## General Instructions:

- There are 60 questions. All questions are compulsory.
- Shade the right answer in the OMR sheet provided
A) $\bigcirc$ B) $\bigcirc \quad$ C) $\bigcirc$ D) $\bigcirc$
- Time allotted is 60 minutes. Total Marks $=60$ Marks
Q.1) If the sides of a triangle are $150 \mathrm{~cm}, 120 \mathrm{~cm}$ and 200 cm , then its area is $\qquad$ $\mathrm{cm}^{2}$.
A) 8966.56
B) 8212.67
C) $24 \sqrt{6}$
D) 8834.45
Q.2) If two sides of triangle are 8 cm and 11 cm and its perimeter is 64 cm , then its area is A) $8 \sqrt{30} \mathrm{~cm}^{2}$.
B) $16 \sqrt{14098}$
C) $24 \sqrt{6}$
D) $9 \sqrt{2}$
Q.3) If two sides of a triangle are $18 \mathrm{~cm}, 10 \mathrm{~cm}$ and the perimeter is 42 cm , then its area is $-\mathrm{cm}^{2}$.
A) $8 \sqrt{30} \mathrm{~cm}^{2}$
B) $21 \sqrt{11} \mathrm{~cm}^{2}$
C) $24 \sqrt{6} \mathrm{~cm}^{2}$
D) $9 \sqrt{2} \mathrm{~cm}^{2}$
Q.4) If $\left(\frac{x}{y}\right)^{x-5}=\left(\frac{y}{x}\right)^{x-3}$, then $X=$ $\qquad$ .
A) ${ }^{\frac{1}{2}}$
B) 4
C) 2
D) $\frac{7}{2}$
Q.5) In the third quadrant, the nature of the $x$ and $y$ coordinates is $\qquad$ .
A) $x>0$ and $y>0$
B) $\mathrm{x}<0$ and $\mathrm{y}<0$
C) $\mathrm{x}<0$ and $\mathrm{y}>0$
D) $\mathrm{x}>0$ and $\mathrm{y}<0$
Q.6) If $x=2$ and $y=2$ is a solution of $2 x+a y=8$, then $a=$ $\qquad$ -
A) 3
B) 4
C) 5
D) 2
Q.7) In a right triangle ABC , right angled at $\mathrm{B}, \mathrm{M}$ is the midpoint of the hypotenuse AC . If the length of the hypotenuse is 12 cm , then the length of BM is $\qquad$ -.

A) 6 cm
B) 12 cm
C) 4 cm
D) 3 cm
Q.8) $A B C D$ is a trapezium in which $A B$ is parallel to $C D . B D$ is a diagonal and $E$ is the midpoint of AD . A line parallel to AB is drawn through E intersecting BC at F . If BC is 6 cm , then the length of BF is $\qquad$ .
A) 6 cm
B) 2 cm
C) 3 cm
D) 9 cm
Q.9) If the area of an equilateral triangle is $36 \sqrt{3} \mathrm{sq} \mathrm{cm}$, then the perimeter is $\qquad$ .
A) 36 cm
B) 37 cm
C) 37.2 cm
D) 36.2 cm
Q.10) If $2^{2 n-3}=\frac{1}{8^{n-3}}$ then $n=$ .
A) 3
B) $\frac{12}{5}$
C) 0
D) -2
Q.11) If $f(x)=2 x^{3}-13 x^{2}+17 x+12$, then the value of $f(x)$ at $x=-\frac{1}{2}$ is $\qquad$ —.
A) -1
B) 2
C) 1
D) 0
Q.12) If a point Q lies between two points P and R such that $\mathrm{PQ}=\mathrm{QR}$, then $\mathrm{PQ}=$ $\qquad$ .
A) $\frac{1}{4} \mathrm{PR}$
B) $\frac{2}{3} \mathrm{PR}$
C) $\frac{1}{2} \mathrm{PR}$
D) ${ }^{\frac{3}{4}} \mathrm{PR}$
Q.13) In $\triangle \mathrm{ABC}$ and $\triangle \mathrm{DEF}, \mathrm{AB}=\mathrm{DE}=5 \mathrm{~cm}, \angle B=\angle E=65^{\circ}$ and $\angle A=\angle D=45^{\circ}$. By which of the following congruence conditions are the two triangles congruent?

A) ASA
B) SSS
C) SAS
D) RHS
Q.14) ABCD is a quadrilateral. $\mathrm{P}, \mathrm{Q}, \mathrm{R}$ and S are the points on the sides $\mathrm{AB}, \mathrm{BC}, \mathrm{CD}$ and DA respectively such that $\frac{B P}{P A}=\frac{2}{1}, \frac{B Q}{Q C}=\frac{2}{1}, \frac{D R}{R C}=\frac{2}{1}$ and $\frac{D S}{S A}=\frac{2}{1}$. Then PQRS is a $\qquad$ .
A) Trapezium
B) Parallelogram
C) Rhombus
D) Rectangle
Q.15) If the height of an equilateral triangle is 8 cm , then its area is $\qquad$ -.
A) $42.8 \mathrm{~cm}^{2}$
B) $36.9 \mathrm{~cm}^{2}$
C) $92.2 \mathrm{~cm}^{2}$
D) $34.8 \mathrm{~cm}^{2}$
Q.16) If a cuboid of dimensions $20 \mathrm{~cm}, 10 \mathrm{~cm}$ and 5 cm is melted and cast into a cube, then the length of the edge of the cube so formed will be $\qquad$ .
A) 5 cm
B) 10 cm
C) 15 cm
D) 25 cm
Q.17) If $\frac{9^{n} \times 3^{5} \times 27^{3}}{3 \times 81^{4}}=81$, then $n=$ $\qquad$ .
A) $\frac{2}{5}$
B) 2
C) $\frac{7}{2}$
D) 4
Q.18) Which of the following graphs represents the line $x-2 y=3$ ?
A)

B)

C)

D)

Q.19) The measure of an angle is $24^{\circ}$ less than its complement, then the angle is $\qquad$ .
A) $66^{\circ}$
B) $156^{\circ}$
C) $33^{\circ}$
D) $78^{\circ}$
Q.20) In the figure below, $\angle \mathrm{AOC}$ and $\angle \mathrm{BOC}$ form a linear pair. If $\mathrm{x}=75^{\circ}$, then the value of y is
$\qquad$ .
A) $105^{\circ}$
B) $115^{\circ}$
C) $90^{\circ}$
D) $60^{\circ}$

Q.21) In $\triangle \mathrm{ABC}$ and $\triangle \mathrm{DEF}, \mathrm{AB}=\mathrm{DF}, \angle \mathrm{ACB}=70^{\circ}, \angle \mathrm{ABC}=50^{\circ}, \angle \mathrm{DEF}=70^{\circ}$ and $\angle \mathrm{EDF}=60^{\circ}$. By which of the following congruence conditions are the two triangles congruent?

A) SSS
B) ASA
C) SAS
D) RHS
Q.22) Following table shows the marks scored by a group of 90 students in a mathematics test of 100 marks.

| Marks | No. of Students |
| :---: | :---: |
| $0-20$ | 7 |
| $20-30$ | 10 |
| $30-40$ | 10 |
| $40-50$ | 20 |
| $50-60$ | 20 |
| $60-70$ | 15 |
| $70-100$ | 8 |

The probability that a student obtained less than 20 marks is $\qquad$ .
A) $\frac{7}{90}$
B) $\frac{11}{90}$
C) $\frac{23}{90}$
D) $\frac{20}{90}$
Q.23) The below are the temperature details that were recorded in Alaska in 11 days: $-21^{\circ} \mathrm{C}, 0^{\circ} \mathrm{C}, 2^{\circ} \mathrm{C},-15^{\circ} \mathrm{C}, 0^{\circ} \mathrm{C}, 5^{\circ} \mathrm{C},-18^{\circ} \mathrm{C}, 7^{\circ} \mathrm{C}, 0^{\circ} \mathrm{C},-32^{\circ} \mathrm{C}$ and $21^{\circ} \mathrm{C}$.

The mode temperature of the data is $\qquad$ .
A) $2^{\circ} \mathrm{C}$
B) $21^{\circ} \mathrm{C}$
C) $-18^{\circ} \mathrm{C}$
D) $0^{\circ} \mathrm{C}$
Q.24) The diameter of base and the height of a conical house are 14 m and 18 m respectively and the capacity of a rice bag is $33 \mathrm{~m}^{3}$. The number of such rice bags required to fill the conical house is $\qquad$ _.
A) 14
B) 24
C) 28
D) 25
Q.25) The value of $\sqrt[s]{16} \times \sqrt[s]{2}$ is $\qquad$ .
A) 1
B) 3
C) 2
D) 5
Q.26) If the polynomial $p(x)=x^{3}-6 x^{2}+2 x-4$ is divided by $(3 x-1)$, then the remainder is $\qquad$ $\frac{107}{27}$
A) $\overline{27}$
B) $92 \quad$ C) 10
D) $\mathbf{2 7}$
Q.27) Which of the following is the correct representation of locating the points (2, 4), (-5, 3), $(-1,-3),(2,-1),(-3,0)$ and $(0,-2)$ on the graph paper?
A)
B)

C)


D)

Q.28) A pineapple is priced at cost Rs 7 and a watermelon cost Rs 5 . Stella spends Rs 40 on these fruits. The linear equation which satisfies the given data is $\qquad$ .
A) $7 x+y=40$
B) $x+5 y=40$
C) $7 x-5 y=40$
D) $7 x+5 y=40$
Q.29) An angle is $14^{0}$ more than its complement, then the angle is $\qquad$ .
A) $62^{\circ}$
B) $72^{\circ}$
C) $52^{\circ}$
D) $42^{\circ}$
Q.30) In the figure below, OA and OB are opposite rays. Then the value of $x$ is $\qquad$ .

A) $40^{\circ}$
B) $35^{\circ}$
C) $30^{\circ}$
D) $25^{\circ}$
Q.31) In the figure below, AB is a line segment and P is its midpoint, D and E are points on the same side of AB such that $\angle \mathrm{BAD}=\angle \mathrm{ABE}$ and $\angle \mathrm{EPA}=\angle \mathrm{DPB}$. If $\mathrm{AD}=4.7 \mathrm{~cm}$, then $\mathrm{BE}=$
$\qquad$ —.

A) 4 cm
B) 7 cm
C) 4.7 cm
D) 2.7 cm
Q.32) A coin is tossed 1000 times with the following frequencies :

Head : 455 and Tail : 545
Then the probability of getting a head is $\qquad$ .
A) 0.455
B) 0.055
C) 0.545
D) 0.0455
Q.33) The marks scored by 20 students is $2,50,4,50,6,20,50,13,15,60,50,69,43,12,50$, 39, 65, 50, 13, 40
The frequency of 50 in the above data is $\qquad$ .
A) 3
B) 4
C) 6
D) 1
Q.34) The ratio of the slant heights of two cones is $5: 4$. If the radius and curved surface area of the first cone are 7 cm and $4070 \mathrm{~cm}^{2}$ respectively, then the curved surface area of the second cone whose radius is 14 cm is $\qquad$ .
A) $6512 \mathrm{~cm}^{2}$
B) $6412 \mathrm{~cm}^{2}$
C) $6262 \mathrm{~cm}^{2}$
D) $3451 \mathrm{~cm}^{2}$
Q.35) If $5^{a}=125$, then $5^{a-1}=$ $\qquad$ .
A) 25
B) 125
C) 625
D) 1625
Q.36) If both the abscissa and ordinate of a point are negatives, then the point lies in the $\qquad$ quadrant.
A) first
B) second
C) third
D) fourth
Q.37) A man's age is three times the sum of the ages of his two sons, one of whom is twice as old as the other. In 4 years the sum of the son's age will be half of their father's age. The age of younger son, elder son and father are $\qquad$ -.
A) 5 years, 10 years and 45 years
B) 4 years, 8 years and 36 years
C) 3 years, 6 years and 27 years
D) 6 years, 12 years and 54 years
Q.38) In the figure below, PQ is an incident ray and QR is the reflected ray. QN is normal to the surface AB . If $\angle \mathrm{PQR}=124^{\circ}$, then $\angle \mathrm{NQR}=$ $\qquad$ .

A) $62^{\circ}$
B) $28^{\circ}$
C) $32^{\circ}$
D) $64^{\circ}$
Q.39) In $\triangle \mathrm{ABC}, \angle A=\angle B=62 \frac{1}{2}$, then $\angle \mathrm{C}=$ $\qquad$ .
A) 45
B) 30
C) 55
D) 40
Q.40) In the figure below, $A B C D$ is a trapezium in which $A B \| C D, M$ is the mid-point of $A C$ and $N$ is the mid-point of $B D$. If $A B=12$ and $C D=14 \mathrm{~cm}$, then the length of $M N$ is $\qquad$ —.

A) 14 cm
B) 13 cm
C) 10 cm
D) 11 cm
Q.41) In the figure below, QPRS is a cyclic quadrilateral. R and S are two points on the semicircle described on PQ where PQ is the diameter. If $\angle \mathrm{QPR}=80^{\circ}$ and $\angle \mathrm{SQR}=60^{\circ}$, then the values of $\angle \mathrm{PQR}$ and $\angle \mathrm{QSR}$ are $\qquad$ respectively.

A) $10^{\circ}$ and $100^{\circ}$
B) $20^{\circ}$ and $80^{\circ}$
C) $30^{\circ}$ and $100^{\circ}$
D) $20^{\circ}$ and $90^{\circ}$
Q.42) A quadrilateral ABCD whose sides are $9 \mathrm{~cm}, 40 \mathrm{~cm}, 28 \mathrm{~cm}$ and 15 cm respectively. If the angle between the first two sides is a right angle, then the area of a quadrilateral is $\qquad$ .

A) $320 \mathrm{~cm}^{2}$
B) $316 \mathrm{~cm}^{2}$
C) $360 \mathrm{~cm}^{2}$
D) $306 \mathrm{~cm}^{2}$
Q.43) A rectangular sheet of paper of size $30 \mathrm{~cm} \times 18 \mathrm{~cm}$ can be made to form the curved surface of a right circular cylinder in two ways. If $V_{1}$ is the volume of the cylinder made by rolling the paper along the breadth of the sheet and $V_{2}$ is the volume of the cylinder made by rolling the paper along the length of the sheet, then the ratio of $V_{1}$ and $V_{2}$ is $\qquad$ .
A) $4: 3$
B) $5: 3$
C) $3: 2$
D) $4: 5$
Q.44) If $2^{n+4}-2\left(2^{n+2}\right)=2^{2}$, then $n=$ $\qquad$ .
A) 0
B) 2
C) -1
D) -2
Q.45) $9-a^{2}+2 a b-b^{2}=$ $\qquad$ .
A) $3(3 a+4 b)(3 a-4 b)$
B) $2 a(2 b+3 a)(2 b-3 a)$
C) $(3+a-b)(3-a+b)$
D) $3 a b(a+9 b)(a-9 b)$
Q.46) Which of the following represents the correct plotting of the points ( $-3,0$ ), (2, 2), ( $-2,-3$ ), $(2,4),(0,4)$ and $(-1,-3)$ on a graph paper?
A)

B)

C)

D)

Q.47) In the graph of the equations $3 x-2 y=4$ and $x+y-3=0$, the coordiantes of the point where the two lines intersect are $\qquad$ .
A) $(0,1)$
B) $(2,2)$
C) $(2,1)$
D) $(0,0)$
Q.48) PQRS is a quadrilateral. $\mathrm{A}, \mathrm{B}, \mathrm{C}$ and D are the mid-points of sides of $\mathrm{PQ}, \mathrm{QR}, \mathrm{RS}$ and SP respectively. If $P R=6 \mathrm{~cm}$ and $\mathrm{QS}=8 \mathrm{~cm}$, then the lengths of the sides of $A B C D$ are $\qquad$ -.
A) $3 \mathrm{~cm}, 4 \mathrm{~cm}, 3 \mathrm{~cm}$ and 4 cm
B) $3 \mathrm{~cm}, 7 \mathrm{~cm}, 3 \mathrm{~cm}$ and 7 cm
C) $5 \mathrm{~cm}, 8 \mathrm{~cm}, 5 \mathrm{~cm}$ and 6 cm
D) $3 \mathrm{~cm}, 7 \mathrm{~cm}, 3 \mathrm{~cm}$ and 4 cm
Q.49) In the figure below, $A B C D$ is a cyclic quadrilateral whose side $A B$ is a diameter of the circle. If $\angle \mathrm{ADC}=130^{\circ}$, then $\angle \mathrm{BAC}=$ $\qquad$ .

A) $40^{\circ}$
B) $35^{\circ}$
C) $50^{\circ}$
D) $45^{\circ}$
Q.50) Sanya has a piece of land which is in the shape of a rhombus. She wants her one daughter and one son to work on the land and produce different crops to suffice the needs of their family. She divided the land in two equal parts. If the perimeter of the land is 400 m and one of the diagonals is 160 m , then the area each of them will get is $\qquad$ -.
A) $2800 \mathrm{~m}^{2}$
B) $4600 \mathrm{~m}^{2}$
C) $4800 \mathrm{~m}^{2}$
D) $3800 \mathrm{~m}^{2}$
Q.51) The diameter of a roller is 40 cm and its length is 91 cm . The surface area of a garden is $1,14,40,000 \mathrm{sq} . \mathrm{cm}$. The number of rotations that the roller needed to flatten the surface of the garden when the roller was used twice is $\qquad$ -.
A) 1000
B) 3000
C) 2000
D) 1500
Q.52) A person standing on the bank of a river observes that the angle of elevation of the top of a tree standing on the opposite bank is $60^{\circ}$. When he moves 40 metres away from the bank, he finds the angle of elevation to be $30^{\circ}$. The height of the tree and the width of the river are respectively $\qquad$ .
A) 35.64 m and 10 m
B) 37.64 m and 30 m
C) 39.64 m and 20 m
D) 34.64 m and 20 m
Q.53) A and B each have certain number of oranges. A says to B, "if you give me 10 of your oranges, I will have twice the number of oranges left with you". B replies, "if you give me 10 of your oranges, I will have the same number of oranges as left with you". The number of oranges with $A$ and $B$ are $\qquad$ —.
A) 40 and 80
B) 30 and 50
C) 70 and 30
D) 70 and 50
Q.54) $\left(1-\frac{1}{n}\right)+\left(1-\frac{2}{n}\right)+\left(1-\frac{3}{n}\right)+.$. up to $n$ terms $=$ $\qquad$ $-$
A) $\frac{n+1}{2}$
B) $\frac{-2 n+1}{2}$
C) $-\frac{(n+1)}{2}$
D) ${ }^{\frac{n-1}{2}}$
Q.55) The ratio of one polynomial to another polynomial is called a rational expression. If the numerator of a rational expression is a quadratic polynomial with the zeroes 3 and -2 and the denominator is a quadratic polynomial with the zeroes $\frac{\frac{1}{2}}{2}$ and 3 , then the rational expression is
A) $\frac{2(x-2)}{(2 x-1)}$
B) $\frac{2(x+2)}{(2 x+1)}$
C) $\frac{x(x+2)}{(2 x-1)}$
D) $\frac{(x-2)}{(2 x-1)}$
Q.56) The sum of all natural numbers between 250 and 1000 which are exactly divisible by 3 is
$\qquad$ .
A) 154263
B) 146987
C) 156324
D) 156375
Q.57) If two numbers are respectively $10 \%$ and $25 \%$ more than a third number, then the first number as a percent of the second is $\qquad$ .
A) 78
B) 80
C) 88
D) 85
Q.58) If one bulb is taken out at random from a box of 600 electric bulbs containing 12 defective bulbs, then the probability of getting a non-defective bulb is $\qquad$ _.
A) 0.78
B) 0.65
C) 0.98
D) 0.85
Q.59) The arithmetic mean of 5 numbers is 27 . If one of the numbers is excluded, the mean of the remaining numbers is 25 . Find the excluded number.
A) 27
B) 25
C) 30
D) 35
Q.60) Amol is as much younger to Anil as he is older to Salil. If sum of ages of Anil and Salil is 52 years then age of Amol is?

1) 30
B) 28
C) 26
D) None of theses
