CRPF PUBLIC SCHOOL, ROHINI
CLASS 10
MATHS (BASIC)
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 π =22/7 wherever required if not stated.

SECTION A

Q1. The Product of two irrational numbers is

   a) Always irrational   b) always rational   c) rational or irrational   d) one

Q2. If HCF (26,169) = 13 then LCM (26, 169) is

   a) 26   b) 52   c) 338   d) 13

Q3. The value(s) of k for which the quadratic equation $2x^2+kx+2 = 0$ has equal roots, is

   a) 4   b) ± 4 c) -4   d) 0

Q4. The pair of equation x+2y+5 =0 and -3x-6y+1=0 have

   a) Unique Solution   b) exactly two solutions   c) infinitely many solutions   d) no solution

Q5. If the discriminant of a quadratic equation is less than zero then it has
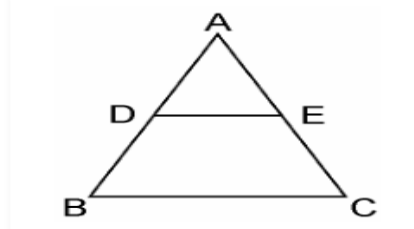
   a) Equal roots   b) real roots   c) no real roots   d) can't be determined

Q6. The distance of the point P (2,3) from Y - axis is

   a) 2 units   b) 3 units   c) 1 units   d) 5 units

Q7. D and E are respectively the points on the sides AB and AC of a triangle ABC such that AD= 3cm,

BD= 5cm, BC=12.8cm and DE||BC. The length of DE (in cm) is

a) 8 cm   b) 7.6 cm   c) 19.2 cm   d) 2.5 cm

Q8. Which of the following is NOT a similarity criterion of triangles?

a) AA   b) SAS   c) AAA   d) RHS

Q9. From an external point Q, the length of the tangent to a circle is 5 cm and the distance of Q from the center is 8 cm. The radius of the circle is

a) 39 cm   b) 3 cm   c) $\sqrt{39}$ cm   d) 7 cm

Q10. If sin A $=\frac{1}{2}$, then the value of cot A is

a) $\sqrt{3}$ b) $\frac{1}{\sqrt{3}}$ c) $\frac{\sqrt{3}}{2}$ d) 1

Q11. A pole 6m high casts a shadow $2\sqrt{3}m$ long on the ground, then the Sun's elevation is

a) 60°   b) 45°   c) 30°   d) 90°

Q12. (1+tan² A) is equal to

a) Sin^2 A   b) $\tan^2$ A   c) 1-$\sin^2$ A   d) $\sec^2$ A

Q13. Area of a sector of angle p (in degrees) of a circle with radius R is

a) $\frac{p}{180} \times 2\pi R$ b) $\frac{p}{180} \times \pi R^2$ c) $\frac{p}{360} \times 2\pi R$ d) $\frac{p}{720} \times 2\pi R^2$

Q14. The circumference of the circle is 44cm. The radius of the circle is

a) 7cm   b) 14 cm   c) 21cm   d) 2 cm

Q15. When a dice is thrown once, the probability of getting a composite number is

a) $\frac{1}{4}$ b) 0   c) $\frac{1}{6}$ d) $\frac{1}{3}$

Q16. In the formula: $\bar{x} = a + h \frac{\Sigma f_i u_i}{\Sigma f_i}$,   h is

   a) Class-size   b) frequency   c) assumed mean   d) mean

Q17. The radius of a sphere (in cm) whose volume is $36\pi cm^3$

   a) 3cm   b)$3\sqrt{3}$ cm   c)$3^{\frac{2}{3}}$ cm   d) $3^{\frac{1}{3}}$ cm

Q18. For the following distribution:

Class	0-5	5-10	10-15	15-20	20-25
Frequency	10	15	12	20	9

The upper limit of modal class is

   a) 15   b) 20   c) 10   d) 5

Q19. Assertion (A): The point (6,0) lies on x-axis

Reason (R) : The y coordinate of the point on x-axis is 0

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

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

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

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

Q20. Assertion (A): $\sqrt{p}$ is an irrational number, where p is a prime number

Reason (R): Square root of any prime number is an irrational number

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

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

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

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

SECTION B

Q21. On comparing the ratios, $\frac{a_1}{a_2}, \frac{b_1}{b_2}, \frac{c_1}{c_2}$, find out whether the following pair of linear equation is consistent or inconsistent: 2x - 3y = 8;4x - 6y = 9.

Q22. Prove that a line drawn through the mid-point of one side of a triangle parallel to another side bisects the third side.

Q22.A vertical pole of length 6m casts a shadow 4m long on the ground and at the same time a tower casts a shadow 28m long. Find the height of the tower.

Q23. Two Concentric circles are of radii 5 cm and 3 cm. find the length of the chord of the larger circle which touches the smaller circle.

Q24. Evaluate the following: $2 \tan^2 45° + \cos^2 30° - \sin^2 60°$.

Q25. Find the area of a sector of a circle with radius 6cm if angle of the sector is 60°.

OR

Q25. Find the area of a quadrant of a circle whose circumference is 22cm.

SECTION C

Q26. Prove $\sqrt{5}$ is an irrational number.

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

Q28. A fraction becomes $\frac{9}{11}$, if 2 is added to both the numerator and the denominator. If, 3 is added to both the numerator and the denominator it becomes $\frac{5}{6}$. Find the fraction.

OR

Q28. Meena went to a bank to withdraw Rs. 2000. She asked the cashier to give her Rs.50 and Rs.100 notes only. Meena got 25 notes in all. Find how many notes of Rs.50 and Rs.100 she received.

Q29. 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. $(\text{Sin A} + \text{cosec A})^2 + (\text{Cos A} + \text{sec A})^2 = 7 + \tan^2 A + \text{Cot}^2 A$

Q31. A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out of the box at random. What is the probability that the marble taken out will be

   a) Red?   b) white?   c) not green?

SECTION D

Q32.A train travels a distance of 480km at a uniform speed. If the speed had been 8km/h less, then it would have taken 3hours more to cover the same distance. Find the speed of the train.

OR

Q32. A pole has to be erected at a point on the boundary of a circular park of diameter 13 meters in such a way that the differences of its distances from two diametrically opposite fixed gates A and B on the boundary is 7meters. Is it possible to do so? If yes, at what distances from the two gates should the pole be erected.

Q33. State and prove Basic Proportionality Theorem.

 Prove the following using the theorem:

 In the given figure, DE||AC and DF||AE prove that. $\frac{BF}{FE} = \frac{BE}{EC}$.
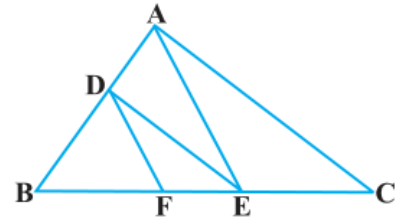
Q34. A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1m and 4m respectively, and the slant height of the top is 2.8m, find the area of the canvas used for making the tent. Also, find the canvas of the tent at the rate of Rs.500 per m^2. (Note that the base of the tent will not be covered with canvas.

OR

A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top, which is open, is 5 cm. it is filled with water up to the brim. When the lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, one-fourth of the water flows out. Find the number of lead shots dropped in the vessel.

Q35. The following table gives the literacy rate (in percentage) of 35 cities. Find the mean.

Literacy Rate (in %)	45-55	55-65	65-75	75-85	85-95
Number of Cities	3	10	11	8	3

SECTION E

Q36. Your friend Veer wants to participate in a 200m race. He can currently run that distance in 51 seconds and with each day of practice it takes him 2 seconds less. He wants to do in 31 seconds.

1) Form an A.P. for this situation.

2) Write its common difference

5

3) What is the minimum number of days he needs to practice till his goal is achieved

OR

Does 30 appears as a term of this A.P?

Q37. To conduct sports day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1m each. 100 flower pots have been placed at a distance of 1m from each other along AD, as shown in the figure. Niharika runs $1/4^{th}$ the distance AD on the 2nd line and posts a green flag. Preet runs $1/5^{th}$ the distance AD on the eight line and posts a red flag

1.What are the coordinates of Niharika?

2.What are the coordinates of Preet?
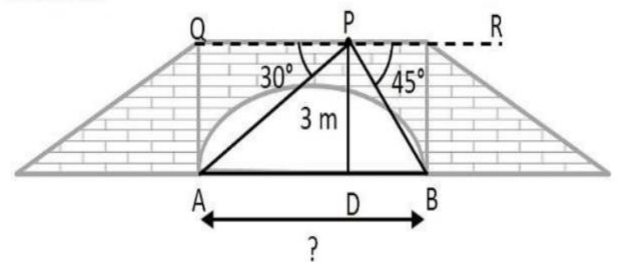
3. What is the distance between both the flags?
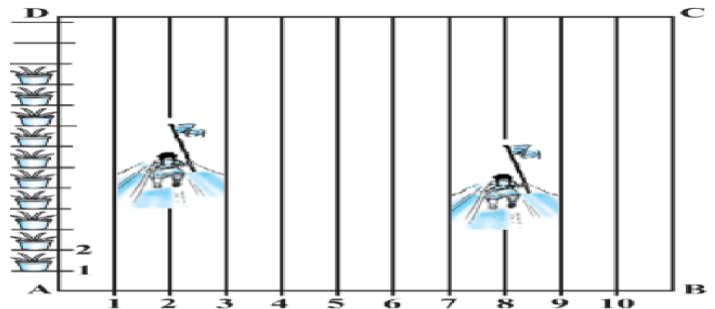
OR

If Rashmi has to post a blue flag, exactly halfway between the line segment joining the two flags, where should she post her flags?

Q38. From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45°, respectively. If the bridge is at a height of 3m from the banks, find the width of the river.

Based on the above information, answer the following questions:

1. What is the measure of ∠PAD?
2. If ∠RPB=45°, then, ∠PBD is also 45°. Why?
3. Find length of AD.

OR

Find length of BD.