INDIAN SCHOOL AL WADI AL KABIR

SECOND REHEARSAL EXAMINATION_SAMPLE PAPER(2025-26)

Class: X Sub: MATHEMATICS Max Marks: 80

General Instructions: Time:3 Hours

1. This Question Paper has 5 Sections A,B,C,D and E.
2. Section A has 20 Multiple Choice Questions (MCQs) carrying 01 mark each.
3. Section B has 5 Short Answer-I (SA-I) type questions carrying 02 marks each.
4. Section C has 6 Short Answer-II (SA-II) type questions carrying 03 marks each.
5. Section D has 4 Long Answer (LA) type questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Questions of 5 marks, 2 Questions 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 (consists of 20 questions of 1 mark each)

Q.1. The HCF and LCM of two numbers are 33 and 264 respectively. When the first number is completely divided by 2 the quotient is 33, then the other number is

(A) 134 **(B)** 132 **(C)** 154 **(D)** 164

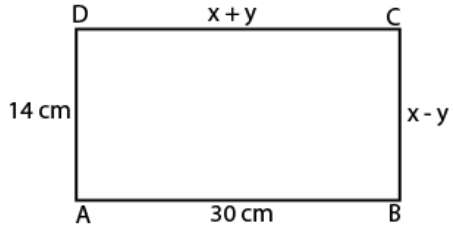
Q.2. If the zeroes of the quadratic polynomial $x^2 + (a+1)x + b$ are 2 and -3, then

(A) $a = 0, b = 6$ **(B)** $a = -6, b = 5$ **(C)** $a = 5, b = -6$ **(D)** $a = 0, b = -6$

Q.3. If p, q and r are rational numbers and $p \neq q \neq r$, then roots of the equation $(p^2 - q^2)x^2 - (q^2 - r^2)x + (r^2 - p^2) = 0$ are

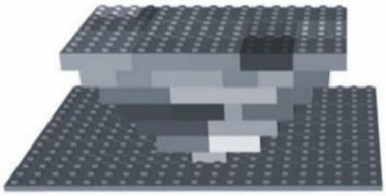
(A) $\frac{p}{q}, \frac{r}{p}$ **(B)** $\frac{p^2}{q^2}, \frac{r^2}{q^2}$ **(C)** $1, \frac{p^2 - q^2}{r^2 - p^2}$ **(D)** $-1, \frac{p^2 - r^2}{p^2 - q^2}$

Q.4. If the given figure ABCD is a rectangle, then the respective values of x and y are



(A) 22 cm, 8 cm **(B)** 20 cm, 10 cm **(C)** 12 cm, 18 cm **(D)** 2 cm, 28 cm

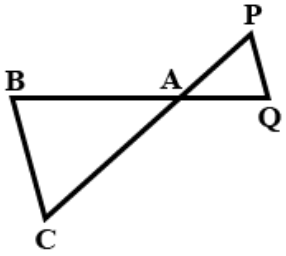
Q.5. The cylindrical bumps on top of Lego blocks are called studs.
Pragun has built Pragun has built a solid inverted lego pyramid as shown below. The number of studs in successive floors forms an arithmetic progression. Pragun figures out that the sum of the number of studs used in the first p floors is given by $(6p^2 - 2p)$. How many studs are there in the 5^{th} floor?



(Note: The figure is only for visual representation)

(A) 38 **(B)** 28 **(C)** 52 **(D)** 54

Q.6. In the given figure, $\Delta ACB \sim \Delta AQP$. If BC = 8cm, PQ = 4 cm, BA = 6.5 cm, AQ = 2.8 cm then the values of PA and CA are



(A) 3.25 cm and 5.6 cm **(B)** 6.25 cm and 4.6 cm **(C)** 3 cm and 5.2 cm **(D)** 6.25 cm and 1.6 cm

Q.7. If $x - 2y + k = 0$ is a median of the triangle whose vertices are at points A(-1 ,3), B(0, 4) and C(-5, 2) find the value of k.

(A) 8 **(B)** 10 **(C)** 6 **(D)** 12

Q.8. If three points (0, 0), (3 ,$\sqrt{3}$) and (3 , λ) forms an equilateral triangle, then λ equals

(A) 3 **(B)** $\sqrt{3}$ **(C)** 1 **(D)** -3

Q.9. If △ABC is right angled at C, then the value of cos (A + B) is

(A) $\sqrt{3}$ **(B)** 1 **(C)** 0 **(D)** $\frac{1}{\sqrt{3}}$

Q.10. If $cosec\,\theta - \cot\theta = \frac{1}{3}$, then the value of $(cosec\,\theta + \cot\theta)$ is

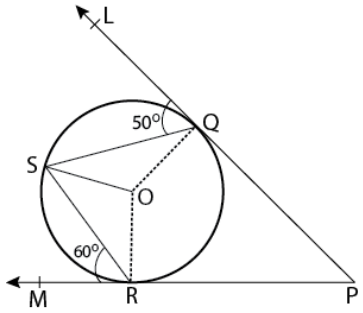
(A) 1 **(B)** $\sqrt{3}$ **(C)** 0 **(D)** 3

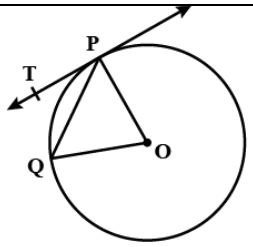
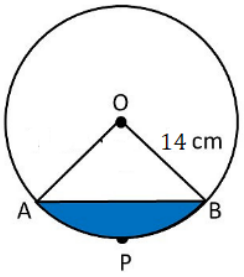
Q.11. The angle of elevation of the top of a 15 m high tower at a point 15 m away from the base of the tower is

(A) 60° **(B)** 45° **(C)** 30° **(D)** 0°

Q.12. If the angle between the two tangents drawn from an external point P to a circle of radius $'a'$ and centre $'O'$ is 60°, then the length of OP is

(A) a **(B)** $\frac{1}{2a}$ **(C)** $2a$ **(D)** a^2

Q.13.	In the figure, PQL and PRM are tangents to the circle with centre O at the points Q and R, respectively and S is a point on the circle such that ∠SQL = 50° and ∠SRM = 60°, then ∠QSR is equal to  **(A)** 40° **(B)** 60° **(C)** 50° **(D)** 30°
Q.14.	If the difference between the circumference and the radius of a circle is 37 cm,then using $\pi = \frac{22}{7}$ the circumference (in cm) of the circle is **(A)** 44 **(B)** 154 **(C)** 14 **(D)** 7
Q.15.	If the wheel of an engine of a train is $4\frac{2}{7}m$ in circumference makes seven revolutions in 4 seconds, then the speed of the train is **(A)** 33 km/h **(B)** 27 km/h **(C)** 37 km/h **(D)** 40 km/h
Q.16.	The mean of 25 observations is 9. If each observation is increased by 4, then the new mean is **(A)** 23 **(B)** 10 **(C)** 9 **(D)** 13
Q.17.	A box contains cards bearing numbers from 6 to 70. If one card is drawn at random from the box, then the probability that it bears an odd number less than 30 is **(A)** $\frac{12}{55}$ **(B)** $\frac{65}{12}$ **(C)** $\frac{12}{65}$ **(D)** $\frac{12}{70}$
Q.18.	The probability of selectingbthe rotten apple randomly from a heap of 900 apples is 0.18. What is the number of rotten apples in the heap? **(A)** 125 **(B)** 162 **(C)** 900 **(D)** 18
	DIRECTION: In question numbers 19 and 20, a statement of **Assertion (A)** is followed by a statement of **Reason (R).** Choose the correct option. (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 and 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.

Q.19.	***Statement A (Assertion):*** If we join two hemispheres of same radius along their bases, then we get a sphere. ***Statement R (Reason):*** A tank is made of the shape of a cylinder with a hemispherical depression at one end. The height and radius of the cylinder are respectively 1.45 m and radius is 30 cm. The total surface area of the tank is 3.3 m^2
Q.20.	***Statement A (Assertion):*** $-5, \frac{-5}{2}, 0, \frac{5}{2}$ ... ... is in Arithmetic Progression. ***Statement R (Reason):*** The terms of an Arithmetic Progression cannot have both positive and negative rational numbers.
SECTION B	
Section B consists of 5 questions of 2 marks each	
Q.21.	A forester wants to plant 66 apple trees, 88 banana trees and 110 mango trees in equal rows (in terms of number of trees). Also, he wants to make distinct roots of the trees (only one type of tree in one row). Find the minimum number of rows required.
Q.22.	In figure, ABC is an isosceles triangle in which AB = AC. E is a point on the side CB produced, such that FE ⊥ AC. If AD ⊥ CB, prove that: $AB \times EF = AD \times EC$.
Q.23.	(a) If $3x = cosec\ \theta$ and $\frac{3}{x} = \cot\theta$, then find the value of $3\left(x^2 - \frac{1}{x^2}\right)$. **(OR)** (b)If $\cot\theta = \frac{15}{8}$, then evaluate $\frac{(2+2\sin\theta)(1-\sin\theta)}{(1+\cos\theta)(2-2\cos\theta)}$.
Q.24.	In the given figure, O is the centre of the circle, PQ is a chord and PT is tangent to the circle at P. If $\angle POQ = 70°$, find $\angle TPQ$. 
Q.25.	(a) A wire is looped in the form of a circle of radius 28 cm. It is reverted into a square form. Determine the area of the square. **(OR)** (b) Find the area of the segment of a circle of radius 14 cm, if the corresponding arc APB is 22 cm. 

SECTION C

Section C consists of 6 questions of 3 marks each

Q.26. Prove that $3 - 2\sqrt{7}$ is irrational, given that $\sqrt{7}$ is irrational

Q.27. If one zero of the quadratic polynomial $f(x) = 4x^2 - 8kx + 8x + 9$ is negative of the other, then find zeroes of $kx^2 + 3kx + 2$.

Q.28. (a) If (6, 0) and (0, 2) are two of the points of intersections of two lines represented by a pair of linear equations. Then,

(i) How many points of intersections does the pair of linear equations have in total? Justify your answer.

(ii) Find the equation that represents one of the lines of the above pair. Show your work.

(OR)

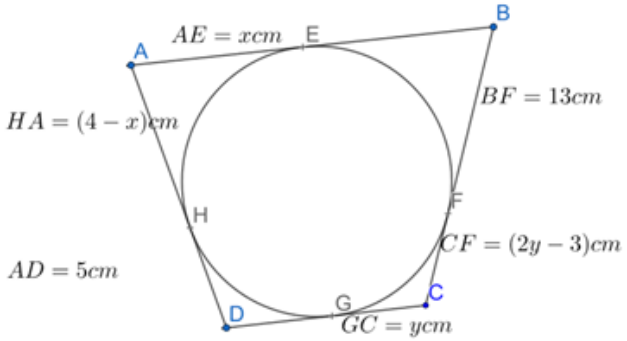
(b) The area of a rectangle reduces by 160 m^2 if its length is increased by 5 m and breadth is reduced by 4 m. However, if the length is decreased by 10 m and breadth is increased by 2 m, then its area is decreased by 100 m^2. Find the dimensions of the rectangle.

Q.29. Prove that :$(sin^4\,\theta - cos^4\,\theta + 1)cosec^2\,\theta = 2$.

Q.30. Prove that the tangents drawn at the end points of a chord of a circle make equal angles with the chord.

(OR)

In the figure, quadrilateral ABCD circumscribed the circle. Find the length of the side CD?

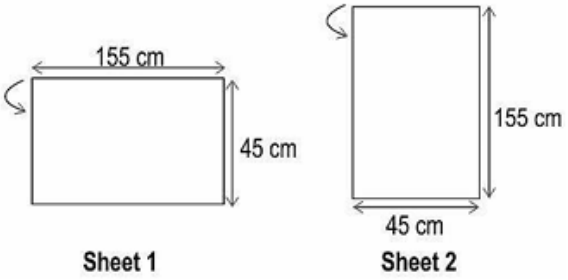
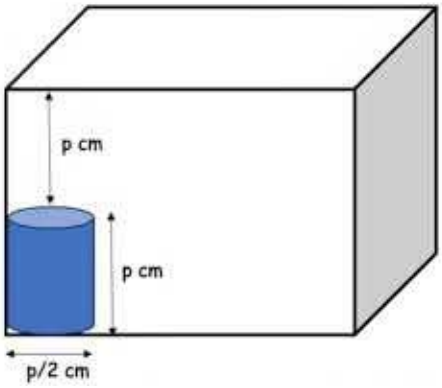


Q.31. The frequency distribution of daily rainfall in a town during a certain period is shown below.

Rainfall(in mm)	Number of days
0 – 20	7
20 – 40	x
40 – 60	10
60 – 80	4

Unfortunately, due to errors, the information on the 20 – 40 mm range got deleted from the data. If the mean daily rainfall for the period was 35 mm, find the number of days when the rainfall ranged between 20 – 40 mm. Show your work.

Section D consists of 4 questions of 5 marks each

Q.32.	An express train takes 1 hour less than the passenger train to travel 132 km between Mysore and Bengaluru (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)** In a class test, the sum of the marks obtained by P in Social Science and Science is 28. Had he got 3 more marks in Social Science and 4 marks less in Science, the product of marks obtained in two subjects would have been 180. Find the marks obtained in the two subjects separately.
Q.33.	P and Q are points on the sides AB and AC respectively of a triangle ABC. If AP = 2cm, PB = 4 cm, AQ = 3 cm, QC = 6 cm. Prove that BC = 3PQ.
Q.34.	Two rectangular sheets of dimensions 45 cm × 155 cm are folded to make hollow right circular cylindrical pipes, such that there is exactly 1 cm of overlap when sticking the ends of the sheet. Sheet 1 is folded along its length, while Sheet 2 is folded along its width. That is, the top edge of the sheet is joined with its bottom edge in both the sheets, as depicted by the arrow in the figure below. Both pipes are closed on both ends to form cylinders. i) Find the difference in the curved surface areas of the two cylinders. ii) Find the ratio of the volumes of the two cylinders formed.(Assume that the sheets have negligible thickness  **(OR)** Shown below is a cylindrical can placed in a cubical container.  i) How many of these cans can be packed in the container such that no more cans are fitted? ii) If the capacity of one can is 539 ml, find the internal volume of the cubical container.

Q.35. The marks obtained by 80 students of Class X in a mock test of Mathematics are given below in the table:

Marks	0 and above	10 and above	20 and above	30 and above	40 and above	50 and above	60 and above	70 and above	80 and above	90 and above	100 and above
Number of students	80	77	72	65	55	43	28	16	10	8	0

Find the median and the mode of the data.

SECTION E (Case study- based questions are compulsory)

Q.36. **Case study-based question 1:**

India is a competitive manufacturing location due to location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 20400 sets in 8th year and 29200 in 12th year.

Now, answer the following questions based on the above given information.

(i) What is the production during the first year. **(1 m)**

(ii) In which year the production is 16000. **(1 m)**

(iii-a) What is the total production in first three years. **(2 m)**

(OR)

(iii-b)Calculate the difference in production during 7^{th} year and 4^{th} year. **(2 m)**

Q.37. **Case study-based question 2:**

In a coffee shop, coffee is served in two types of cups. One is cylindrical in shape with diameter 7 cm and height 14 cm and the other is hemispherical with diameter 21 cm**.**

Based on the above information answer the following questions.

(i) Find the area of the base of the cylindrical cup? **(1 m)**

(ii-a) What is the capacity of the hemispherical cup? **(2 m)**

(OR)

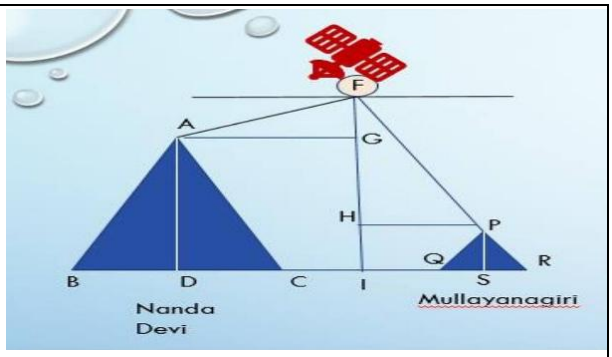
(ii-b) Find the capacity of the cylindrical cup? **(2 m)**

(III) What is the curved surface area of the cylindrical cup? **(1 m)**

Q.38. **Case study-based question 3:**

A Satellite flying at height h is watching the top of the two tallest mountains in Uttarakhand and Karnataka, them being Nanda Devi(height 7,816 m) and Mullayanagiri (height 1,930 m). The angles

of depression from the satellite, to the top of Nanda Devi and Mullayanagiri are 30° and 60° respectively. If the distance between the peaks of the two mountains is 1937 km, and the satellite is vertically above the midpoint of the distance between the two mountains.



Now, answer the following questions.

(i) What is the angle of elevation if a man is standing at a distance of 7816 m from Nanda Devi ? **(1 m)**

(ii) If a mile stone very far away from, makes 45° to the top of Mullanyangiri mountain. So, find the distance of this mile stone from the mountain. **(1 m)**

(iii-a) What is the distance of the satellite from the top of Nanda Devi? **(2 m)**

(OR)

(iii-b) What **is t**he distance of the satellite from the ground? **(2 m)**

Answers

ANSWERS

1	B	**2**	D	**3.**	D	**4**	A
5	C	**6**	A	**7**	A	**8**	B
9	C	**10**	D	**11**	B	**12**	C
13	A	**14**	A	**15**	B	**16**	D
17	C	**18**	B	**19**	B	**20**	C
21	12	**23**	a)1/3 b)225/64	**24**	35°	**25**	a)1936 b)154 sq.cm
27	X=-2, -1	**28**	(i)a)more than 1, coincident lines b)x+3y=6	**28**	l=70 m, b= 80 m	**30**	6 cm
31	23	**32**	Passenger train-33km/h Express train-44km/h	**32**	Social Science= 12 ,9 Science=16,19	**34**	(a)(i)110cm, (ii)124:441 (b) (i) 32 can (ii)21952cu.cm
36	(i) 5000 (ii) 6^{th} year (iii-a) 21600 (iii-b) 6600	**37**	(i) 38.5 $sq.cm$ (ii-a)2425.5 cm^3 (ii-b) 539 cm^3 (iii) 308 cm^3	**38**	(i) 35° (ii) 1930 m (iii-a) 1118.36 m (iii-b) 567 m		