BLUEBELLS SCHOOL INTERNATIONAL

PREBOARD EXAMINATION

DECEMBER 2023-24

CLASS- X **Duration – 3 hrs**

SUBJECT- Maths **Max. Marks- 80**

SET - A

SYLLABUS –Real Numbers, Polynomials, Linear Equations, Quadratic Equations,Circles, Areas Related to circles, Trigonometry, Heights & Distance, Arithmetic Progression, Coordinate Geometry, Statistics and Probability

---

INSTRUCTIONS-

1. **This question paper was divided into 5 sections A-E**
2. **Section A has 20 questions carrying 01 mark each**
3. **Section B has 5 questions carrying 02 marks each**
4. **Section C has 6 questions carrying 03 marks each**
5. **Section D has 4 questions carrying 05 marks each**
6. **Section E has 3 case study based questions carrying 04 marks each**
7. **All questions are compulsory. However an internal choice in 2 q's of 5 marks,2q's of 3 marks and 2 q's of 2 marks has been provided.**
8. ***Draw a neat labelled fig* wherever required, use $\pi = 22/7$ wherever required if not *specified***

SECTION – A

Q1 One zero of the quadratic polynomial $2x^2 - 8x - m$ is 5/2 then the other zero is **1**

a)2/3 b) -2/3 c) 3/2 d)-15/2

Q2 The pair of equations $ax+2y=9$ and $3x+by=18$ represent parallel lines where a and b are integers, if **1**

a) a=b b)3a=2b c) 2a=3b d) ab=6

Q3 If a and b is coprime numbers then a^3 and b^3 are **1**

a)coprime b) not coprime c)even d)odd

Q4 If a line is drawn parallel to the base of the triangle BC of ΔABC cutting AB at X and **1**

AC at Y .If AB= 4BX and YC =2cm then the value of AY is

a)2cm b)4cm c)6cm d)8cm

Q5 A circle is drawn with origin as the centre passes through (13/2,0) . The point which does not lie in the interior of the circle is **1**

a) (-3/4,1) b) (2,7/3) c) (5,-1/2) d) (-6,5/2)

Q6 There are 576 boys and 448 girl in a school that are to divided into equal sections of either boys or girls alone. The total number of sections thus formed are **1**

a)22 b) 16 c) 36 d) 21

Q7 The tops of the poles of heights of 20m and 14m are connected by a wire. If the wire makes an angle of 30^0 with the horizontal, then the length of the wire is **1**

a)8m b)10m c)12m d)14m

Q8 The triangle whose vertices are (0,0) ,(2.7,0) and (0,4.9) is a/an

a)Equilateral triangle b) right angled triangle

c)Isosceles triangle d) obtuse angled triangle

Q9 AB and AC are two tangents to the circle with centre O and radius 8cm. If OA= 17cm then AC= **1**

a)15cm b) 9cm c)25cm d)$\sqrt{353}$ cm

Q10 Two natural numbers whose differences is 10 and the least common multiple is 420 are **1**

a)80 and 70 b) 70 and 60 c) 20 and 10 d)90 and 80

Q11 The ratio of the outer and inner perimeters of a circular path is 23 : 22. If the path is 5 metres wide, the diameter of the inner circle is **1**

(a) 55 m b) 110 m c) 220 m d) 230 m

Q12 Sinx - cos x =0 find the value of $\sin^4 x + \cos^4 x$ is **1**

½ b) ¼ c)1/3 d)3/4

Q13 The number of multiples of 4 lie between 10 and 250 are **1**

a)50 b) 60 c) 40 d) 30

Q14 A wheel makes 1000 revolutions in covering 0.88km. The radius of the wheel is **1**

7cm b)14cm c)21cm d)28cm

Q15 If a marble of radius 2.1cm is put into a cylindrical cup full of water of radius 5cm and height is 6cm, then the volume of water which flows out of cylindrical cup is **1**

a) 38.808cm^3 b)55.4 cm^3 c)19.4 cm^3 d)471.4 cm^3

Q16

Class interval	0-10	10-20	20-30	30-40
Frequency	15	18	11	16

1

From the distribution given the sum of lower limit of the median class and lower limit of the modal class is

30 b)10 c)20 d)40

Q17 The probability that a non leap year selected at random will contain 53 Sundays is 1

a) 1/7 b) 2/7 c) 3/7 d) 5/7

Q18 From a point Q, the length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm. The radius of the circle is 1

a) 7 cm b) 12 cm c) 15 cm d) 24.5 cm

Q19 **DIRECTION: In the question number 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option** 1

Assertion (A): The points (1,-3), (2,3) and (-4,6) are collinear.

Reasons (R) : Three points A,B and C are collinear if AB + BC =AC

a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

c) Assertion (A) is true but reason (R) is false.

d) Assertion (A) is false but reason (R) is true

Q20 ***DIRECTION: In the question number 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option*** 1

***Assertion (A)**: If HCF of two numbers is p and LCM isq then q/p is always a natural number*

Reasons (R) : *The HCF is always a factor if LCM*

a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

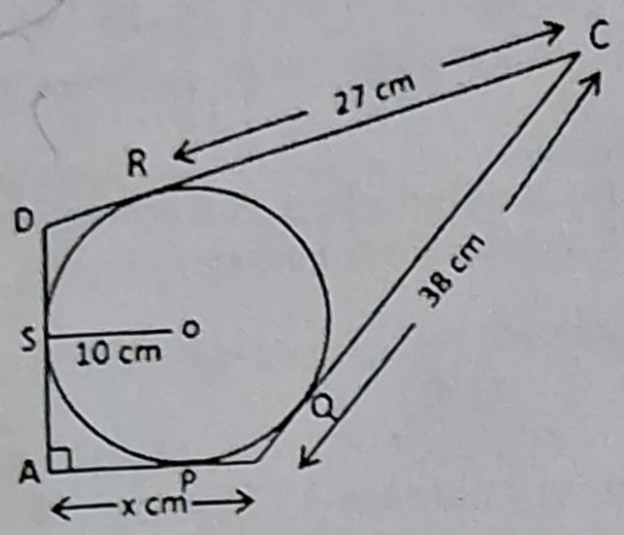
c) Assertion (A) is true but reason (R) is false.

d) Assertion (A) is false but reason (R) is true

SECTION- B

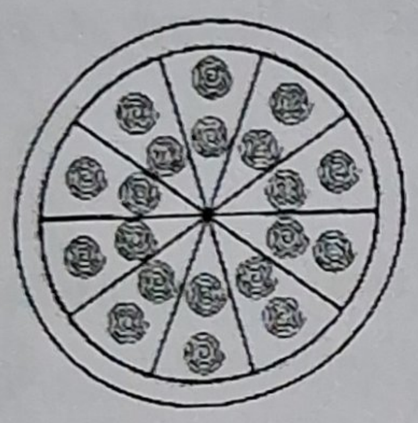
Q21 Prove that $\sqrt{3}$ is an irrational number 2

Q22 In the given fig. Quadrilateral ABCD circumscribing a circle with centre O and AD is perpendicular to AB . If radius is 10cm then find the value of x 2



Q23 A brooch is made with silver wire in the form of a circle with diameter 35 mm. The wire is also used in making 5 diameters which divide the circle into 10 equal sectors as shown in figure. **2**

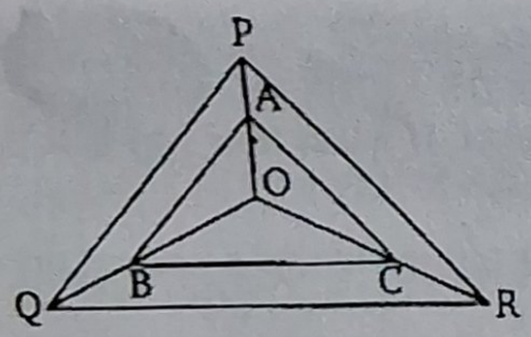
Find:



(*i*) the total length of the silver wire required.

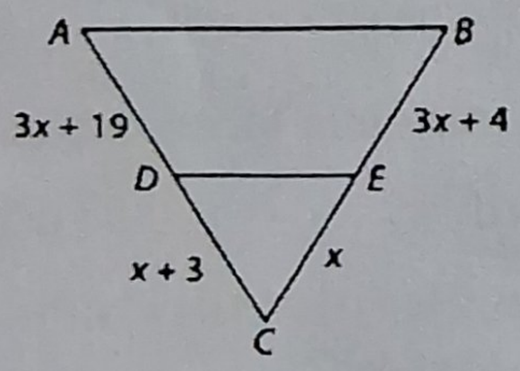
(*ii*) the area of each sector of the brooch.

Q24 In the given figure, A, B and C are points on OP, OQ and OR respectively such that AB || PQ and AC || PR. Show that BC || QR. **2**



OR

Find the value of x for which DE || AB is given figure



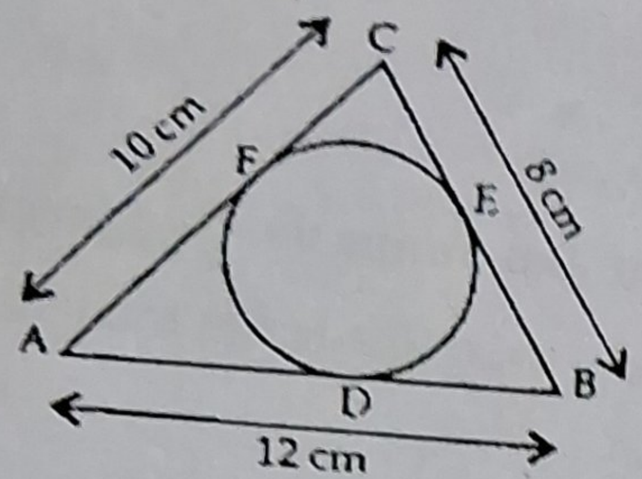
Q25 If p and q are zeroes of the equation $2y^2 + 7y + 5$ then find the value of $p + q + pq$ **2**

SECTION C

Q26 Find the smallest pair of 4 digit numbers such that the difference between them is 303 and their HCF is 101 **3**

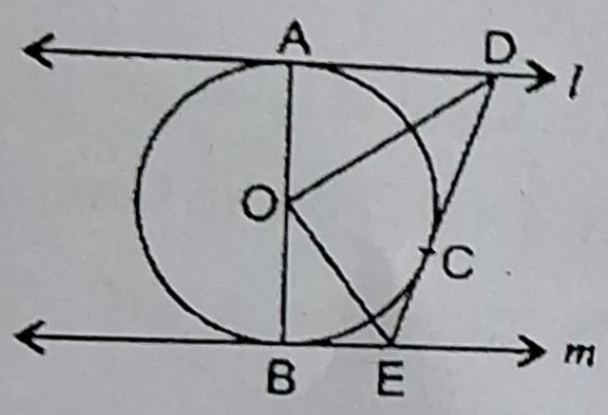
Three vertices of a parallelogram taken in order are (-1, 0), (3, 1) and (2, 2) respectively. Find the coordinates of fourth vertex. 3

Q28 In the given figure, a circle inscribed in ΔABC touches its sides AB, BC and AC at points D, E & F K respectively. If AB = 12 cm, BC = 8 cm and AC = 10 cm, then find the lengths of AD, BE and CF.) 3



OR

In the figure, l and m are two parallel tangents to a circle with centre O, touching the circle at A and B respectively. Another tangent at C intersects the line l at D and m at E. Prove that $\angle DOE = 90°$.



Q29 Prove $\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta} = \tan\theta$ 3

Q30 The angles of a triangle are in A.P., the least being half the greatest. Find the angles. 3

OR

In a certain A.P. the 24th term is twice the 10th term. Prove that the 36th term is twice the 16th term.

Q31 In a game the entry fee is Rs.5. The game consists of tossing a coin 3 times. If one or two heads show Shweta gets entry fee back. If she throws 3 heads she receives double the entry fee . Otherwise she will loose . For tossing a coin three times, find the probability that she 3

i)Loses the entry fee ii) gets double entry fee iii) just gets her entry fee

SECTION D

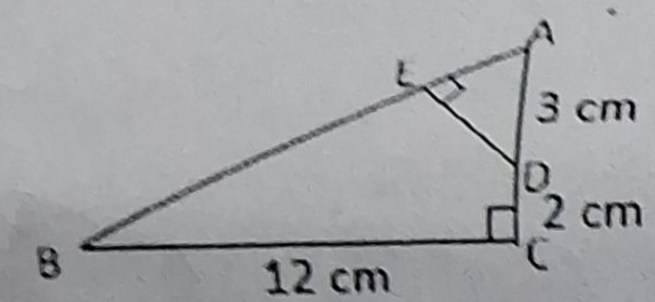
Q32 Draw the graph of the equation $3x - y = 7$ and $2x + 5y + 1 = 0$. Determine the coordinates of thew vertices of the triangle formed by these lines and the y axis. Shade the triangular region formed. 5

OR

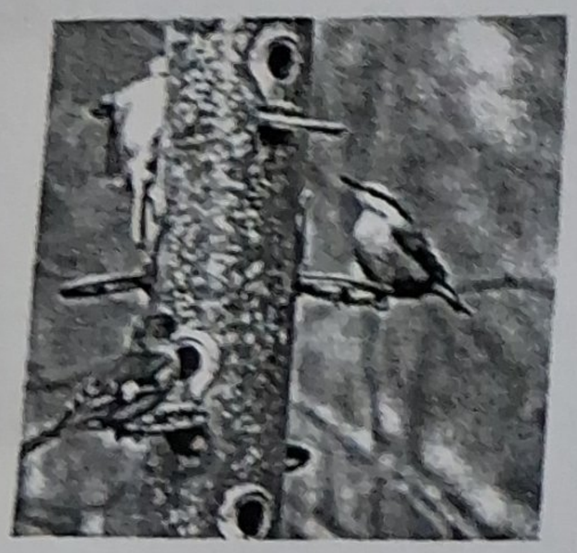
The students of a class are made to stand in rows. If 3 students are less in a row there would be 1 row less. If three students are less in a row there would be 2 rows more . Find the number of students in the class.

Q33 a) Prove that the line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points the other two sides are divided in the same ratio 5

b) In given fig. ΔABC is right angled at C and $DE \perp AB$. Prove that $\Delta ABC \sim \Delta ADE$ and hence find length of AE and DE.



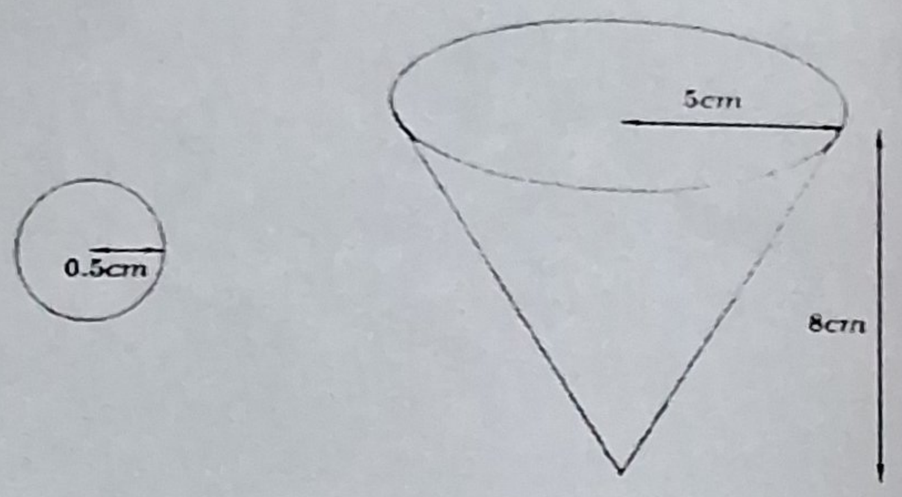
Q34 A bird feeder tube has a diameter of 8cm and height 28cm. The tube has 7 circular openings of 2cm diameter each for the birds to eat. The tube can hold 3kg of bird food. If the birds eat an average of 75gm of food per hour what will be the height of the food in the tube after 5 hours. 5



OR

A vessel is in the form of an inverted cone . Its height 8cm and the radius of the top is 5cm. It is filled with water upto the brim. When lead shots of which is a sphere is 0.5cm are dropped into the vessel one fourth of the water flows out. Find

the number of lead shots dropped in the vessel.



Q35 Find the missing frequency f_1 , f_2 , and f_3 in the following frequency distribution when it is given that $f_2 : f_3 = 4:3$ and mean =50. Total frequency =100 **5**

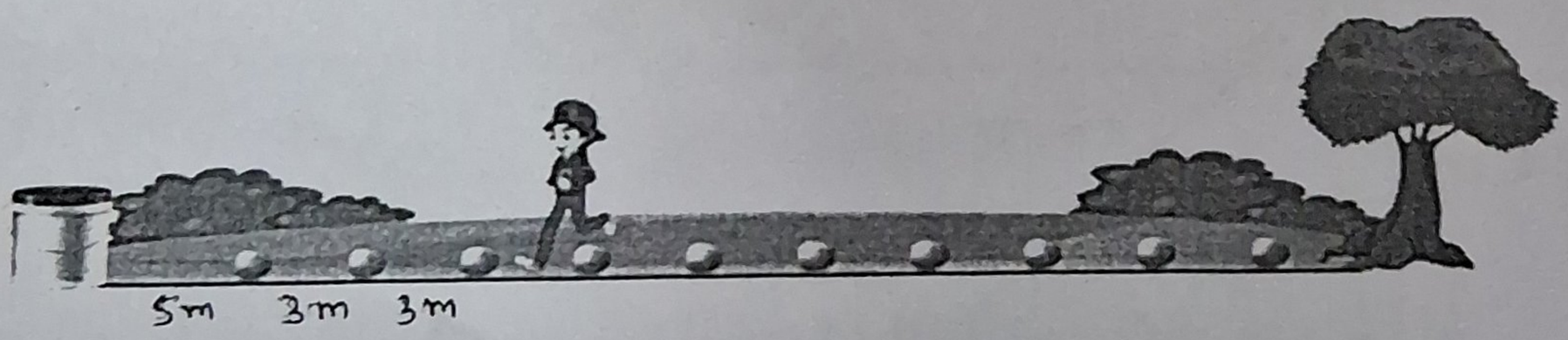
Class interval	0-20	20-40	40-60	60-80	80-100
frequency	17	f_1	f_2	f_3	19

SECTION E

Q36 **CASE STUDY BASED I** **4**

In a potato race, a bucket is placed at the starting point, which is 5 m from the first potato, and the other potatoes are placed 3 m apart in a straight line. There are ten potatoes in the line

A competitor starts from the bucket, picks up the nearest potato, runs back with it, drops it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it in, and she continues in the same way until all the potatoes are in the bucket. What is the total distance the competitor *has to run?*



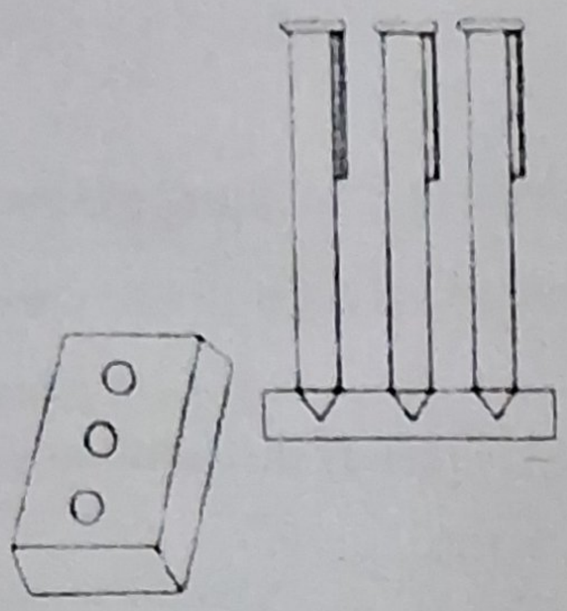
i)Find terms of AP formed in above situation 1

ii)What is the total distance the competitor has to run? 2

iii)Find distance coverd after 4 potato drop in the bucket? 1

Q37 Aanav went to a shopkeeper and asked him to make a pen stand as explained below. Pen stand must be of the cuboidal shape with three conical depressions, which can hold 3 pens. The **4**

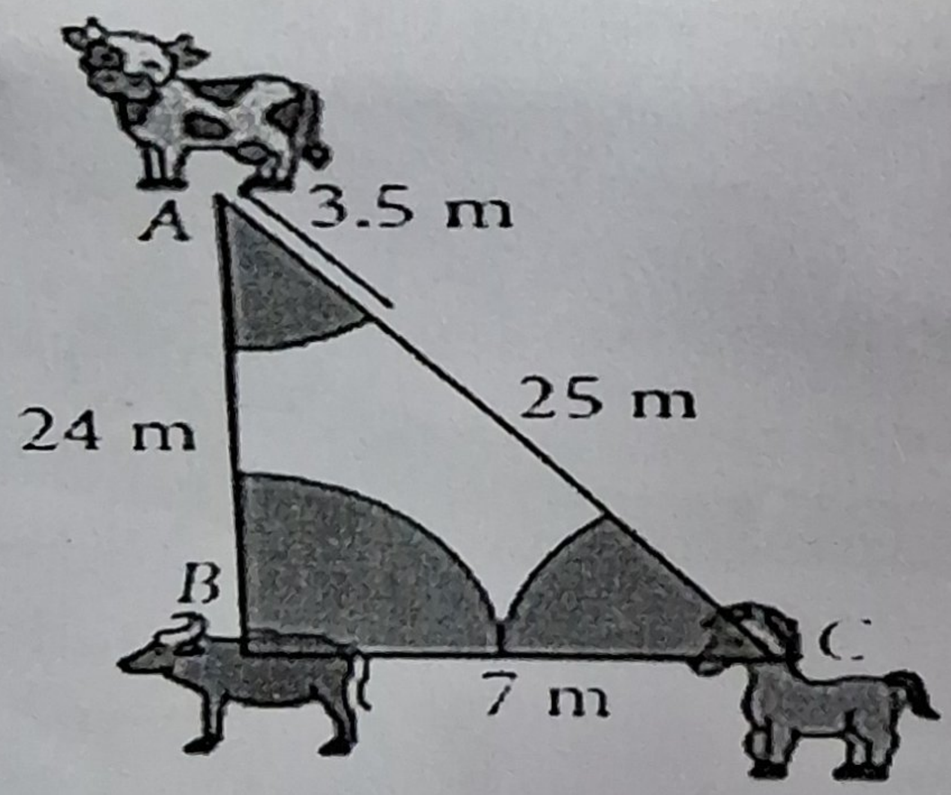
dimensions of the cuboidal part must be 20 cm x 15 cm x 5 cm and the radius and depth of each conical depression must be 0.6 cm and 2.1cm respectively



Based on the above information, answer the following questions.

i)Find the volume of the cuboidal part (1)
ii)Find the volume of conical depressions (2)
iii) Find the volume of the wood used in the entire stand (1)

Q38 *Deepak has a triangular shaped grass field. At the three corners a cow. A buffalo and a horse was tied separately by means of a rope of 3.5m to graze. The sides of the triangular field are 25m, 24m and 7m respectively.*Based on this above information answer the following questions: **4**



i)What is the area of the triangular field ?
ii)Area grazed by the cow, buffalo and the horse ?
iii)Find the area of the field that is not grazed ?