NAME:_____          R.NO:_____          SECTION_____

## CRPF PUBLIC SCHOOL, ROHINI

## CLASS 10

## MATHS (STANDARD)

## PRE-BOARD 1 (2023-24)

**Time: 3 hours**                                                    **Max Marks:80**

**General Instructions:**

1.  This Question Paper has 5 Sections A-E.

2. Section A has 20 MCQs carrying 1 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 based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.

7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E

8. Draw neat figures wherever required. Take $\pi$ =22/7 wherever required if not stated.

## **SECTION -A**

Q1. If the HCF of 65 and 117 is expressible in the form 65m-117, then the value of m is

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

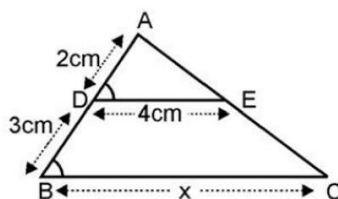Q2. A quadratic polynomial whose sum and product of zeroes are -3 and 4 is

a)  $x^2 - 3x + 12$          b) $x^2 + 3x + 4$          c) $2x^2 + x - 24$          d) none of these

Q3. The solution of the equations x+2y = 1.5 and 2x+y = 1.5 is

a)  x = 1 and y = 1      b) x = 1.5 and y= 1.5     c) x= 0.5 and y= 0.5    d) x=1.5 and y = 0.5

Q4. In the given figure, if DE‖BC , then x equals

a)  6 cm                  b) 10 cm            c) 8 cm                d) 12.5 cm

Q5. The positive value of k for which the equation $2x^2 + kx + 2 = 0$ has real roots .

a)  $k \geq 4$       b)$k \leq -4$       c) both a) and b)       d) k = 4

Q6. The sum of first 100 multiples of 9 is

a)  90900       b) 25250       c) 45450       d) 70500

Q7. A point P divides the join of A(5, -2) and B(9,6) are in the ratio 3:1. The coordinates of P are

a)  (4,7)       b) (8,4)       c) $(\frac{11}{2}, 5)$       d) (12,8)

Q8. If the distance between the points (8,p) and (4,3) is 5 then value of p is

a)  6       b) 8       c) 9       d)10

Q9. If $cos\theta = \frac{1}{2}$, $sin\emptyset = \frac{1}{2}$ then value of $\theta + \emptyset$ is

a)  30˚       b) 60˚       c) 90˚       d) 120˚

Q10.  $\frac{1+ tan^2 A}{1+cot^2 A} =$

a)  $sec^2 A$       b) -1       c) $cot^2 A$       d) $tan^2 A$

Q11. A kite is flying at a height of 60 m above the ground. The inclination of the string with the ground is 60˚. Find the length of the string , assuming that there is no slack in the string.
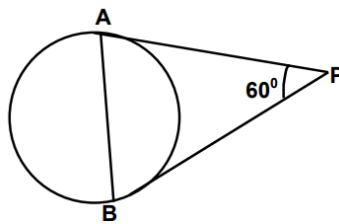
a)  $40\sqrt{3}$ m       b) $30\sqrt{3}\ m$       c) $20\sqrt{3}\ m$       d) $50\sqrt{3}\ m$

Q12. From a point Q, the length of the tangent to a circle is 40 cm and the distance of Q from the centre is 41 cm. find the radius of the circle.

a)  4 cm       b) 3 cm       c) 6 cm       d) 9 cm

Q13. In the figure given below, PA and PB are tangents such that PA=9 cm and $\angle APB = 60°$. Find the length of the chord AB.

a)  4 cm       b) 7 cm       c) 6 cm       d) 9 cm



Q14. The minute hand of a clock is 12 cm long. Find the area of the face of the clock described by the minute hand in 35 minutes.

a)  $265\ cm^2$       b) $266\ cm^2$       c) $264\ cm^2$       d) $270\ cm^2$

Q15. A sector is cut from a circle of radius 21 cm. the angle of the sector is 150˚. Find the length of the arc.

a)  56 cm       b) 57 cm       c) 55 cm       d) 58 cm

Q16. The class mark of a class is 10 and its class width is 6. The lower limit of the class is

   a)  5                 b) 7               c) 8           d) 10

Q17. One card is drawn from a well – shuffled deck of 52 cards. Find the probability of getting a king or a red card.

   a) $\frac{4}{13}$         b) $\frac{8}{13}$        c) $\frac{7}{13}$       d) $\frac{3}{13}$

Q18. In a bag, there are 100 bulbs out of which 30 are bad ones. A bulb is taken out of the bag at random. The probability of the selected bulb to be good is

   a)  0.50             b) 0.70          c) 0.30         d) 0.40

In the following questions, the Assertion and Reason have been put forward. Read the statements carefully and choose alternative from the following:

 (a) Both Assertion (A) and Reason (R) are true and R is the correct explanation of A

 (b) Both Assertion (A) and Reason (R) are true and R is not the correct explanation of A

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

 (d) Assertion (A) is false but Reason (R) is true.

Q19. Assertion: The sum of the length, breadth and height of a cuboid is 19 cm and its diagonal is $5\sqrt{5}$ $cm$. Its surface area is 236 $cm^2$.
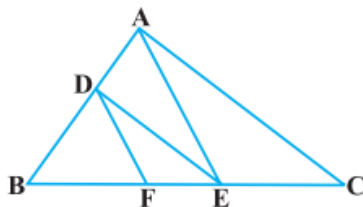
Reason: The lateral surface area of a cuboid is 2(l+b).

Q20. Assertion: 10th term of an AP is 41 whose first term is 5 and common difference is 4.

Reason: nth term of an AP is $a_n = a + (n-1)d$ , where a= first term, d= common difference.

## SECTION -B

Q21. If LCM(480, 672) = 3360, find HCF(480, 672).

Q22. In figure, DE∥AC and DF∥AE. Prove that $\frac{BF}{FE} = \frac{BE}{EC}$.



Q23. Prove that the tangents drawn at the ends of a diameter of a circle are parallel.

Q24. If $\cos(A - B) = \frac{\sqrt{3}}{2}$ and $\sin(A + B) = 1$ ,then find the value of A and B.

**OR**

Evaluate: $cot^2 30° - 2cos^2 30° - \frac{3}{4} sec^2 45° + \frac{1}{4} cosec^2 30°$.

Q25. An arc of a circle is of length is $5\pi$ cm and the sector it bounds has an area of $20\pi\ cm^2$. Find the radius of the circle.

**OR**

What is the angle subtended at the centre of a circle of radius 6 cm by an arc of length of $6\pi$ cm?

## SECTION- C

Q26. Prove that $\sqrt{3}$ is irrational.

Q27. Find the zeroes of the quadratic polynomial $6x^2 - 7x - 3$ and verify the relationship between the zeroes and the coefficients.

Q28. A two- digit number is 4 more than 6 times the sum of its digit. If 18 is subtracted from the number, the digits are reversed . find the number.

**OR**

Meena went to a bank to withdraw ₹2000. She asked the cashier to give her ₹ 50 and ₹100 notes only. Meena got 25 notes in all. Find how many notes of ₹ 50 and ₹100 she received.

Q29. A quadrilateral ABCD is drawn to circumscribe a circle.Prove that AB + CD = AD +BC.
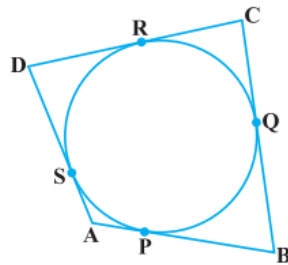


**OR**

Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line- segment joining the points of contact at the centre.

Q30. Prove that: $\frac{tan\theta}{1-cot\theta} + \frac{cot\theta}{1-tan\theta} = 1 + sec\theta\ cosec\theta$.

Q31. A bag contains 24 balls out of which x are white. If one ball is drawn at random the probability of drawing a white ball is y. 12 more white balls are added to the bag. Now if a ball is drawn from the bag, the probability of drawing a white ball is $\frac{5}{3}y$. Find the value of x.

## SECTION- D

Q32. An express train takes 1 hour less than a passenger train to travel 132 km between Mysore and Bangalore (without taking into consideration the time they stop at intermediate stations). If the average speed of the express train is 11 km/h more than that of the passenger train, find the average speed of the two trains.

**OR**

The area of a right-angled triangle is 600 sq. cm. if the base of the triangle exceeds the altitude by 10 cm, find the dimensions of the triangle.

Q33. Prove basic proportionality theorem.
Using the above theorem prove that the line joining the mid -point of one side of a triangle parallel to the other side bisects the third side.

Q34. A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 2 cm and the diameter of the base is 4 cm. Determine the volume of the toy. If a right circular cylinder circumscribes the toy, find the difference of the volumes of the cylinder and the toy. (Take $\pi$= 3.14)
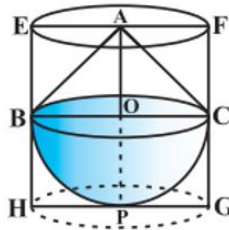


**OR**

A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively, and the slant height of the top is 2.8 m, find the area of the canvas used for making the tent. Also, find the cost of the canvas of the tent at the rate of ₹500 per m$^2$.

Q35. Find the missing frequencies $f_1$ and $f_2$ in table given below; it is being given that the mean of the given frequency distribution is 145.

| Class | 100-120 | 120-140 | 140-160 | 160-180 | 180-200 | Total |
|---|---|---|---|---|---|---|
| Frequency | 10 | $f_1$ | $f_2$ | 15 | 5 | 80 |

**SECTION -E**

Q36. Sumedh is a science graduate. Driving is his passion. After finishing his graduation he drives a taxi in Sikkim. He charges a fixed amount with the charge for the distance covered.



A person paid him ₹1100 for travelling 50 km by his taxi. On the next day a person paid him ₹1900 for travelling 90 km by his taxi.

    a) What are the fixed charges for his taxi?                                  (1)
    b) What is the rate per kilometre for travelling by his taxi?                 (1)
    c) If in peak tourist season sumedh increases the fixed charges by60%, what will be the cost of travelling 50 km by his taxi?                                  (2)

       **OR**

What will be the charges one has to pay for travelling 45 km?                 (2)

Q37. A building is made by keeping the lower window of a building at a particular height above the ground and upper window is constructed at some height vertically above the lower window. Position of both windows are shown in diagram:
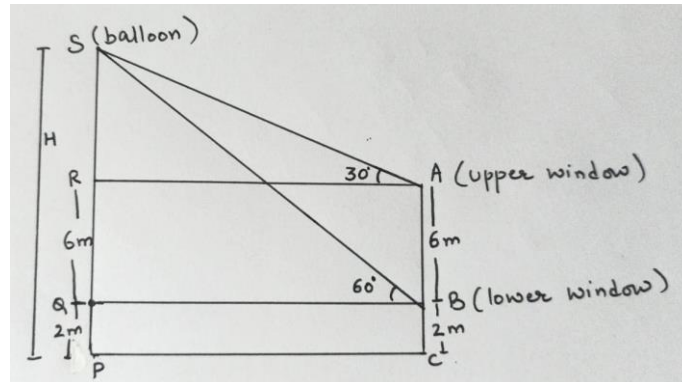


Both windows are designed and constructed in order to have proper sunlight.

At certain instant, the angle of elevation of balloon from these windows are shown. Balloon is flying at constant height H above the ground.

   a) Find the length AR in terms of H.                (1)
   b) Find the height H.                            (1)
   c) Find the distance of balloon from the lower window.    (2)
          OR
   Find the distance of balloon from the upper window.    (2)

Q38. One day Mansi drew the sketch of table tennis racket on a graph paper as below. Observe these sketches and answer the questions that follow:
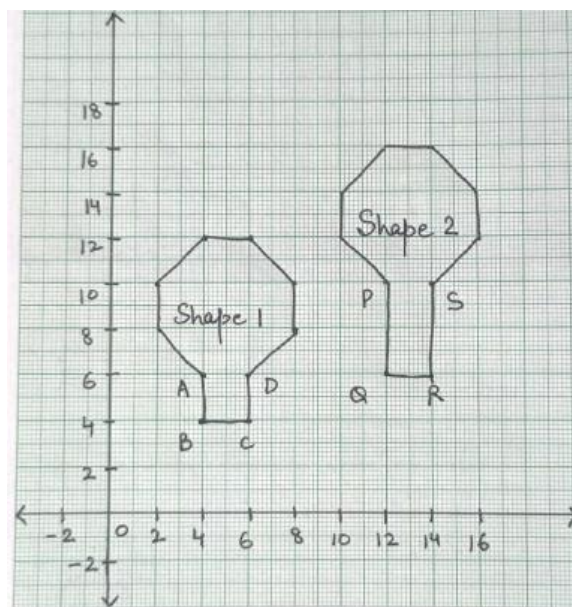


   a) Find the distance of the point P from y- axis.          (1)
   b) Are the two shapes congruent? Give reason.         (1)
   c) Find the distance between the points A and S.       (2)
         **OR**
   Find the length of the diagonal PR.               (2)