Babjani law.
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FOR GOD AND COUNTRY

ST. LAWRENCE HIGH SCHOOL

Second Term Examination

Sub: Mathematics **Class: IX** **FM: 75**

Duration: 2 hrs 30mins **Model answers** **Date:5.8.19**

Group- A

(I) Choose the correct option:- (1 X 6 = 6)

1. The two equations $4x + 3y = 25$ and $5x - 2y = 14$ have the solutions
   a) $x = 4, y = 3$
2. A retailer buys medicine at 20% discount on marked price and sells to buyer at marked price. The retailer makes a profit percentage
   b) 25
3. In case of drawing a histogram, the base of the rectangle of each class is
   d) class - size
4. In the triangle ABC, E is the midpoint of the median AD, the extended BE intersects AC at the point F. If AC = 10.5 cm, then the length of AF is
   a) 3 cm
5. A parallelogram , a rectangle and a triangular region stand on same base and between same parallel and if their area are P , R and T respectively, then
   a) P = R = 2T
6. A circular ring is 5 cm wide. The difference between outer and inner radius is
   a) 5 cm

(II) Fill in the blanks :- (1 x 8 = 8)

1) In the triangle PQR, $\angle PQR = 90°$, and PR = 10 cm. If S is the midpoint of PR, then the length of QS is 5
2) The ratio of cost price and selling price is 10 : 11. The profit percentage is 10% .
3) The class size of the classes 1 - 5 , 6 - 10 , is 5
4) A frequency polygon is drawn by the frequency of the class and mid-value of the class.
5) The length of the diagonal of square is $12\sqrt{2}$ cm. The area of the square is $144cm^2$.
6) If the area, perimeter and height of an equilateral triangle are a , s and h , then value of $\frac{2a}{sh}$ is 1/3.
7) The height of parallelogram is 1/3 rd of its base. If the area of the field is 192 sq. cm , in the shape of parallelogram, the height is 8cm.
8) The ratio of velocity of hour's hand and minute's hand at a clock is 12:1.

Group - B

(III) Answer the following questions:- (2 x 9 = 18)

1) For what value of k the equations $2x + 5y = 8$ and $2x - ky = 3$ will not have any solution?
   Ans-k=-5.

2) Nasrin makes a profit of 20% on selling price by selling a pen. Calculate her profit on cost price
   Ans- Profit on CP=(20/80)x100=25%
3) What is frequency density?
   Ans- Frequency of the class/Total frequency.
4) In a continuous frequency distribution table if the midpoint of a class is m, and the upper class boundary is u, then calculate the lower class boundary.
   Ans-Upper class boundary=m+d/2=u.
   Lower class boundary=m-d/2=m-(u-m)=2m-u.
5) The area of the parallelogram shaped region ABCD is 100 sq. units. P is the midpoint of side BC, then find the area of the triangular region ABP.
   Ans-Area of triangle ABC=1/2 x100sq unit=50sq units.(since AC is diagonal of ABCD).
   Area of triangle ABP=1/2 of ABC =1/2 X50=25 sq units.(since AP is median of ABC).
6) A square drawn on height of equilateral triangle. What is the ratio of area of triangle and square.
   Ans $\frac{\frac{\sqrt{3}\,a^2}{4}}{(\frac{\sqrt{3}\,a}{2})^2} = 1:\sqrt{3}$
7) The perimeter of a rectangle is 34 cm, and area is 60 sq.cm. What is the length of each diagonal.
   Ans- 2(L+B)=34cm and LxB=60 sq cm. solving we get L=12 and B=7 . Therefore diagonal=13cm.
8) What is the ratio of side of square and perimeter of circle when the length of diameter of circle is equal to the length of square.
   Ans- Let diameter of a circle= length of a square=a. So,ratio of side of a square and perimeter of a circle is- a:2x22/7xa/2 or7:22.
9) Perimeter of semicircle is 36 cm. What is the length of diameter?
   Ans- 22/7xr+2r=36 or r=7. So diameter=2r=2x7=14cm.

(IV) Answer the following questions :- (Any five) (3 x 5 = 15)

1) Solve by method of elimination :
   2x + 3y = 32 and 11y - 9x = 3
   Ans- x=7 and y=6.
2) Kamal bought a watch at ₹ 200. He wanted to make 30% profit by selling that watch. Calculate the amount of money by which Kamal will sell that watch.
   Ans-SP=130/100x200=260.
3) In a continuous frequency distribution table, if the midpoint of a class is 42 and class size is 10, then write the upper and lower limit of the class.
   Ans- UL=47 and LL=37.
4) The difference between the circumference and the diameter of a wheel is 75 cm. Calculate the length of the radius of the wheel.
   Ans-2x22/7xr-2r=75 or r=17.5cm.
5) If the perimeter of an isosceles right angled triangle is ($\sqrt{2}+1$) cm, calculate the length of the hypotenuse and area of the triangle.
   Ans- Let equal sides be a. So hypotenuse=a$\sqrt{2}$. Perimeter = 2a + a$\sqrt{2}$.
   BTP 2a + a$\sqrt{2}$ = $\sqrt{2}+1$ or a = $\frac{1}{\sqrt{2}}$.
   Hence hypotenuse= $\frac{1}{\sqrt{2}}\sqrt{2}$ =1 cm. and area= $\frac{a^2}{2} = \frac{1}{4}$ sqcm
6) P is any point on median AD of a triangle ABC. Prove that Δ ABP = Δ ACP
   Ans –In ABC,AD is the median. So ABD=ACD.-------(i)
   Again, in BPC, PD is the median.So BPD=DPC-------(ii)

Subtracting (ii) from (i), we get ABP=ACP.

Group – C

(V) Answer the following questions :- (Any Two) (4 x 2 = 8)

1) By drawing histogram, draw the frequency polygon of the frequency distribution table given below:- Ans- Students should draw histogram and frequency polygon taking classes along horizontal axis and frequency along vertical axis from the data given below.

Classes	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 – 30
Frequency	4	10	24	12	20	8

2) In a trapezium the length of each slant sides are 10 cm and the length of parallel sides are 5cm and 17 cm respectively. Calculate the area of the field in the shape of a trapezium and its diagonal.
Ans- Let AC be the diagonal of trapezium ABCD and DP and CQ be perpendiculars on AB.
ADP congruent to BQC (RHS).
So AP=BQ=917-5)/2=6cm.
Hence DP=8cm.
Therefore Area=1/2(5+17)x8=88sq cm.
And diagonal AC =$\sqrt{121+64} = \sqrt{185}$ =13.6 cm.

3) The length of diagonal of a rectangular land is 15m, and the difference between length and breadth is 3m. Calculate the perimeter and area.
Ans- Let L=x and B=y, so $x^2 + y^2 = 225$ and x-y=3. Solving we get x=12 and y= 9. Hence perimeter=2(12+9)=42m and area=12x9=108sq.m.

(VI) Answer the following questions:- (Any Four) (5 x 4 = 20)

1) State and prove the midpoint theorem.
Ans- refer to Ganit Prakash class 9.
2) In Δ PQR, $\angle PQR = 30°$, $\angle PRQ = 75°$, and QR = 8cm. Construct a rectangle equal in area to that triangle.
Ans- Traces of construction should be given.
3) The ratio between a two digit number and the number obtained on reversing its digits is 4 : 7. IF the difference between the digits of the number is 3. Find the number.
Ans-(10x+y)/(10y+x)=4/7 and y-x=3, solving we get x=3 and y=6. Hence the required number is 36.
4) A uniform circular track is the area bounded by two concentric circles. If the area of the track is 1144 $m^2$and its width is 14m, find the diameters of the two circles.
Ans- Inner radius=r and outer radius=r+14.
BTP $22/7(r+14)^2+22/7r^2=1144m^2$.
Solving we get, r=6m. Hence diameter of inner circle=2x6=12m and diameter of outer circle =2(6+14)=40m.
5) Prove that the area of triangular regions being on the same base and between same parallel is equal.
Ans- refer to Ganit Prakash class 9.