ____ .

7. A linear equation with two variables represent a straight line in _____ plane.

8. The number of possible solutions when solving system of linear equations in three variables are _____.

9. If three planes are parallel then the number of possible point(s) of intersection is/are _____.

10. For a system of linear equations in three variables the minimum number of equations required to get unique solution is _____.

11. A system with _____ will reduce to identity.

12. A system with _____ will provide absurd equation.

13. Greatest Common Divisor of two given polynomials f(x) and g(x) is find out using _____.

14. If f(x) and g(x) are two polynomials of same degree then the polynomial carrying the _____ will be the dividend.

15. In case, if both have the same coefficient then compare the next _____. _____ and proceed with the division.

16. When two polynomials of same degree has to be divided, _____ should be considered to fix the dividend and divisor.

17. If r(x) = 0 when f(x) is divided by g(x) then g(x) is called _____ of the polynomials.

18. If $f(x) = g(x)\,q(x) + r(x)$, _____ must be added to $f(x)$ to make $f(x)$ completely divisible by $g(x)$.

19. If $f(x) = g(x)\,q(x) + r(x)$, _____ must be subtracted to $f(x)$ to make $f(x)$ completely divisible by $g(x)$.

20. Complete the factor tree for the given polynomials $f(x)$ and $g(x)$. Hence find their GCD and LCM. $f(x) = 2x^3 - 9x^2 - 32x - 21$; $g(x) = 2x^3 - 7x^2 - 43x - 42$
    $f(x) = 2x^3 - 9x^2 - 32x - 21 = (2x + 3)(\underline{\hspace{2cm}})(x + 1)$
    $g(x) = 2x^3 - 7x^2 - 43x - 42 = (\underline{\hspace{2cm}})(\underline{\hspace{2cm}})(x + 2)$
    GCD of $[f\,(x) and\, g\,(x)] = $ _____ ; LCM of $[f\,(x) and\, g\,(x)] = $ _____.

21. Is $f(x) \times g(x) \times r(x) = LCM\,[f\,(x), g(x), r(x)] \times GCD\,[f\,(x), g(x), r(x)]$? _____.

22. Are x^2 - 1 and $tanx = \frac{sinx}{cosx}$ rational expressions? _____.

23. The number of excluded values of $\frac{(x^3 + x^2 - 10x + 8)}{(x^4 + 8x^2 - 9)}$ is _____.

24. The sum of two rational expressions is always a rational expression. **True / False** .

25. The product of two rational expressions is always a rational expression. **True / False** .

26. Is $x^2 + 4x + 4$ a perfect square? _____.

27. What is the value of x in $3\sqrt{x} = 9$? _____.

28. The square root of $361x^4y^2$ is _____.

29. $\sqrt{(a^2x^2 + 2abx + b^2)}$ = _____.

30. If a polynomial is a perfect square then, its factors will be repeated _____ number of times (odd / even).

31. The _____ method in finding the square root of a polynomial is useful when the degree of the polynomial is higher.

32. To find the square root of a polynomial, the degrees of the variables are either in _____.

33. The values of x such that the expression $ax^2 + bx + c$ becomes zero are called _____ of the quadratic equation.

34. Fill up the empty box in each of the given expression so that the resulting quadratic polynomial becomes a perfect square.
$(i)\ x^2 + 14x +$ _____ $(ii)\ x^2 - 24x +$ _____ $(iii)\ p^2 + 2qp +$

.35. If the constant term of $ax^2+bx+c=0$ is zero, then the sum and product of roots are _____ and _____ .

36. If the graph of the given quadratic equation intersect the X axis at two distinct points, then the given equation has _____.

37. If the graph of the given quadratic equation touch the X axis at only one point, then the given equation has _____.

38. If the graph of the given equation does not intersect the X axis at any point then the given equation has no _____.

39. A matrix is a rectangular array of elements. The horizontal arrangements are called _____ and vertical arrangements are called _____.

40. When giving the order of a matrix, you should always mention the number of rows _____ , followed by the number of columns.

41. The number of column(s) in a column matrix is _____.

42. The number of row(s) in a row matrix is _____.

43. The non-diagonal elements in any unit matrix are _____.

44. Does there exist a square matrix with 32 elements? _____.

45. If A and B are any two non zero matrices, then $(A+B)^2$ **≠ / =** $A^2 + 2AB + B^2$.

46. However if AB = BA, then $(A+B)^2$ = _____ .

10th Maths Chapter – 4 GEOMETRY

1. **Are square and a rhombus similar or congruent. Discuss. _____.**

2. **Are a rectangle and a parallelogram similar. Discuss. _____.**

3. **Are any two right angled triangles similar? If so why?**

_____.   _____.

4. **A pair of equiangular triangles are _____.**

5. **If two triangles are similar, then they are _____.**

6. **If we change exactly _____ of the four given lengths, then we can make these triangles similar.**

7. **All circles are _____ (Congruent / Similar).**

8. **All squares are _____ (Similar / Congruent).**

9. **Two triangles are similar, if their corresponding angles are _____ and their corresponding sides are _____.**

10. **(a) All similar triangles are congruent – True/False. _____.**

     (b) All congruent triangles are similar – True/False. _____.

11. **Give two different examples of pair of non-similar figures.**

_____.

12. **A straight line drawn _____ to a side of a triangle divides the other two sides proportionally**

13. **Basic Proportionality Theorem is also known as _____.**

14. **Let △ABC be equilateral. If D is a point on BC and AD is the internal bisector of ∠A. Using Angle Bisector Theorem, BD/DE is _____.**

15. **The _____ of an angle of a triangle divides the opposite side internally in the ratio of the corresponding sides containing the angle.**

16. **If the median AD to the side BC of a △ABC is also an angle bisector of ∠A then AB/AC is _____.**

17. **In a right angled triangle, the side opposite to 90° (the right angle) is called the _____.**

18. **The other two sides are called _____ of the right angled triangle.**

19. **The _____ will be the longest side of the triangle.**

20. **In India, Pythagoras Theorem is also referred as "_____".**

21. **Write down any five Pythagorean triplets?**

_____ _____ _____ _____ _____.

22. In a right angle triangle the sum of other two angles is _____ .

23. Can all the three sides of a right angled triangle be odd numbers? _____.
Why?

24. _____ is the longest side of the right angled triangle.

25. The first theorem in mathematics is _____.

26. If the square of the longest side of a triangle is equal to sums of squares of other two sides, then the triangle is _____.

27. State True or False. Justify them.
   (i) Pythagoras Theorem is applicable to all triangles. _____.
   (ii) One side of a right angled triangle must always be a multiple of 4. _____.

28. A straight line cuts the circle is called as a _____.

29. The word "tangent" comes from the latin word "tangere" which means "_____".

30. The longest chord in a circle is the _____.

31. We can draw _____ tangents from a point outside the circle.

32. We can draw _____ tangent from a point on the circle.

33. A straight line that touches a circle at a common point is called a _____.

34. A chord is a sub-section of a _____.

35. The lengths of the two tangents drawn from _____ point to a circle are equal.

36. No tangent can be drawn from _____ .

37. _____ is a cevian that divides the angle, into two equal halves.

38. Can we draw two tangents parallel to each other on a circle? - _____.

39. Can we draw two tangents perpendicular to each other on a circle? - _____.

40. The term cevian comes from the name of Italian engineer _____.

41. A _____ is a line segment that extends from one vertex of a triangle to the opposite side.

42. A cevian that divides the opposite side into two congruent(equal) lengths is known as _____.

43. A cevian that is perpendicular to the opposite side is known as _____.

44. A cevian that bisects the corresponding angle is known as _____.

45. The cevians do not necessarily lie _____ the triangle, although they do in the diagram.

10th Maths Chapter – 5 COORDINATE GEOMETRY

1. Apollonius is hailed as "The Great Geometer". His greatest work was called "_____".

2. Coordinate geometry, also called _____ geometry.

3. The first degree equation in two variables ax +by +c = 0 represents a _____ in a plane.

The vertices of DPQR are P(0,-4) , Q(3,1) and R(-8,1)

4. Draw △PQR on a graph paper.

5. Check if △PQR is equilateral. _____.

6. Find the area of △PQR . _____.

7. Find the coordinates of M, the mid-point of QP. _____.

8. Find the coordinates of N, the mid-point of QR. _____.

9. Find the area of △MPN. _____.

10. What is the ratio between the areas of △MPN and △DPQR ? _____.

11. How many triangles exist, whose area is zero? _____.

12. If the area of a quadrilateral formed by the points (a, a), (–a, a), (a, –a) and (–a, –a), where a ≠ 0 is 64 square units, then identify the type of the quadrilateral. _____.

13. Find all possible values of a in the above question _____.

14. The inclination of X axis and every line parallel to X axis is _____.

15. The inclination of Y axis and every line parallel to Y axis is _____.

16. The measure of steepness is called _____ or _____.

17. The slope of a vertical line is _____.

18. Two non-vertical lines are parallel if and only if their slopes are _____.

19. When the line l_1 is parallel to l_2 if and only if their slopes are _____.

20. When the line l_1 is perpendicular to line l_2 then _____.

21. In any triangle, _____ angle is equal to sum of the opposite interior angles.

22. If the slopes of both the pairs of opposite sides are equal then the quadrilateral is a _____.

23. Provide three examples of using the concept of slope in real-life situations.

   1. _____.   2. _____.

   3. _____.

24. For, the point (x, y) in a xy plane, the x coordinate x is called "_____" and the y coordinate y is called "_____".

25. Is it possible to express, the equation of a straight line in slope-intercept form, when it is parallel to Y axis?   _____.

26. How many straight lines do you have with slope 1?   _____.

27. Find the number of point of intersection of two straight lines.

_____.

28. Find the number of straight lines perpendicular to the line 2x −3y + 6 = 0 .

_____.

10th Maths Chapter – 6 TRIGONOMETRY

1. _____ around 200 BC is considered as "The Father of Trigonometry"

2. When will the values of $sin\,\theta$ and $cos\,\theta$ be equal? _____.

3. For what values of $\theta,\ sin\,\theta$ = 2 ? _____.

4. Among the six trigonometric quantities, as the value of angle θ increase from 0° to 90°, which of the six trigonometric quantities has undefined values?

   _____   _____   _____   _____.

5. Is it possible to have eight trigonometric ratios? _____.

6. Let $0° \leq \theta \leq 90°$. For what values of θ does
   (i) $sin\,\theta > cos\,\theta$ (ii) $cos\,\theta > sin\,\theta$ (iii) $sec\,\theta = 2\,tan\,\theta$ (iv) $cosec\,\theta = 2\,cot\,\theta$
   (i) _____.   (ii) _____.   (iii) _____.   (iv) _____.

7. The number of trigonometric ratios is _____.

8. $1 - cos^2\theta$ is _____.

9. $(sec\,\theta + tan\,\theta)(sec\,\theta - tan\,\theta)$ is _____.

10. $(cot\,\theta + cosec\,\theta)(cot\,\theta - cosec\,\theta)$ is _____.

11. cos 60° sin 30° + cos 30° sin 60° is _____.

12. tan 60° cos 60° + cot 60° sin 60° is _____.

13. (tan 45°+ cot 45°)+(sec 45° cosec45°) is _____.

14. $(i)\ sec\,\theta = cosec\,\theta$ if θ is _____. $(ii)\ cot\,\theta = tan\,\theta$ if θ is _____.

15. What type of triangle is used to calculate heights and distances? _____.

16. When the height of the building and distances from the foot of the building is given, which trigonometric ratio is used to find the angle of elevation?

   _____.

17. If the line of sight and angle of elevation is given, then which trigonometric ratio is used
   (i) to find the height of the building. Height = _____.

   (ii) to find the distance from the foot of the building. Distance = _____.

18. What is the minimum number of measurements required to determine the height or distance or angle of elevation? _____.

19. The line drawn from the eye of an observer to the point of object is _____.

20. Which instrument is used in measuring the angle between an object and the eye of the observer? _____.

21. When the line of sight is above the horizontal level, the angle formed is

   _____.

22. The angle of elevation _____ as we move towards the foot of the vertical object (tower).

23. When the line of sight is below the horizontal level, the angle formed is _____.

24. Angle of Depression and Angle of Elevation are _____.

| Identity	Equal forms
$sin^2\theta + cos^2\theta$ =	(Or)
$1 + tan^2\theta$ =	(Or)
$1 + cot^2\theta$ =	(Or)

10th Maths Chapter – 7 **MENSURATION**

1. When 'h' coins each of radius 'r' units and thickness 1 unit is stacked one upon the other, what would be the solid object you get? _____.

   Also find its C.S.A. _____.

2. When the radius of a cylinder is double its height, find the relation between its C.S.A. and base area. _____.

3. Two circular cylinders are formed by rolling two rectangular aluminum sheets each of dimensions 12 m length and 5 m breadth, one by rolling along its length and the other along its width. Find the ratio of their curved surface areas. _____ .

4. Right circular cylinder is a solid obtained by revolving _____ about _____.

5. In a right circular cylinder the axis is _____ to the diameter.

6. The difference between the C.S.A. and T.S.A. of a right circular cylinder is _____.

7. The C.S.A. of a right circular cylinder of equal radius and height is _____ the area of its base.

8. Give practical example of solid cone. _____.

9. Find surface area of a cone in terms of its radius when height is equal to radius. _____.

10. Compare the above surface area with the area of the base of the cone. _____.

11. Right circular cone is a solid obtained by revolving _____ about one _____.

12. In a right circular cone the axis is _____ to the diameter.

13. The difference between the C.S.A. and T.S.A. of a cone is _____.

14. When a sector of a circle is transformed to form a cone, then match the conversions taking place between the sector and the cone.

Sector	Cone
Radius	Circumference of the base
Area	Slant height
Arc length	Curved surface area

15. Find the value of the radius of a sphere whose surface area is 36π sq. units. _____.

16. How many great circles can a sphere have? _____.

17. Find the surface area of the earth whose diameter is 12756 kms. _____.

18. Every section of a sphere by a plane is a _____.

19. The centre of a great circle is at the _____ of the sphere.

20. The difference between the T.S.A. and C.S.A. of hemisphere is _____.

21. The ratio of surface area of a sphere and C.S.A. of hemisphere is _____.

22. A section of the sphere by a plane through any of its great circle is _____.

23. Shall we get a hemisphere when a sphere is cut along the small circle? _____.

24. T.S.A of a hemisphere is equal to how many times the area of its base? _____.

25. How many hemispheres can be obtained from a given sphere? _____.

26. Give two real life examples for a frustum of a cone. _____.

27. Can a hemisphere be considered as a frustum of a sphere. _____.

28. The portion of a right circular cone intersected between two parallel planes is _____.

29. How many frustums can a right circular cone have? _____.

30. If the height is inversely proportional to the square of its radius, the volume of the cylinder is _____.

31. What happens to the volume of the cylinder with radius r and height h, when its
(a) radius is halved.   The volume is _____.
(b) height is halved.   The volume is _____.

32. Is it possible to find a right circular cone with equal
 (a) height and slant height ____ (b) radius and slant height ____ (c) height and radius.____.

33. There are two cones with equal volumes. What will be the ratio of their radius and height? _____.

34. A cone, a hemisphere and a cylinder have equal bases. The heights of the cone and cylinder are equal and are same as the common radius. Are they equal in volume? _____.

35. Give any two real life examples of sphere and hemisphere.
Sphere : _____.
Hemisphere : _____.

36. A plane along a great circle will split the sphere into _____ parts.

37. If the volume and surface area of a sphere are numerically equal, then the radius of the sphere is _____.

38. What is the ratio of volume to surface area of a sphere? _____.

39. The relationship between the height and radius of the hemisphere is _____.

40. The volume of a sphere is the product of its surface area and _____.

41. Is it possible to obtain the volume of the full cone when the volume of the frustum is known? _____.

42. Frustum of a cylinder : CSA = _____. ;   Volume = _____.

43. Volume of a cone is the product of its base area and _____.

44. If the radius of the cone is doubled, the new volume will be _____ times the original volume.

45. Consider the cones given in Fig.7.29
  (i) Without doing any calculation, find out whose volume is greater? _____.

  (ii) Verify whether the cone with greater volume has greater surface area. _____.

  (iii) Volume of cone A : Volume of cone B = ? _____.

cone A   cone B
4 cm   3 cm
3 cm   4 cm
Fig. 7.29
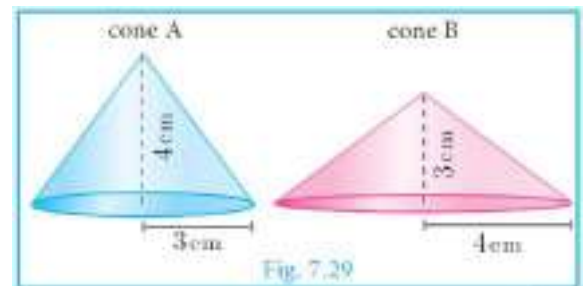
10th Maths Chapter 8 STATISTICS and PROBABILITY
Statistics

1. Prasanta Chandra Mahalanobis introduced innovative techniques for conducting large-scale sample surveys and calculated acreages and crop yields by using the _____ .

2. He was awarded the _____ , one of India's highest honours, by the Indian government in 1968 and he is hailed as " _____ ".

3. The Government of India has designated 29th June every year, coinciding with his birth anniversary, as " _____ ".

4. The most common Measures of Central Tendency are
   • _____   • _____   • _____.

5. Does the mean, median and mode are same for a given data? _____.
   _____.

6. What is the difference between the arithmetic mean and average? _____.

7. The mean of n observations is x , if first term is increased by 1 second term is increased by 2 and so on. What will be the new mean? _____.

8. The sum of all the observations divided by number of observations is _____.

9. If the sum of 10 data values is 265 then their mean is _____.

10. If the sum and mean of a data are 407 and 11 respectively, then the number of observations in the data are _____.

11. Measures of Variation (or) Dispersion of a data provide an idea of how observations _____ (or) _____ throughout the data.

12. Different Measures of Dispersion are 1._____. 2._____. 3._____.
    4._____. 5._____. 6. _____.

13. The range of first 10 prime numbers is _____ .

14. Can variance be negative? _____.

15. Karl Pearson was the first person to use the word _____. German mathematician Gauss used the word _____.

16. Can the standard deviation be more than the variance? _____.

17. If the variance is 0.49 then the standard deviation is _____.

18. For any collection of n values, can you find the value of
    (i). $\sum(x_i - \bar{x}) =$ _____.   (ii). $(\sum x_i) - \bar{x} =$ _____.

19. The standard deviation of a data is 2.8, if 5 is added to all the data values then the new standard deviation is _____.

20. If S is the standard deviation of values p, q, r then standard deviation of p–3, q–3, r–3 is _____.

21. Coefficient of variation is a relative measure of _____.

22. When the standard deviation is divided by the mean we get

_____.

23. The coefficient of variation depends upon _____. and _____.

24. If the mean and standard deviation of a data are 8 and 2 respectively then the coefficient of variation is _____.

25. When comparing two data, the data with _____ coefficient of variation is inconsistent.

Probability

1. An experiment in which a particular outcome cannot be predicted is called

_____.

2. The set of all possible outcomes is called a _____.

3. If an event E consists of only one outcome then it is called an _____.

4. Which of the following values cannot be a probability of an event?
$(a) - 0.0001$ $(b)\ 0.5$ $(c)\ 1.001$ $(d)\ 1$ $(e)\ 20\%$ $(f)\ 0.253$ $(g)\ \dfrac{1 - \sqrt{5}}{2}$ $(h)\ \dfrac{\sqrt{3} + 1}{4}$

_____.

5. What will be the probability that a non leap year will have 53 Saturdays? _____.

6. What is the complement event of an impossible event? _____.

7. 1. $P(only\ A) =$ _____.

8. $P(\bar{A} \cap B) =$ _____.

9. $A \cap B$ and $\bar{A} \cap B$ are _____ events.

10. $P(\bar{A} \cap \bar{B}) = P(\overline{A \cup B}) =$ _____.

11. If A and B are mutually exclusive events then $P(A \cap B) =$ _____.

12. If $P(A \cap B) = 0.3$, $P(\bar{A} \cap B) = 0.45$ then $P(B) =$ _____.

13. $P(A \cup B) + P(A \cap B)$ is _____.

14. $A \cap \bar{A} =$ _____.   ; $A \cup \bar{A} =$ _____.

15. If A, B are mutually exclusive events, then $P(A \cup B) =$ _____.

16. P (Union of mutually exclusive events) = _____.

10 th Standard Mathematics

Govt.Model Paper and PTA Questions One word Collections

1) If $n(A \times B) = 6$ and $A = \{1,3\}$ then $n(B)$ is

    (1) 1   (2) 2   (3) 3 ✓   (4) 6

$n(A \times B) = 6$ மற்றும் $A = \{1,3\}$ எனில் $n(B)$ ஆனது

    (1) 1   (2) 2   (3) 3   (4) 6

2) Given $F_1 = 1$, $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then F_5 is

    (1) 3   (2) 5   (3) 8   (4) 11 ✓

$F_1 = 1$, $F_2 = 3$ மற்றும் $F_n = F_{n-1} + F_{n-2}$ என கொடுக்கப்படின் F_5 ஆனது

    (1) 3   (2) 5   (3) 8   (4) 11

3) In an A.P, the first term is 1 and the common difference is 4. How many terms of the A.P must be taken for their sum to be equal to 120?

    (1) 6   (2) 7   (3) 8 ✓   (4) 9

ஒரு கூட்டுத் தொடர்வரிசையின் முதல் உறுப்பு 1 மற்றும் பொது வித்தியாசம் 4. இந்த கூட்டுத்தொடர் வரிசையில் எத்தனை உறுப்புகளின் கூடுதல் 120 ஆக இருக்கும்?

    (1) 6   (2) 7   (3) 8   (4) 9

4) $f = \{(2,a),(3,b),(4,b),(5,c)\}$ is a _____

    (1) identity function   (2) one-one function

    (3) many-one function ✓   (4) constant function

$f = \{(2,a),(3,b),(4,b),(5,c)\}$ ஒரு _____

    (1) சமனிச் சார்பு   (2) ஒன்றுக்கொன்றான சார்பு

    (3) பலவற்றிலிருந்து ஒன்றுக்கான சார்பு   (4) மாறிலி சார்பு

5) The number of points of intersection of quadratic polynomial $x^2 + 4x + 4$ with the x axis is

    (1) 0   (2) 1 ✓   (3) 0 (or) 1   (4) 2

$x^2 + 4x + 4$ என்ற இருபடி பல்லுறுப்புக் கோவை x அச்சோடு வெட்டும் புள்ளிகளின் எண்ணிக்கை

    (1) 0   (2) 1   (3) 0 (அல்லது) 1   (4) 2

6) The non- diagonal elements in any unit matrix are _____

    (1) 0 ✓   (2) 1   (3) m (4) n

எந்தவோர் அலகு அணியிலும் மூலைவிட்டத்திலில்லாத உறுப்புகள்

    (1) 0   (2) 1   (3) m (4) n

7) If A is a 2′ 3 matrix and B is a 3′ 4 matrix, how many columns does AB have?

    (1) 3   (2) 4 ✓   (3) 2   (4) 5

A என்ற அணியின் வரிசை 2ˊ 3, B என்ற அணியின் வரிசை 3ˊ 4 எனில், AB என்ற அணியின் நிரல்களின் எண்ணிக்கை யாது?

(1) 3   (2) 4   (3) 2   (4) 5

8) In figure CP and CQ are tangents to a circle with centre at O. ARB is another tangent touching the circle at R.
If $CP = 11$ cm and $BC = 7$ cm then the length of BR is

(1) 6 cm   (2) 5 cm
(3) (c) 8 cm   (4) 4 cm ✓
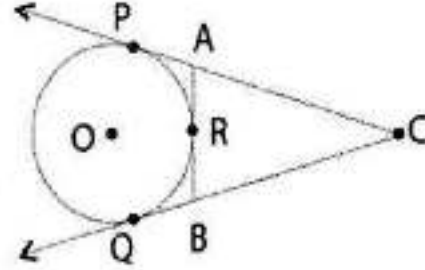
படத்தில் O வை மையமாக உடைய வட்டத்தின் தொடுகோடுகள் CP மற்றும் CQ ஆகும். ARB ஆனது வட்டத்தின் மீதுள்ள புள்ளி R வழியாக செல்லும் மற்றொரு தொடுகோடு ஆகும். CP = 11செமீ மற்றும் BC = 7செமீ எனில் BR –ன் நீளம்,

(1) 6 செமீ   (2) 5 செமீ   (3) 8 செமீ   (4) 4 செமீ

9) The slope of the line joining (12,3), (4,a) is $\frac{1}{8}$. The value of 'a' is _____

(1) 1   (2) 4   (3) −5   (4) 2 ✓

(12,3), (4,a) என்ற புள்ளிகளை இணைக்கும் கோட்டின் சாய்வு $\frac{1}{8}$ எனில், 'a' –ன் மதிப்பு _____

(1) 1   (2) 4   (3) −5   (4) 2

10) If $x = a\tan\theta$ and $y = b\sec\theta$ then

(1) $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$ ✓   (2) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ (3) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ (4) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 0$

$x = a\tan\theta$ மற்றும் $y = b\sec\theta$ எனில்

(1) $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$ (2) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ (3) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ (4) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 0$

11) A letter is chosen at random from the letter of the word "PROBABILITY". Find the probability that it is not a vowel.

(1) $\frac{1}{5}$ (2) $\frac{2}{3}$ ✓   (3) $\frac{1}{3}$ (4) $\frac{3}{5}$

"PROBABILITY" என்ற சொல்லின் எழுத்துகளிலிருந்து ஒரு எழுத்து தேர்ந்தெடுக்கப்படுகிறது அது உயிரெழுத்து இல்லாமலிருக்க நிகழ்தகவு

(1) $\frac{1}{5}$ (2) $\frac{2}{3}$ (3) $\frac{1}{3}$ (4) $\frac{3}{5}$

12) The height of a right circular cone whose radius is 5 *cm* and slant height is 13 *cm* will be

   (1) 12 *cm* ✓   (2) 10 *cm*   (3) 13 *cm*   (4) 5 *cm*

   ஆரம் 5 செ.மீ மற்றும் சாயுயரம் 13 செ.மீ உடைய நேர்வட்டக் கூம்பின் உயரம்

   (1) 12 செ.மீ.   (2) 10 செ.மீ   (3) 13 செ.மீ   (4) 5 செ.மீ

13) If the mean and co-efficient of variation of a data are 4 and 87.5% then the standard deviation is

   (1) 3.5 ✓   (2) 3   (3) 4.5   (4) 2.5

   ஒரு தரவின் சராசரி மற்றும் மாறுபாட்டுக் கெழு முறையே 4 மற்றும் 87.5% எனில் திட்டவிலக்கமானது.

   (1) 3.5   (2) 3   (3) 4.5   (4) 2.5

14) Variance of first 20 natural numbers is

   (1) 32.25   (2) 44.25   (3) 33.25 ✓   (4) 30

   முதல் 20 இயல் எண்களின் விலக்க வர்க்கச் சராசரியானது

   (1) 32.25   (2) 44.25   (3) 33.25   (4) 30

PTA Model Question 01

1. $\{(a,8),(6,b)\}$ ஆனது ஒரு சமனிச் சார்பு எனில், a மற்றும் b மதிப்புகளாவன முறையே

   (a) (8,6)   (b) (8,8)   (c) (6,8)   (d) (6,6)

   If $\{(a,8),(6,b)\}$ represents an identity function, then the value of a and b are respectively

   (a) (8,6) ✓   (b) (8,8)   (c) (6,8)   (d) (6,6)

2. $7^{44} \equiv$ _____ (மட்டு 100)

   (a) 1   (b) 2   (c) 3   (d) 4

   $7^{44} \equiv$ _____ (mod 100)

   (a) 1 ✓   (b) 2   (c) 3   (d) 4

3. மூன்று மாறிகளில் அமைத்த மூன்று நேரிய சமன்பாடுகளின் தொகுப்பிற்கு தீர்வுகள் இல்லையெனில், அத்தொகுப்பில் உள்ள தளங்கள்

   (a) ஒரே ஒரு புள்ளியில் வெட்டும்   (b) ஒரு கோட்டில் வெட்டும்.

   (c) ஒன்றின் மீது ஒன்று பொருந்தும்   (d) ஒன்றையொன்று வெட்டாது

   A system of three linear equations in three variables is inconsistent if their planes

   (a) intersect only at a point   (b) intersect in a line

   (c) coincides with each other   (d) do not intersect ✓

4. கொடுக்கப்பட்ட படத்தில் $\angle BAC = 90°$ மற்றும் $AD \perp BC$ எனில்

   (a) $BD.CD = BC^2$ (b) $AB.AC = BC^2$

   (c) $BD.CD = AD^2$ (d) $AB.AC = AD^2$

   In the adjacent figure $\angle BAC = 90°$ and $AD \perp BC$

   $\angle BAC = 90°$ and $AD \perp BC$ then
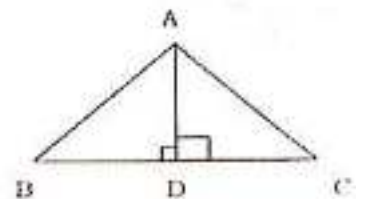
(a) $BD.CD = BC^2$ (b) $AB.AC = BC^2$

(c) $BD.CD = AD^2$ ✓   (d) $AB.AC = AD^2$

5. $x = 11$ எனக் கொடுக்கப்பட்ட நேர்கோட்டின் சமன்பாடானது

   (a) X அச்சுக்கு இணை   (b) Y - அச்சுக்கு இணை

   (c) ஆதிப்புள்ளி வழிச் செல்லும்   (d) $(0,11)$ என்ற புள்ளி வழிச் செல்லும்

The straight line given by the equation $x = 11$ is

(a) parallel to X axis   (b) parallel to Y axis ✓

(c) passing through the origin   (d) passing through the point (0,11)

6. $(\sin\alpha + \mathrm{cosec}\,\alpha)^2 + (\cos\alpha + \sec\alpha)^2 = k + \tan^2\alpha + \cot^2\alpha$ எனில் k-ன் மதிப்பு

   (a) 9   (b) 7   (c) 5   (d) 3

If $(\sin\alpha + \mathrm{cosec}\,\alpha)^2 + (\cos\alpha + \sec\alpha)^2 = k + \tan^2\alpha + \cot^2\alpha$ then the value of k is equal to

(a) 9   (b) 7 ✓   (c) 5   (d) 3

7. ஒர் உருளையின் ஆரம் அதன் உயரத்தில் மூன்றில் ஒரு பங்கு எனில் அதன் மொத்தப் புறப்பரப்பு

   (a) $\dfrac{9\pi h^2}{8}$ ச.அலகுகள்,   (b) $24\pi h^2$ ச.அலகுகள்

   (c) $\dfrac{8\pi h^2}{9}$ ச.அலகுகள்   (d) $\dfrac{56\pi h^2}{9}$ ச.அலகுகள்

The total surface area of a cylinder whose radius is $\dfrac{1}{3}$ of its height is

(a) $\dfrac{9\pi h^2}{8}$ sq. units   (b) $24\pi h^2$ sq. units

(c) $\dfrac{8\pi h^2}{9}$ sq.units ✓   (d) $\dfrac{56\pi h^2}{9}$ sq.units

8. கொடுக்கப்பட்ட வைகளில் எது தவறானது ?

   (a) $P(A) > 1$ (b) $0 \le P(A) \le 1$

   (c) $P(\phi) = 0$ (d) $P(A) + P(\overline{A}) = 1$

Which of the following is incorrect?

(a) $P(A) > 1$ ✓   (b) $0 \le P(A) \le 1$

(c) $P(\phi) = 0$ (d) $P(A) + P(\overline{A}) = 1$

9. $-3, -3, -3, \ldots\ldots$ என்பது எத்தகைய தொடர் வரிசை?

   (a) கூட்டுத்தொடர் வரிசை   (b) பெருக்குத் தொடர் வரிசை

   (c) மேற்கண்ட இரண்டும் அல்ல   (d) கூட்டுத்தொடர் மற்றும் பெருக்குத்தொடர்

The sequence $-3, -3, -3, \ldots\ldots$ is

(a) an A.P only   (b) a G.P only

(c) neither A.P nor G.P   (d) both A.P and G.P ✓

10. $x^3 - a^3$ மற்றும் $(x - a)^2$ இன் மீசிம

(a) $(x^3 - a^3)(x + a)$ (b) $(x^3 - a^3)(x - a)^2$

(c) $(x - a)^2(x^2 + ax + a^2)$ (d) $(x + a)^2(x^2 + ax + a^2)$

The LCM of $x^3 - a^3$ and $(x - a)^2$ is

(a) $(x^3 - a^3)(x + a)$ (b) $(x^3 - a^3)(x - a)^2$

(c) $(x - a)^2(x^2 + ax + a^2)$ ✓   (d) $(x + a)^2(x^2 + ax + a^2)$

11. $n(A) = p$, $n(B) = q$ எனில் A மற்றும் B க்கு இடையே கிடைக்கும் மொத்த உறவுகளின் எண்ணிக்கை

(a) 2^p (b) 2^q (c) 2^{p+q} (d) 2^{pq}

If $n(A) = p$, $n(B) = q$ then the total number of relations that exist between A and B is

(a) 2^p (b) 2^q (c) 2^{p+q} (d) 2^{pq} ✓

12. 65 மற்றும் 117 ஆகியவற்றின் மீபொவ-வை $65m - 117$ என்ற வடிவில் எழுதும் போது m-ன் மதிப்பு

(a) 4   (b) 2   (c) 1   (d) 3

If the HCF of 65 and 117 is expressible in the form of $65m - 117$, then the value of m is

(a) 4   (b) 2 ✓   (c) 1   (d) 3

13. சராசரியிலிருந்து கிடைக்கப்பெற்ற தரவுப்புள்ளிகளுடைய விலக்கங்களின் கூடுதலானது

(a) எப்பொழுதும் மிகை எண்   (b) எப்பொழுதும் குறை எண்

(c) பூச்சியம்   (d) பூச்சியமற்ற முழுக்கள்

The sum of all deviations of the data from its mean is

(a) always positive   (b) always negative   (c) zero ✓   (d) non-zero integer

14. ஏற்றக்கோணம் மற்றும் இறக்கக்கோணங்களை அளவிடும் கருவி

(a) தியோடலைட்   (b) கலைடாஸ்கோப்

(c) பெரிஸ்கோப்   (d) தொலைநோக்கி

The angle of elevation and depression are usually measured by a device called

(a) Theodolite ✓   (b) kaleidoscope   (c) Periscope   (d) Telescope

1. $f : A \rightarrow B$ என்பது ஒரு இருபுறச் சார்பு மற்றும் $n(B) = 7$ எனில், $n(A)$ ஆனது

   (a) 7   (b) 49   (c) 1   (d) 14

   If $f : A \rightarrow B$ is a bijective function and if $n(B) = 7$, then $n(A)$ is equal to

   (a) 7 ✓   (b) 49   (c) 1   (d) 14

2. $A = \{1, 2, 3, 4, 5\}$-லிருந்து B என்ற கணத்திற்கு 1024 உறவுகள் உள்ளது எனில் B-ல் உள்ள உறுப்புகளின் எண்ணிக்கை

   (a) 3   (b) 2 ✓   (c) 4   (d) 8

   If there are 1024 relations from a set $A = \{1, 2, 3, 4, 5\}$ to a set B, then the number of elements in B is

   (a) 3   (b) 2   (c) 4   (d) 8

3. $\dfrac{3}{16}, \dfrac{1}{8}, \dfrac{1}{12}, \dfrac{1}{18}, \cdots$ என்ற தொடர்வரிசையின் அடுத்த உறுப்பு

   (a) $\dfrac{1}{24}$ (b) $\dfrac{1}{27}$ (c) $\dfrac{2}{3}$ (d) $\dfrac{1}{81}$

   The next term of the sequence $\dfrac{3}{16}, \dfrac{1}{8}, \dfrac{1}{12}, \dfrac{1}{18}, \cdots$ is

   (a) $\dfrac{1}{24}$ (b) $\dfrac{1}{27}$ ✓   (c) $\dfrac{2}{3}$ (d) $\dfrac{1}{81}$

4. $x^4 + 64$-ஐ முழு வர்க்கமாக மாற்ற அதனுடன் எதனைக் கூட்ட வேண்டும்?

   (a) $4x^2$ (b) $16x^2$ (c) $8x^2$ (d) $-8x^2$

   Which of the following should be added to make $x^4 + 64$ a perfect square?

   (a) $4x^2$ (b) $16x^2$ ✓   (c) $8x^2$ (d) $-8x^2$

5. $\dfrac{x^3 + 8}{x^2 - 2x - 8}$ என்ற விகிதமுறு கோவையின் விலக்கப்பட்ட மதிப்பு

   (a) 8   (b) 2   (c) 4   (d) 1

   The excluded value of the rational expression $\dfrac{x^3 + 8}{x^2 - 2x - 8}$ is

   (a) 8   (b) 2   (c) 4 ✓   (d) 1

6. ஒரு நேரிய பல்லுறுப்புக் கோவையின் வரைபடம் ஒரு

   (a) நேர்கோடு   (b) வட்டம்   (c) பரவளையம்   (d) அதிபரவளையம்

   Graph of a linear polynomial is a

   (a) straight line ✓   (b) circle   (c) parabola   (d) hyperbola

7. ஒரு வட்டத்தின் ஆரமும் தொடுகோடும் செங்குத்தாக அமையும் இடம்

   (a) மையம் (b) தொடுபுள்ளி

   (c) முடிவிலி (d) நாண்

   A tangent is perpendicular to the radius at the

   (a) centre ✓(b) point of contact (c) infinity (d) chord

8. $(-5,0), (0,-5)$ மற்றும் $(5,0)$ ஆகிய புள்ளிகளால் அமைக்கப்படும் முக்கோணத்தின் பரப்பு

   (a) 0 ச.அலகுகள் (b) 25 ச.அலகுகள்

   (c) 5 ச.அலகுகள் (d) இவற்றில் எதுவுமில்லை

   The area of a triangle formed by the points $(-5,0), (0,-5)$ and $(5,0)$ is

   (a) 0 sq.units (b) 25 sq.units ✓ (c) 5 sq.units (d) none of these

9. $3x - y = 4$ மற்றும் $x + y = 8$ ஆகிய நேர்கோடுகள் சந்திக்கும் புள்ளி

   (a) $(5,3)$ (b) $(2,4)$ (c) $(3,5)$ (d) $(4,4)$

   The point of intersection of $3x - y = 4$ and $x + y = 8$ is

   (a) $(5,3)$ (b) $(2,4)$ (c) $(3,5)$ ✓ (d) $(4,4)$

10. $5x = \sec\theta$ மற்றும் $\dfrac{5}{x} = \tan\theta$ எனில், $x^2 - \dfrac{1}{x^2}$ -ன் மதிப்பு

    (a) 25 (b) $\dfrac{1}{25}$ (c) 5 (d) 1

    If $5x = \sec\theta$ and $\dfrac{5}{x} = \tan\theta$, then $x^2 - \dfrac{1}{x^2}$ is equal to

    (a) 25 (b) $\dfrac{1}{25}$ ✓ (c) 5 (d) 1

11. $\dfrac{\sin(90-\theta)\sin\theta}{\tan\theta} + \dfrac{\cos(90-\theta)\cos\theta}{\cot\theta} =$

    (a) $\tan\theta$ (b) 1 (c) -1 (d) $\sin\theta$

    $\dfrac{\sin(90-\theta)\sin\theta}{\tan\theta} + \dfrac{\cos(90-\theta)\cos\theta}{\cot\theta} =$

    (a) $\tan\theta$ (b) 1 ✓ (c) -1 (d) $\sin\theta$

12. இடைக்கண்டத்தை ஒரு பகுதியாகக் கொண்ட ஒரு கூம்பின் உயரம் மற்றும் ஆரம் முறையே h_1 அலகுகள் மற்றும் r_1 அலகுகள் ஆகும். இடைக்கண்டத்தின் உயரம் மற்றும் சிறிய பக்கத்தின் ஆரம் முறையே h_2 அலகுகள் மற்றும் r_2 அலகுகள் ஆகும். மேலும் $h_2 : h_1 = 1 : 2$ எனில், $r_2 : r_1$ -ன் மதிப்பு

    (a) 1:3 (b) 1:2 (c) 2:1 (d) 3:1

The height and radius of the cone of which the frustum is a part are h_1 units and r_1 units repectively. Height of the frustum is h_2 units and radius of the smaller base is r_2 units. If $h_2 : h_1 = 1 : 2$ then $r_2 : r_1$ is

(a) 1 : 3   (b) 1 : 2 ✓   (c) 2 : 1   (d) 3 : 1

13. முதல் பத்து பகா எண்களின் வீச்சு

(a) 9   (b) 20   (c) 27   (d) 5

The range of first 10 prime numbers is

(a) 9   (b) 20   (c) 27 ✓   (d) 5

14. முதல் 'n' இயல் எண்களின் சராசரி

(a) $\dfrac{n(n+1)}{2}$ (b) $\dfrac{n}{2}$ (c) $\dfrac{n+1}{2}$ (d) n

The average of first 'n' natural numbers is

(a) $\dfrac{n(n+1)}{2}$ (b) $\dfrac{n}{2}$ (c) $\dfrac{n+1}{2}$ ✓   (d) n

PTA Model Question 03

1. $A = \{a, b, p\}, B = \{2, 3\}, C = \{p, q, r, s\}$ எனில் $n[(A \cup C) \times B]$ ஆனது

(a) 8   (b) 20   (c) 12   (d) 16

$A = \{a, b, p\}, B = \{2, 3\}, C = \{p, q, r, s\}$ then $n[(A \cup C) \times B]$ is

(a) 8   (b) 20   (c) 12 ✓   (d) 16

2. $f(x) = (-1)^x$ என்பது $\mathbb{N}$ -லிருந்து $\mathbb{Z}$ க்கு வரையறுக்கப்பட்டுள்ளது. எனில் f -ன் வீச்சகம்

(a) $\{1\}$ (b) $\mathbb{N}$ (c) $\{1, -1\}$ (d) $\mathbb{Z}$

Given $f(x) = (-1)^x$ is a function from $\mathbb{N}$ to $\mathbb{Z}$. Then the range of f is

(a) $\{1\}$ (b) $\mathbb{N}$ (c) $\{1, -1\}$ ✓   (d) $\mathbb{Z}$

3. $(1^3 + 2^3 + 3^3 + \cdots + 15^3) - (1 + 2 + 3 + \cdots + 15)$ -ன் மதிப்பு

(a) 14400   (b) 14200   (c) 14280   (d) 14520

The value of $(1^3 + 2^3 + 3^3 + \cdots + 15^3) - (1 + 2 + 3 + \cdots + 15)$ is

(a) 14400   (b) 14200   (c) 14280 ✓   (d) 14520

4. $2 + 4 + 6 + \cdots + 2k = 90$, எனில் k -ன் மதிப்பு

(a) 8   (b) 9   (c) 10   (d) 11

If $2 + 4 + 6 + \cdots + 2k = 90$, then the value of k is

(a) 8   (b) 9 ✓   (c) 10   (d) 11

5. $8y = 4x + 21$ என்ற நேர்க்கோட்டின் சமன்பாட்டிற்குக் கீழ்கண்ட வற்றில் எது உண்மை?

   (a) சாய்வு 0.5 மற்றும் y – வெட்டுத்துண்டு 2.6
   (b) சாய்வு 5 மற்றும் y – வெட்டுத்துண்டு 1.6
   (c) சாய்வு 0.5 மற்றும் y – வெட்டுத்துண்டு 1.6
   (d) சாய்வு 5 மற்றும் y – வெட்டுத்துண்டு 2.6

   A straight line has equation $8y = 4x + 21$. Which of the following is true?

   (a) The slope is 0.5 and the y - intercept is 2.6 ✓
   (b) The slope is 5 and the y - intercept is 1.6
   (c) The slope is 0.5 and the y - intercept is 1.6
   (d) The slope is 5 and the y - intercept is 2.6

6. $6x^2y, 9x^2yz, 12x^2y^2z$ ஆகியவற்றின் மீ.பொ.வ

   (a) $36xy^2z^2$ (b) $36x^2y^2z$ (c) $36x^2y^2z^1$ (d) $3x^2y$

   GCD of $6x^2y, 9x^2yz, 12x^2y^2z$ is

   (a) $36xy^2z^2$ (b) $36x^2y^2z$ (c) $36x^2y^2z^2$ (d) $3x^2y$ ✓

7. $\triangle ABC$ -ல், $DE \parallel BC$, $AB = 3.6\,cm$, $AC = 2.4$ செமீ. மற்றும் $AD = 2.1$செமீ, எனில் AE -ன் நீளம்

   (a) 1.4செமீ   (b) 1.8செமீ   (c) 1.2செமீ   (d) 1.05செமீ

   In $\triangle ABC$, $DE \parallel BC$, $AB = 3.6\,cm$, $AC = 2.4\,cm$. $AD = 2.1\,cm$, then the length of AE is

   (a) $1.4\,cm$ ✓   (b) $1.8\,cm$ (c) $1.2\,cm$ (d) $1.05\,cm$

8. $(12,3), (4, a)$ என்ற புள்ளிகளை இணைக்கும் கோட்டின் சாய்வு $\dfrac{1}{8}$ எனில், a-ன் மதிப்பு

   (a) 1 (b) 4 (c) -5 (d) 2

   The slope of the line joining $(12,3), (4, a)$ is $\dfrac{1}{8}$, the value of a is

   (a) 1 (b) 4 (c) -5 (d) 2 ✓

9. $(2,1)$-ஐ வெட்டும் புள்ளியாகக் கொண்ட இரு நேர்க்கோடுகள்

   (a) $x - y - 3 = 0; 3x - y - 7 = 0$ (b) $x + y = 3; 3x + y = 7$
   (c) $3x + y = 3; x + y = 7$ (d) $x + 3y - 3 = 0; x - y - 7 = 0$

   $(2,1)$ is the point of intersection of two lines

   (a) $x - y - 3 = 0; 3x - y - 7 = 0$ (b) $x + y = 3; 3x + y = 7$ ✓
   (c) $3x + y = 3; x + y = 7$ (d) $x + 3y - 3 = 0; x - y - 7 = 0$

10. $\tan\theta \csc^2\theta - \tan\theta$ -ன் மதிப்பு

    (a) $\sec\theta$ (b) $\cot^2\theta$ (c) $\sin\theta$ (d) $\cot\theta$

    $\tan\theta \csc^2\theta - \tan\theta$ is equal to

    (a) $\sec\theta$ (b) $\cot^2\theta$ (c) $\sin\theta$ (d) $\cot\theta$ ✓

11. ஒரு அரைக்கோளத்தின் மொத்தப் பரப்பு அதன் ஆரத்தினுடைய வர்க்கத்தின் எத்தனை மடங்காகும்?

(a) π (b) 4π (c) 3π (d) 2π

The total surface area of a hemisphere is how much times the square of its radius?

(a) π (b) 4π (c) 3π ✓   (d) 2π

12. 36π செமீ³ கன அளவு கொண்ட ஒரு கோளத்தின் ஆரம்.

(a) 3செமீ   (b) 2செமீ   (c) 5செமீ   (d) 10செமீ

If the volume of sphere is 36πcm³, then its radius is equal to

(a) 3cm ✓   (b) 2cm   (c) 5cm   (d) 10cm

13. $8,8,8,8 \ldots 8$ ஆகிய தரவின் வீச்சு

(a) 0   (b) 1   (c) 8   (d) 3

The range of the data $8,8,8,8 \ldots 8$ is

(a) 0 ✓   (b) 1   (c) 8   (d) 3

14. ஆங்கில எழுத்துகளிலிருந்து ஓர் எழுத்து சமவாய்ப்பு முறையில் தேர்வு செய்யப்படுகிறது. அந்த எழுத்து x-க்கு முந்தைய எழுத்துகளில் ஒன்றாக இருப்பதற்கான நிகழ்தகவு

(a) $\dfrac{12}{13}$ (b) $\dfrac{1}{13}$ (c) $\dfrac{23}{26}$ (d) $\dfrac{3}{26}$

If a letter is chosen at random from the english alphabets, then the probability that the letter chosen precedes x

(a) $\dfrac{12}{13}$ (b) $\dfrac{1}{13}$ (c) $\dfrac{23}{26}$ ✓   (d) $\dfrac{3}{26}$

PTA Model Question 04

1. $R = \left\{ (x, x^2)/x \text{ ஆனது } 13ஐ \text{ விடக்குறைவான பகா எண்கள்} \right\}$ என்ற உறவின் வீச்சகமானது

(a) $\{2,3,5,7\}$ (b) $\{2,3,5,7,11\}$

(c) $\{4,9,25,49,121\}$ (d) $\{1,4,9,25,49,121\}$

The range of the relation $R = \left\{ (x, x^2)/x \text{ is a prime number lessthan } 13 \right\}$ is

(a) $\{2,3,5,7\}$ (b) $\{2,3,5,7,11\}$

(c) $\{4,9,25,49,121\}$ ✓   (d) $\{1,4,9,25,49,121\}$

2. $A = \{1,2,3,4\}$ மற்றும் $B = \{4,8,9,10\}$ எனக. $f : A \to B$ ஆனது சார்பு $f = \{(1,4),(2,8),(3,9),(4,10)\}$ எனக் கொடுக்கப்பட்டால்

(a) பலவற்றிலிருந்து ஒன்றுக்கான சார்பு   (b) சமனிச்சார்பு

(c) ஒன்றக்கொன்றான சார்பு   (d) உட்சார்பு

Let $A = \{1,2,3,4\}$ and $B = \{4,8,9,10\}$. A function $f : A \to B$ given by $f = \{(1,4),(2,8),(3,9),(4,10)\}$ is a an

(a) many –one function   (b) identity function

(c) one – one function ✓   (d) into function

3. ஒரு கூட்டுத்தொடர் வரிசையின் 6 வது உறுப்பின் 6 மடங்கும் 7 வது உறுப்பின் 7 மடங்கும் சமம் எனில். அக்கூட்டுத்தொடர் வரிசையின் 13 வது உறுப்பு

(a) 0   (b) 6   (c) 7   (d) 13

If 6 times of 6th term of an A.P is equal to 7 times the 7th term, then the 13th term of an A.P is

(a) 0 ✓   (b) 6   (c) 7   (d) 13

4. 1729 –ஐ பகாக் காரணிப்படுத்தும் போது. அந்த பகா எண்களின் அடுக்குகளின் கூடுதல்

(a) 1   (b) 2   (c) 3   (d) 4

The sum of the exponents of the prime factors in the prime factorization of 1729 is

(a) 1   (b) 2   (c) 3 ✓   (d) 4

5. a மற்றும் b என்பன இரு மிகை முழுக்கள். இங்கு $a > 0$. b என்பது a - ன் ஒரு காரணி எனில் a மற்றும் b ஆகியவற்றின் மீ.பொ.வ

(a) b (b) a (c) $3ab$ (d) $\dfrac{a}{b}$

If a and b are two positive integers where $a > 0$ and b is a factor of a, then HCF of a and b is

(a) b ✓   (b) a (c) $3ab$ (d) $\dfrac{a}{b}$

6. $x^2 - 2x - 24$ மற்றும் $x^2 - kx - 6$ ஆகியவற்றின் மீ.பொ.வ $(x-6)$ எனில், k –ன் மதிப்பு

(a) 3   (b) 5   (c) 6   (d) 8

If $(x-6)$ is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is

(a) 3   (b) 5 ✓   (c) 6   (d) 8

7. ஒரு பல்லுறுப்புக் கோவையானது முழுவர்க்கம் எனில் அதன் காரணிகள் _____ எண்ணிக்கையில் இடம் பெறும்

(a) ஒற்றைப்படை   (b) பூச்சியம்

If a polynomial is a perfect square then its factors will be repeated _____ number of times

(a) odd   (b) zero   (c) even ✓   (d) none of the above

(c) இரட்டைப்படை   (d) மேற்கூறியவற்றில் எதுவும் இல்லை

8. இரு சமபக்க முக்கோணம் ABC -ல் $\angle C = 90$ மற்றும் $AC = 5$செமீ. எனில் AB ஆவது

(a) 2.5 செமீ   (b) 5 செமீ   (c) 10 செமீ   (d) $5\sqrt{2}$ செமீ

If $\triangle ABC$ is an isosceles triangle with $\angle C = 90$ and $AC = 5$cm, then AB is

(a) 2.5 cm   (b) 5 cm   (c) 10 cm   (d) $5\sqrt{2}$ cm ✓

9. ஒரு நாற்கரமானது ஒரு சரிவகமாக அமைய தேவையான நிபந்தனை

(a) இரு பக்கங்கள் இணை

(b) இரு பக்கங்கள் இணை மற்ற இரு பக்கங்கள் இணையற்றவை

(c) எதிரெதிர் பக்கங்கள் இணை

(d) அனைத்து பக்கங்களும் சமம்

When proving that a quadrilateral is a trapezium it is necessary to show

(a) Two side are parallel

(b) Two sides are parallel and other two sides are non- parallel ✓

(c) opposite sides are parallel

(d) all sides are of equal length

10. $7x - 3y + 4 = 0$ என்ற நேர்க்கோட்டிற்கு செங்குத்தாக ஆதிப்புள்ளி வழிச்செல்லும் நேர்க்கோட்டின் சமன்பாடு

(a) $7x - 3y + 4 = 0$ (b) $3x - 7y + 4 = 0$

(c) $3x + 7y = 0$ (d) $7x - 3y = 0$

The equation of a line passing through the origin and perpendicular to the line $7x - 3y + 4 = 0$ is

(a) $7x - 3y + 4 = 0$ (b) $3x - 7y + 4 = 0$

(c) $3x + 7y = 0$ ✓   (d) $7x - 3y = 0$

11. $\sin\theta = \cos\theta$ எனில் $2\tan^2\theta + \sin^2\theta - 1$ இன் மதிப்பு

(a) $-\dfrac{3}{2}$ (b) $\dfrac{3}{2}$ (c) $\dfrac{2}{3}$ (d) $-\dfrac{2}{3}$

If $\sin\theta = \cos\theta$ then $2\tan^2\theta + \sin^2\theta - 1$ is equal to

(a) $-\dfrac{3}{2}$ (b) $\dfrac{3}{2}$ ✓   (c) $\dfrac{2}{3}$ (d) $-\dfrac{2}{3}$

12. ஒரு உள்ளீடற்ற உருளையின் வெளிப்புற மற்றும் உட்புற ஆரங்களின் கூடுதல் எனில் 14 செமீ மற்றும் அதன் தடிமன் 4 செமீ ஆகும். உருளையின் உயரம் 20செமீ எனில் அதனை உருவாக்கப் பயன்பட்ட பொருளின் கனஅளவு

(a) 5600 πசெமீ³   (b) 11200πசெமீ³ ✓   (c) 56 πசெமீ³   (d) 3600 πசெமீ³

In a hollow cylinder, the sum of the external and internal radii is 14 cm and the width is 4 cm. If its height is 20cm, the volume of the material in it is

(a) 5600 π cm^3,   (b) 11200π cm^3 (c) 56 π cm^3 (d) 3600 π cm^3

13. கொடுக்கப்பட்டவைகளில் எது தவறானது?

(a) $P(A) > 1$ (b) $0 \leq P(A) \leq 1$ (c) $P(\phi) = 0$ (d) $P(A) + P(\overline{A}) = 1$

Which of the following is incorrect?

(a) $P(A) > 1$ ✓   (b) $0 \leq P(A) \leq 1$ (c) $P(\phi) = 0$ (d) $P(A) + P(\overline{A}) = 1$

14. ஒரு நாணயத்தை மூன்று முறை சுண்டும் சோதனையில் 3 தலைகள் அல்லது 3 பூக்கள் கிடைக்க நிகழ்தகவு

(a) $\dfrac{1}{8}$ (b) $\dfrac{1}{4}$ (c) $\dfrac{3}{8}$ (d) $\dfrac{1}{2}$

Probability of getting 3 heads or 3 tails in tossing a coin 3 times is

(a) $\dfrac{1}{8}$ (b) $\dfrac{1}{4}$ ✓   (c) $\dfrac{3}{8}$ (d) $\dfrac{1}{2}$

PTA Model Question 05

1. $f(x) = (x+1)^3 - (x-1)^3$ குறிப்பிடும் சார்பானது

    (a) நேரிய சார்பு   (b) ஒரு கனச் சார்பு   (c) தலைகீழ்ச் சார்பு   (d) இருபடிச் சார்பு

    $f(x) = (x+1)^3 - (x-1)^3$ represents a function which is

    (a) linear   (b) cubic   (c) reciprocal   (d) quadratic ✓

2. யூக்ளிடின் வகுத்தல் துணைத்தேற்றத்தைப் பயன்படுத்தி, எந்த மிகை முழுவின் கனத்தையும் பயன்படுத்தி 9ஆல் வகுக்கும் போது கிடைக்கும் மீதிகள்

    (a) 0, 1, 8   (b) 1, 4, 8   (c) 0, 1, 3   (d) 1, 3, 5

    Using Euclid's division lemma, if the cube of any positive integer is divided by 9 the possible remainders are

    (a) 0, 1, 8 ✓   (b) 1, 4, 8   (c) 0, 1, 3   (d) 1, 3, 5

3. கூட்டுத்தொடர்வரிசையில் 31 உறுப்புகள் உள்ளன, அதன் 16-வது உறுப்பு m எனில் அந்தக் கூட்டுத் தொடர் வரிசையில் உள்ள எல்லா உறுப்புகளின் கூடுதல்

    (a) $16m$ (b) $62m$ (c) $31m$ (d) $\dfrac{31}{2}m$

    An A.P consists of 31 terms. If its 16th term is m, then the sum of all the terms of this

    (a) $16m$ (b) $62m$ (c) $31m$ ✓   (d) $\dfrac{31}{2}m$

4. $\dfrac{3y-3}{y} \div \dfrac{7y-7}{3y^2}$ என்பது

    (a) $\dfrac{9y}{7}$ (b) $\dfrac{9y^3}{21y-21}$ (c) $\dfrac{21y^2-42y+21}{3y^3}$ (d) $\dfrac{7(y^2-2y+1)}{y^2}$

    $\dfrac{3y-3}{y} \div \dfrac{7y-7}{3y^2}$ is

    (a) $\dfrac{9y}{7}$ ✓   (b) $\dfrac{9y^3}{21y-21}$ (c) $\dfrac{21y^2-42y+21}{3y^3}$ (d) $\dfrac{7(y^2-2y+1)}{y^2}$

5. $x^2 - 25 = 0$ -ன் தீர்வானது

    (a) மெய்யெண் தீர்வுகள் இல்லை   (b) சமமான மெய்யெண் தீர்வுகள்

    (c) சமமற்ற மெய்யெண் தீர்வுகள்   (d) கற்பனைத்தீர்வுகள்

    The solution of $x^2 - 25 = 0$ is

    (a) no real roots   (b) real and equal roots

    (c) real and unequal roots ✓   (d) imaginary roots

6. $A = \begin{vmatrix} 1 & 3 & 5 \\ 2 & 4 & 6 \end{vmatrix}$ எனும் கொடுக்கப்பட்ட அணிக்கு $(A^T)^T$ என்ற அணியின் வரிசை

    (a) 2×3 (b) 3×2 (c) 3×4 (d) 4×3

For the given matrix $A = \begin{bmatrix} 1 & 3 & 5 \\ 2 & 4 & 6 \end{bmatrix}$ the order of the matrix $\left(A^T\right)^T$ is

(a) 2×3 ✓   (b) 3×2 (c) 3×4 (d) 4×3

7. இரு வடிவொத்த முக்கோணங்கள் $\triangle ABC$ மற்றும் $\triangle PQR$ ஆகியவற்றின் சுற்றளவு முறையே 36 செமீ மற்றும் 24 செமீ ஆகும். $PQ = 10$ செமீ எனில் AB-ன் நீளம்

(a) $6\frac{2}{3}$ செமீ   (b) $\frac{10\sqrt{6}}{3}$ செமீ   (c) $66\frac{2}{3}$ செமீ   (d) 15 செமீ

The perimeters of two similar triangles $\triangle ABC$ and $\triangle PQR$ are 36 cm and 24 cm respectively. If $PQ = 10$ cm, then the length of AB is

(a) $6\frac{2}{3}$ cm   (b) $\frac{10\sqrt{6}}{3}$ cm   (c) $66\frac{2}{3}$ cm   (d) 15 cm ✓

8. $(5,7)$, $(3,p)$ மற்றும் $(6,6)$ என்பன ஒரு கோட்டமைந்தவை எனில் p-ன் மதிப்பு
(a) 3   (b) 6   (c) 9   (d) 12

If $(5,7)$, $(3,p)$ and $(6,6)$ are collinear, then the value of p is
(a) 3   (b) 6   (c) 9 ✓   (d) 12

9. $A(6, 1)$, $B(8,2)$, $C(9,4)$ மற்றும் $D(p, 3)$ என்பன ஒரு இணைகரத்தின் வரிசை கிரமமாக எடுத்துக்கொள்ளப்பட்ட முனைகள் எனில், p-ன் மதிப்பு

(a) -7 (b) 7   (c) 6   (d) -6

If the points $A(6, 1)$, $B(8,2)$, $C(9,4)$ and $D(p, 3)$ are the vertices of a parallelogram, taken in order then the value of p is

(a) -7 (b) 7 ✓   (c) 6   (d) -6

10. $a\cot\theta + b\csc\theta = p$ மற்றும் $b\cot\theta + a\csc\theta = q$ எனில் $p^2 - q^2$ -ன் மதிப்பு
(a) $a^2 - b^2$ (b) $b^2 - a^2$ (c) $a^2 + b^2$ (d) $b - a$

If $a\cot\theta + b\csc\theta = p$ and $b\cot\theta + a\csc\theta = q$, then $p^2 - q^2$ is equal to
(a) $a^2 - b^2$ (b) $b^2 - a^2$ ✓   (c) $a^2 + b^2$ (d) $b - a$

11. சமமான விட்டம் மற்றும் உயரம் உடைய ஓர் உருளை, ஒரு கூம்பு மற்றும் ஒரு கோளம் ஆகியவற்றின் கனஅளவுகளின் விகிதம்
(a) 1:2:3   (b) 2:1:3   (c) 1:3:2   (d) 3:1:2

The ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height is
(a) 1:2:3   (b) 2:1:3   (c) 1:3:2   (d) 3:1:2 ✓

12. கோளத்தின் புறப்பரப்பிற்குச் சமமானது
(a) கோளத்தின் மொத்தப்பரப்பு   (b) அரைக்கோளத்தின் மொத்தப்பரப்பு
(c) அரைக்கோளத்தின் புறப்பரப்பு   (d) இவற்றில் எதுவுமில்லை

C.S.A of solid sphere is equal to
(a) T.S.A of solid sphere ✓   (b) T.S.A of hemisphere
(c) C.S.A of hemisphere   (d) none of these

13. முதல் 20 இயல் எண்களின் விலக்க வர்க்கச் சராசரி
    (a) 32.25   (b) 44.25   (c) 33.25   (d) 30

Variance of first 20 natural numbers is
    (a) 32.25   (b) 44.25   (c) 33.25 ✓   (d) 30

14. பின்வருவனவற்றுள் எது தவறானது?
    (a) $P(A) > 1$ (b) $0 \leq P(A) \leq 1$ (c) $P(\phi) = 0$ (d) $P(A) + P(\overline{A}) = 1$

Which of the following is incorrect?
    (a) $P(A) > 1$ ✓   (b) $0 \leq P(A) \leq 1$ (c) $P(\phi) = 0$ (d) $P(A) + P(\overline{A}) = 1$

PTA Model Question 06

1. $g = \{(1,1),(2,3),(3,5),(4,7)\}$ என்ற சார்பானது $g(x) = \alpha x + \beta$ என கொடுக்கப்பட்டால் α மற்றும் β -ன் மதிப்புகள்
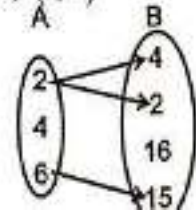
    (a) $(-1,2)$ (b) $(2,-1)$ (c) $(-1,-2)$ (d) $(1,2)$

    If $g = \{(1,1),(2,3),(3,5),(4,7)\}$ is a function given by $g(x) = \alpha x + \beta$ then the values of α and β are

    (a) $(-1,2)$ (b) $(2,-1)$ ✓   (c) $(-1,-2)$ (d) $(1,2)$

2. கொடுக்கப்பட்டுள்ள படம் குறிக்கும் சார்பு, ஒரு
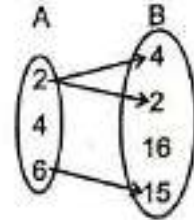   (a) மேல் சார்பு   (b) மாறிலி சார்பு

    (c) ஒன்றுக்கு ஒன்றான சார்பு   (d) சார்பு அல்ல

    The given diagram represents
    (a) an onto function   (b) a constant function
    (c) an one-one function   (d) not a function ✓

3. $A = 2^{65}$ மற்றும் $B = 2^{64} + 2^{63} + 2^{62} + \cdots + 2^0$ எனில் பின்வருவனவற்றில் எது உண்மை?
    (a) B ஆனது A-ஐ விட 2^{64} அதிகம்   (b) A மற்றும் B சமம்
    (c) B ஆனது A-ஐ விட 1 அதிகம்   (d) A ஆனது B-ஐ விட 1 அதிகம்

    If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + \cdots + 2^0$ then which of the following is true?
    (a) B is 2^{64} more than A (b) A and B are equal
    (c) B is larger than A by 1   (d) A is larger than B by 1 ✓

4. a, b, c என்பன ஒரு கூட்டுத் தொடர் வரிசையில் உள்ளன எனில், $\dfrac{a-b}{b-c} =$
    (a) $\dfrac{a}{b}$ (b) $\dfrac{b}{c}$ (c) $\dfrac{a}{c}$ (d) 1

If a, b, c are in A.P then $\dfrac{a-b}{b-c}$ is equal to

(a) $\dfrac{a}{b}$ (b) $\dfrac{b}{c}$ (c) $\dfrac{a}{c}$ (d) 1 ✓

5. கீழ்க்கண்ட வற்றுள் எது $y^2 + \dfrac{1}{y^2}$ -க்குச் சமம் இல்லை?

(a) $\dfrac{y^4 + 1}{y^2}$ (b) $\left(y + \dfrac{1}{y}\right)^2$ (c) $\left(y - \dfrac{1}{y}\right)^2 + 2$ (d) $\left(y + \dfrac{1}{y}\right)^2 - 2$

$y^2 + \dfrac{1}{y^2}$ is not equal to

(a) $\dfrac{y^4 + 1}{y^2}$ (b) $\left(y + \dfrac{1}{y}\right)^2$ ✓   (c) $\left(y - \dfrac{1}{y}\right)^2 + 2$ (d) $\left(y + \dfrac{1}{y}\right)^2 - 2$

6. $2X + \begin{bmatrix} 1 & 3 \\ 5 & 7 \end{bmatrix} = \begin{bmatrix} 5 & 7 \\ 9 & 5 \end{bmatrix}$ எனில், X என்ற அணியைக் காண்க.

(a) $\begin{bmatrix} -2 & -2 \\ 2 & -1 \end{bmatrix}$ (b) $\begin{bmatrix} 2 & 2 \\ 2 & -1 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 2 \\ 2 & 2 \end{bmatrix}$ (d) $\begin{bmatrix} 2 & 1 \\ 2 & 2 \end{bmatrix}$

Find the matrix X if $2X + \begin{bmatrix} 1 & 3 \\ 5 & 7 \end{bmatrix} = \begin{bmatrix} 5 & 7 \\ 9 & 5 \end{bmatrix}$

(a) $\begin{bmatrix} -2 & -2 \\ 2 & -1 \end{bmatrix}$ (b) $\begin{bmatrix} 2 & 2 \\ 2 & -1 \end{bmatrix}$ ✓   (c) $\begin{bmatrix} 1 & 2 \\ 2 & 2 \end{bmatrix}$ (d) $\begin{bmatrix} 2 & 1 \\ 2 & 2 \end{bmatrix}$

7. $\dfrac{x^2 - 25}{x + 3}$ என்பதை $\dfrac{x + 5}{x^2 - 9}$ -ஆல் வகுக்கும்போது கிடைப்பது

(a) $(x-5)(x-3)$ (b) $(x-5)(x+3)$ (c) $(x+5)(x-3)$ (d) $(x+5)(x+3)$

On dividing $\dfrac{x^2 - 25}{x + 3}$ by $\dfrac{x + 5}{x^2 - 9}$ is equal to

(a) $(x-5)(x-3)$ ✓   (b) $(x-5)(x+3)$ (c) $(x+5)(x-3)$ (d) $(x+5)(x+3)$

8. ΔABC -ல் AD ஆனது $\angle BAC$ யின் இருசமவெட்டி. $AB = 8$ செமீ, $BD = 6$ செமீ மற்றும் $DC = 3$ செமீ, எனில் பக்கம் AC -ன் நீளம்

(a) 6 செமீ   (b) 4 செமீ   (c) 3 செமீ   (d) 8 செமீ

In a ΔABC, AD is the bisector of $\angle BAC$. If $AB = 8\,cm$, $BD = 6\,cm$ and $DC = 3\,cm$, the length of the side AC is

(a) 6 cm   (b) 4 cm ✓   (c) 3 cm   (d) 8 cm

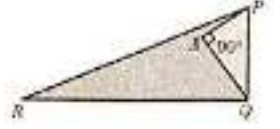9. கொடுக்கப்பட்டுள்ள படத்தில் $PR = 26$ செமீ, $QR = 24$ செமீ, $\angle PAQ = 90^0$, $PA = 6$ செமீ மற்றும் $QA = 8$ செமீ எனில் $\angle PQR$ ஐத் காண்க.

(a) 80° (b) 85° (c) 75° (d) 90°

In a given figure $PR = 26\,cm$, $QR = 24\,cm$, $\lfloor PAQ = 90^0$

$PA = 6\,cm$ and $QA = 8\,cm$. Find $\lfloor PQR$

(a) $80°$ (b) $85°$ (c) $75°$ (d) $90°$ ✓

10. கோட்டுத் துண்டு PQ-ன் சாய்வு $\dfrac{1}{\sqrt{3}}$ எனில் PQ-க்கு செங்குத்தான இருசம வெட்டியின் சாய்வு

(a) $\sqrt{3}$ (b) $-\sqrt{3}$ (c) $\dfrac{1}{\sqrt{3}}$ (d) 0

If slope of the line PQ is $\dfrac{1}{\sqrt{3}}$ then slope of the perpendicular bisector of PQ is

(a) $\sqrt{3}$ (b) $-\sqrt{3}$ ✓   (c) $\dfrac{1}{\sqrt{3}}$ (d) 0

11. ஒரு கோபுரத்தின் உயரத்திற்கும் அதன் நிழலின் நீளத்திற்கும் உள்ள விகிதம் $\sqrt{3} : 1$ எனில், சூரியனைக் காணும் ஏற்றக்கோண அளவானது

(a) $45°$ (b) $30°$ (c) $90°$ (d) $60°$

If the ratio of the height of a tower and the length of its shadow is $\sqrt{3} : 1$, then the angle of elevation of the sun has measure

(a) $45°$ (b) $30°$ (c) $90°$ (d) $60°$ ✓

12. r_1 அலகுகள் ஆரமுள்ள ஒரு கோளப்பந்து உருக்கப்பட்டு r_2 அலகுகள் ஆரமுள்ள 8 சம கோளப்பந்துகளாக ஆக்கப்படுகிறது எனில், $r_1 : r_2$ என்பது

(a) $2:1$ (b) $1:2$ (c) $4:1$ (d) $1:4$

A spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r_2 units. Then $r_1 : r_2$ is

(a) $2:1$ ✓   (b) $1:2$ (c) $4:1$ (d) $1:4$

13. ஒரு சீரான பகடை ஒரு முறை உருட்டப்படும்போது கிடைக்கும் எண், பகா எண் அல்லது பகு எண்ணாக இருப்பதற்கான நிகழ்தகவு

(a) 1   (b) 0   (c) $\frac{5}{6}$ (d) $\frac{1}{6}$

A fair die is thrown once. The probability of getting a prime (or) composite number is

(a) 1   (b) 0   (c) $\frac{5}{6}$ ✓   (d) $\frac{1}{6}$

14. கீழே கொடுக்கப்பட்டவைகளில் எது பரவல் அளவை இல்லை?

(a) வீச்சு   (b) திட்ட விலக்கம்

(c) கூட்டுச் சராசரி   (d) விலக்க வர்க்க சராசரி

Which of the following is not a measure of dispersion?

(a) range   (b) standard deviation

(c) arithmetic mean ✓   (d) variance

Standard 10

Time: 3.00 Hrs.   **MATHS**   Maximum Marks: 100

PART - I

Note: i) Answer all the 14 questions.   14×1=14
     ii) Choose the most suitable answer from the given four alternatives and write the option code with the corresponding answer.

1) If $A = \{a, b, c, d\}$, $B = \{2, 3\}$, $C = \{p, q, r, s\}$ then, $n[(A \cup C) \times B] =$
   1) 8   2) 20   3) 12   4) 16

2) Let f and g be two functions given by $f = \{(0, 1), (2, 0), (3, -4), (4, 2), (5, 7)\}$, $g = \{(0, 2), (1, 0), (2, 4), (-4, 2), (7, 0)\}$ then the range of fog is
   1) $\{0, 2, 3, 4, 5\}$ 2) $\{-4, 1, 0, 2, 7\}$ 3) $\{1, 2, 3, 4, 5\}$ 4) $\{0, 1, 2\}$

3) The sum of the exponents of the prime factors in the prime factorization of 1729 is
   1) 1   2) 2   3) 3   4) 4

4) If $A = 2^{65}$ and $B = 2^{64}+2^{63}+2^{62}+\ldots+2^{0}$ which of the following is true?
   1) B is 2^{64} more than A   2) A and B are equal
   3) B is larger than A by 1   4) A is larger than B by 1

5) If $(x-6)$ is the HCF of $x^2-2x-24$ and x^2-kx-6 then the value of k is
   1) 3   2) 5   3) 6   4) 8

6) The solution of $(2x-1)^2 = 9$ is equal to
   1) -1   2) 2   3) -1, 2   4) None of these

7) If a matrix has 20 elements, what are the possible orders it can have?
   1) 2   2) 6   3) 4   4) 0

8) In figure, if PR is tangent to the circle at P and O is the centre of the circle, then $\angle POQ$ is
   1) 120°   2) 100°   3) 110°   4) 90°

9) The value of m for which point (2, 3) lie on the line $2x-my+11 = 0$ is
   1) -5   2) 0   3) 3   4) 5

10) The probability of getting a job for a person is x/3. If the probability of not getting the job is 2/3 then the value of x is
   1) 2   2) 1   3) 3   4) 1.5

11) If the ratio of the height of a tower and the length of its shadow is $\sqrt{3}:1$, then the angle of elevation of the sun has measure
   1) 45°   2) 30°   3) 90°   4) 60°

12) The variance of the first 11 natural numbers is
   1) 121   2) 120   3) 10   4) 11

13) The ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height is
   1) 1:2:3   2) 2:1:3   3) 1:3:2   4) 3:1:2

14) Probability of $A \cap \bar{A}$ is
   1) $P(A) \times P(\bar{A})$ 2) $P(\bar{A})$ 3) $P(A) + P(\bar{A})$ 4) 0
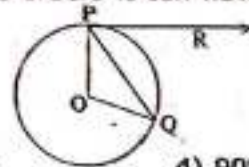
PART - II

Note: i) Answer 10 questions.   ii) Question Number 28 is compulsory.   10×2=20

15) If $A = \{-2, -1, 0, 1, 2\}$ and $f : A \to B$ is an onto function defined by $f(x) = x^2+x+1$ then find B.

16) Find the domain of the function $f(x) = \sqrt{1+\sqrt{1-\sqrt{1-x^2}}}$.

17) Find the first five terms of the following sequence:
   $a_1 = 1, a_2 = 1, a_n = \dfrac{a_{n-1}}{a_{n-2}+3}; n \geq 3, n \in N.$

18) Find the sum of all odd positive integers less than 450.

19) Find the excluded values of the following expression $\dfrac{7p+2}{8p^2+13p+5}$.

20) Determine the nature of the roots of the quadratic equation $15x^2+11x+2 = 0$.

21) In two concentric circles, a chord of length 16 cm of larger circle becomes a tangent to the smaller circle whose radius is 6 cm. Find the radius of the larger circle.

22) Find the intercepts made by the line $4x-9y+36 = 0$ on the coordinate axes.

23) Prove that $\dfrac{\sin^3 A + \cos^3 A}{\sin A + \cos A} + \dfrac{\sin^3 A - \cos^3 A}{\sin A - \cos A} = 2$.

24) The slant height of a frustum of a cone is 5 cm and the radii of its ends are 4 cm and 1 cm. Find its curved surface area.

25) Find the values of a, b, c, d, if $\begin{pmatrix} a & 1 \\ 2b & -2 \end{pmatrix} + \begin{pmatrix} 9 & c \\ 4 & d \end{pmatrix} = \begin{pmatrix} 10 & 3 \\ 6 & 5 \end{pmatrix}$.

26) In the figure, AD is the bisector of ∠BAC. If AB = 10 cm, AC = 14 cm and BC = 6 cm. Find BD and DC.

27) The standard deviation and mean of a data are 6.5 and 12.5 respectively. Find the co-efficient of variation.

28) Define: Co-prime numbers. If a and 24 are co-prime numbers, find all values of a.
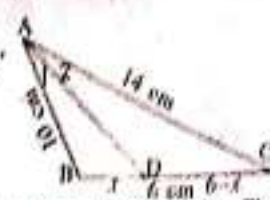
PART - III

Note: I) Answer 10 questions. II) Question Number 42 is compulsory. 10×5=50

29) The function 't' which maps temperature in Celsius (C) into temperature (F) is defined by t(C) = F, where $F = \frac{9}{5}C + 32$. Find

   (I) t(0)   (II) t(28)   (III) t(-10)   (IV) the value of C when t(C) = 212.

   (v) the temperature when the Celsius value is equal to the Fahrenheit value.

30) For the functions, f(x) = x²+4, g(x) = 3x+5 and h(x) = x-5 verify that (fog)oh = fo(goh).

31) Find the sum of the series (2³-1³)+(4³-3³)+(6³-5³)+...... to (i) n terms (ii) 8 terms.

32) If $A = \begin{pmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{pmatrix}$, show that $(AB)^T = B^T A^T$.

33) A pole has to be erected at a point on the boundary of a circular ground of diameter 20m in such a way that the difference of its distances from two diametrically opposite fixed gates P and Q on the boundary is 4m. Is it possible to do so? If answer is yes at what distance from the two gates should the pole be erected?

34) The perpendicular PS on the base QR of a △PQR intersects QR at S, such that QS = 3SR. Prove that 2PQ² = 2PR²+QR².

35) Find the area of the quadrilateral whose vertices are (-9, 0), (-8, 6), (-1, -2) and (-6, -3).

36) From a window (h metres high above the ground) of a house in a street, the angles of elevation and depression of the top and the foot of another house of the opposite side of the street are θ₁ and θ₂ respectively. Show that the height of the opposite house is $h\left(1 + \frac{\cot\theta_2}{\cot\theta_1}\right)$.

37) Arul has to make arrangements for the accommodation of 150 persons for his family function. For this purpose, he plans to build a tent which is in the shape of cylinder surmounted by a cone. Each person occupies 4 sq.m of the space on ground and 40 cu.meter of air to breathe. What should be the height of the conical part of the tent if the height of cylindrical part is 8m?

38) A card is drawn from a pack of 52 cards. Find the probability of getting a king or a heart or a red card.

39) If $S_n = (x+y)+(x^2+xy+y^2)+(x^3+x^2y+xy^2+y^3)+............$ n terms then prove that $(x-y)S_n = \left[\frac{x^2(x^n-1)}{x-1} - \frac{y^2(y^n-1)}{y-1}\right]$.

40) The marks scored by the students in a slip test are given below. Find the standard deviation of their marks.

x	4	6	8	10	12
f	7	3	5	9	5

41) Water is flowing at the rate of 15 km per hour through a pipe of diameter 14 cm into a rectangular tank which is 50m long and 44m wide. Find the time in which the level of water in the tanks will rise by 21 cm?

42) Find the square root of the following polynomial:

   $\left(\sqrt{15}x^2 + \left(\sqrt{3} + \sqrt{10}\right)x + \sqrt{2}\right)\left(\sqrt{5}x^2 + \left(2\sqrt{5}+1\right)x + 2\right)\left(\sqrt{3}x^2 + \left(\sqrt{2}+2\sqrt{3}\right)x + 2\sqrt{2}\right)$

PART - IV

Note: I) This section contains two questions. Each with two alternatives. 2×8=16
II) Answer both the questions choosing either of the alternatives.

43) A) Draw a triangle ABC of base BC = 8 cm, ∠A = 60° and the bisector of ∠A meets BC at D such that BD = 6 cm. (OR)

   B) Draw a circle of radius 4.5 cm. Take a point on the circle. Draw the tangent at that point using the alternate segment theorem.

44) A) Discuss the nature of solutions of the quadratic equation graphically.
   (2x-3) (x+2) = 0   (OR)

   B) Draw the graph of y = 2x²-3x-5 and hence solve 2x²-4x-6 = 0.

REVISION TEST - 2020
STANDARD - X

Reg. No. ☐☐☐☐☐☐

Time : 3.00 Hrs.   MATHEMATICS   Marks : 100

PART – A

Note : (i) Answer ALL the 14 questions.   14 X 1 = 14

(ii) Choose the correct answer and write the answer from four options.

1. If the ordered pairs $(a + 2, 4)$ and $(5, 2a + b)$ are equal then (a, b) is

   a) $(2, -2)$ b) $(5, 1)$ c) $(2, 3)$ d) $(3, -2)$

2. If $f(x) = x + 1$ then $f(f(f(y + 2)))$ is

   a) $y + 7$ b) $y + 3$ c) $y + 9$ d) $y + 5$

3. Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are

   a) 0,1,8   b) 1,4,8   c) 0,1,3   d) 1,3,5

4. The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \ldots$ is

   a) $\frac{1}{24}$ b) $\frac{1}{27}$ c) $\frac{2}{3}$ d) $\frac{1}{81}$

5. Which of the following should be added to make $x^2 + 64$ a perfect square

   a) $4x^2$ b) $16x^2$ c) $8x^2$ d) $-8x^2$

6. $A = \begin{pmatrix} y & 0 \\ 3 & 4 \end{pmatrix}$ and $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$. If $A^2 = 16 I$ then

   a) $y = -4$ b) $y = 4$ c) $y = 5$ d) $y = 16$

7. In the adjacent figure $\angle BAC = 90°$ and $AD \perp BC$ then

   a) $BD.CD = BC^2$ b) $AB.AC = BC^2$

   c) $BD.CD = AD^2$ d) $AB.AC = AD^2$
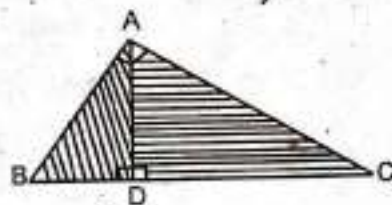
8. The two tangents from an external points P to a circle with centre at O are PA and PB. If $\angle APB = 70°$ then the value of $\angle AOB$ is

   a) $100°$ b) $110°$ c) $120°$ d) $130°$

9. $(2,1)$ is the point of intersection of two lines

   a) $x - y - 3 = 0; 3x - y - 7 = 0$ b) $x + y = 3; 3x + y = 7$

   c) $3x + y = 3; x + y = 7$ d) $x + 3y - 3 = 0; x - y - 7 = 0$

10. The equation of x axis is

a) $y = k$ b) $x = 0$ c) $y = 0$ d) $x = c$

11. $\tan\theta \operatorname{cosec}^2 \theta - \tan \theta$ is equal to

a) $\sec \theta$ b) $\cot^2 \theta$ c) $\sin \theta$ d) $\cot \theta$

12. If the radius of the base of a right circular cylinder is halved keeping the same height, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is

a) 1:2   b) 1:4   c) 1:6   d) 1:8

13. The T.S.A. of a sphere is 24 cm^2. If it is bisected into two equal hemispheres then the T.S.A. of each hemisphere is (cm^2)

a) 18   b) 12   c) 48   d) 6

14. Which of the following is incorrect?

a) $P(A) > 1$ b) $0 \leqslant P(A) \leqslant 1$ c) $P(\emptyset) = 0$ d) $P(A) + P(\bar{A}) = 1$

PART – B   **10 X 2 = 20**

Note : (i) Answer TEN questions

(ii) **Question No. 28 is compulsory.**

15. Given the function $f : x \to x^2 - 5x + 6$, evaluate

i) $f(2a)$ ii) $f(x - 1)$

16. If $A = \{-2, -1, 0, 1, 2\}$ and $f : A \to B$ is an onto function defined by $f(x) = x^2 + x + 1$ then find B.

17. Solve: $8x \equiv 1 \pmod{11}$.

18. The 7th term of a G.P. is 8 times the 4th term. It's 5th term is 48. Find 'a' and 'r'.

19. Simplify: $\dfrac{b^2 + 3b - 28}{b^2 + 4b + 4} \div \dfrac{b^2 - 49}{b^2 - 5b - 14}$.

20. In $\triangle ABC$, D and E are points on the sides AB and AC respectively such that DE || BC. If $\dfrac{AD}{DB} = \dfrac{3}{4}$ and AC = 15 cm find AE.

21. There are two paths that one can choose to go from Sarah's house to James house. One way is to take C street, and the other way requires to take A street and then B street. How much shorter is the direct path along C street? (Using figure)
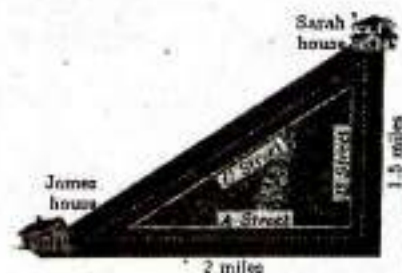
22. The line through the points (– 2, 6) and (4, 8) is perpendicular to the line through the points (8, 12) and (x, 24). Find the value of x.

23. Find the equation of a line whose intercepts on the x and y axes are $-5, \dfrac{3}{4}$.

24. Prove that $\dfrac{\sin A}{1 + \cos A} = \dfrac{1 - \cos A}{\sin A}$.

25. Find the angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of a tower of height $10\sqrt{3}$ m.

26. The slant height of a frustum of a cone is 5 cm and the radii of its ends are 4 cm and 1 cm. Find its curved surface area.

27. The range of a set of data is 13.67 and the largest value is 70.08. Find the smallest value.

28. A spherical iron ball is dropped into a vessel of base diameter 14 cm, containing water. The water level is increased by $9\dfrac{1}{3}$ cm. Find the radius of the ball.

<div align="center">PART – C   10 X 5 = 50</div>

Note : (i) Answer 10 questions.

(ii) Question No. 42 is compulsory.

29. If the function f:R→R is defined by $f(x) = \begin{cases} 2x + 7, & x < -2 \\ x^2 - 2, & -2 \leq x < 3 \\ 3x - 2, & x \geq 3 \end{cases}$, then find the values of i) f(4) + 2f(1)   ii) $\dfrac{f(1) - 3f(4)}{f(-3)}$

30. Verify that the compositions of functions is associative [(f∘g)∘h] = [f∘(g∘h)] if $f(x) = x^2$, g(x) = 3x + 5 and h(x) = x – 1.

31. In a Geometric progression, the 4th term is $\dfrac{8}{9}$ and the 7th term is $\dfrac{64}{243}$. Find the Geometric Progression.

32. There are 12 pieces of five, ten and twenty rupee currencies whose total value is ₹105. When first 2 sorts are interchanged in their numbers its value will be increased by ₹20. Find the number of currencies in each sort.

33. If α and β are the roots of $x^2 + 7x + 10 = 0$ find the values of

i) $\dfrac{\alpha}{\beta} + \dfrac{\beta}{\alpha}$ ii) $\dfrac{\alpha^2}{\beta} + \dfrac{\beta^2}{\alpha}$

34. In $\triangle ABC$, AD is the bisector of $\angle A$ meeting side BC at D. If AB = 10 cm, AC = 14 cm and BC = 6 cm, find BD.

35. PQ is a tangent drawn from a point P to a circle with centre O and QOR is a diameter of the circle such that $\angle POR = 120°$. Find $\angle OPQ$.

36. If the points A (– 3, 9), B (a,b) and C (4, – 5) are collinear and if a + b = 1, then find a and b.

37. Find the equation of a straight line parallel to Y axis and passing through the point of intersection of the lines $4x + 5y = 13$ and $x - 8y + 9 = 0$.

38. From a point on the ground, the angles of elevation of the bottom and top of a tower fixed at the top of a 30 m high building are 45° and 60° respectively. Find the height of the tower. ($\sqrt{3} = 1.732$)

39. Find the volume of the iron used to make a hollow cylinder of height 9 cm and whose internal and external radii are 21 cm and 28 cm respectively.

40. A cylindrical glass with diameter 20 cm has water to a height of 9 cm. A small cylindrical metal of radius 5 cm and height 4 cm is immersed it completely. Calculate the raise of the water in the glass?

41. Find the coefficient of variation of 24, 26, 33, 37, 29, 31.

42. A letter is chosen from the letters of the word 'ENTERTAINMENT'. Find the probability that the chosen letter is a vowel or T (repetition of letters is allowed)

PART – D

Note : Answer BOTH the questions: **2 X 8 = 16**

43. a) Construct a triangle similar to a given triangle PQR with its sides equal to $\dfrac{7}{4}$ of the corresponding sides of the triangle PQR (scale factor $\dfrac{7}{4} > 1$)

(OR)

b) Construct a $\triangle ABC$ such that AB = 5.5 cm, $\angle C = 25°$ and the altitude from C to AB is 4 cm.

44. a) Graph the quadratic equation $(2x - 3)(x + 2) = 0$ and state their nature of solution.

(OR)

b) Draw the graph of $y = x^2 - 5x - 6$ and hence solve $x^2 - 5x - 14 = 0$.

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STANDARD - X (MATHEMATICS)*

I.   1) d   2) d   3) a   4) b   5) b   6) a   7) c   8) b

        9) b   10) c   11) d   12) b   13) c   14) a

II.   15) $4a^2 - 10a + 6$, $x^2 - 7x + 12$ 16) {1, 3, 7}   17) 7, 18, 29, 40, ...

        18) 3, 2   19) $\dfrac{b-4}{b+2}$ 20) 6.43 cm   21) 1 mile   22) 4

        23) $3x - 20y + 15 = 0$ 25) $30°$ 26) 78.57 cm^2 27) 56.41   28) 7 cm

III.   29) 8, –31   31) 3, 2, $\dfrac{4}{3}$, . . .   32) 7, 3, 2   33) $\dfrac{29}{10}$, $\dfrac{-133}{10}$ 34) 2.5 cm

        35) $30°$ 36) 2, –1   37) $37x - 59 = 0$ 38) 21.96 m   39) 9702 cubic cm

        40) 1 cm   41) 14.4%   42) $\dfrac{8}{13}$

IV.   44) a) Real and unequal roots (OR) b) –2, 7

Note: Q.nos. 2, 6, 10, 13, 18, 28, 30 & 42 are Framed Questions