KENDRIYA VIDYALAYA GACHIBOWLI, GPRA CAMPUS, HYD–32

SAMPLE PAPER 06 (2019-20)

SUBJECT: MATHEMATICS(241) (BASIC)

BLUE PRINT : CLASS X

Unit	Chapter	MCQ (1 mark)	FIB (1 mark)	VSA (1 mark)	SA–I (2 marks)	SA–II (3 marks)	LA (4 marks)	Total	Unit Total
Number system	**Real Numbers**	3(3)	--	--	--	**3(1)***	--	**6(4)**	**6(4)**
Algebra	**Polynomials**	2(2)	--	--	2(1)	3(1)	--	**7(4)**	**20(9)**
	Pair of Linear Equations in two variables	--	**1(1)***	--	--	3(1)	--	**3(1)**	
	Quadratic Equations	--		--	--	--	4(1)	**5(2)**	
	Arithmetic progression	--	--	1(1)	--	--	**4(1)***	**5(2)**	
Coordinate Geometry	**Coordinate Geometry**	2(2)	1(1)	--	--	**3(1)****	--	**6(4)**	**6(4)**
Trigonometry	**Introduction to Trigonometry**	--	2(2)	**1(1)***	**2(1)***	**3(1)***	--	**8(5)**	**12(6)**
	Some Applications of Trigonometry	--	--	--	--	--	4(1)	**4(1)**	
Geometry	**Triangles**	--	1(1)	1(1)	--	--	**4(1)***	**6(3)**	**15(7)**
	Circles	1(1)	--	--	2(1)	3(1)	--	**6(3)**	
	Constructions	--	--	--	--	**3(1)***	--	**3(1)**	
Mensuration	**Areas Related to Circles**	--	--	1(1)	2(1)	3(1)	--	**6(3)**	**10(4)**
	Surface Areas and Volumes	--	--	--	--	--	**4(1)***	**4(1)**	
Statistics & probability	**Statistics**	1(1)	--	--	--	--	4(1)	**5(2)**	**11(6)**
	Probability	1(1)	--	1(1)	2(1) **2(1)***	--	--	**6(4)**	
	Total	**10(10)**	**5(5)**	**5(5)**	**12(6)**	**24(8)**	**24(6)**	**80(30)**	**80(40)**

Note: * - Internal Choice Questions and Yellow shaded with ** - PISA type questions

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SAMPLE PAPER 06 (2019-20)

SUBJECT: MATHEMATICS **MAX. MARKS : 80**

CLASS : X **DURATION : 3 HRS**

General Instruction:

(i) All the questions are compulsory.

(ii) The question paper consists of 40 questions divided into 4 sections A, B, C, and D.

(iii) **Section A** comprises of 20 questions of **1 mark** each. **Section B** comprises of 6 questions of **2 marks** each. **Section C** comprises of 8 questions of **3 marks** each. **Section D** comprises of 6 questions of **4 marks** each.

(iv) There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each, and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.

(v) Use of calculators is not permitted.

SECTION – A

Questions 1 to 20 carry 1 mark each.

1. The decimal expansion of π

(a) is terminating (b) is non terminating and recurring

(c) is non terminating and non recurring (d) does not exist.

2. The product of L.C.M and H.C.F. of two numbers is equal to

(a) Sum of numbers (b) Difference of numbers

(c) Product of numbers (d) Quotients of numbers

3. What is the H.C.F. of two consecutive even numbers

(a) 1 (b)2 (c) 4 (d) 8

4. A quadratic polynomial can have at most …….. zeroes

(a) 0 (b) 1 (c) 2 (d) 3

5. Which are the zeroes of $p(x) = (x – 1)(x – 2)$:

(a) 1, –2 (b) – 1, 2 (c) 1, 2 (d) –1, –2

6. x–axis divides the join of A(2, –3) and B(5, 6) in the ratio

(a) 3 : 5 (b) 2 : 3 (c) 2 : 1 (d) 1 : 2

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

(a) 6 (b) 0 (c) both (a) and (b) (d) none of these

8. TP and TQ are the two tangents to a circle with center O so that angle $\angle POQ = 130^0$. Find $\angle PTQ$.

(a) 50^0 (b) 70^0 (c) 80^0 (d) none of these

9. Weights of 40 eggs were recorded as given below:

Weights(in gms)	85 – 89	90 – 94	95 – 99	100 – 104	105- 109
No. of eggs	10	12	12	4	2

The lower limit of the median class is

(a) 90 (b) 95 (c) 94.5 (d) 89.5

10. Cards are marked with numbers 1 to 25 are placed in the box and mixed thoroughly. What is the probability of getting a number 5?

(a) 1 (b) 0 (c) $\frac{1}{25}$ (d) $\frac{1}{5}$

11. The value of y for which the points A(1, 4), B(3, y) and C(–3, 16) collinear is _____

12. If ΔABC is right angled at B, then the value of cos(A + C) is ____

13. If tanA = $\frac{4}{3}$, then the value of cosA is _____

14. In ΔABC, DE || BC and AD = 4cm, AB = 9cm. AC = 13.5 cm then the value of EC is _____

15. The value of k for which the quadratic equation $4x^2 - 3kx + 1 = 0$ has real and equal roots is _____

OR

If the pair of equations 2x + 3y = 5 and 5x + $\frac{15}{2}$y = k represent two coincident lines, then the value of k is _____

16. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find the area of the sector formed by the arc

17. A bag contains lemon flavoured candies only. Malini takes out one candy without looking into the bag. What is the probability that she takes out a lemon flavoured candy?

18. In ΔABC, right-angled at B, AB = 5 cm and $\angle$ACB = 30° then find the length of the side BC.

OR

If sin 3θ = cos (θ – 6°) here, 3θ and (θ – 6°) are acute angles, find the value of θ.

19. For what value of p, are 2p + 1, 13, 5p – 3 three consecutive terms of an AP?

20. The areas of two similar triangles ΔABC and ΔDEF are 144 cm^2 and 81 cm^2, respectively. If the longest side of larger ΔABC be 36 cm, then find the longest side of the similar triangle ΔDEF .

SECTION – B

Questions 21 to 26 carry 2 marks each.

21. 15 cards, numbered 1, 2, 3, ..., 15 are put in a box and mixed thoroughly. A card is drawn at random from the box. Find the probability that the card drawn bears (i) an even number (ii) a number divisible by 3.

OR

Find the probability of getting 53 Fridays in a leap year.

22. A card is drawn at random from a pack of 52 playing cards. Find the probability that the card drawn is neither an ace nor a king.

23. The length of minute hand of a clock is 14 cm. Find the area swept by the minute hand in three minutes. [Use = 22/7]

24. Evaluate: sin 25° cos 65° + cos 25° sin 65°

OR

If tan A = cot B, prove that A + B = 90°.

25. If the product of the zeroes of the polynomial $ax^2 - 6x - 6$ is 4, then find the value of a. Also find the sum of zeroes of the polynomial.

26. The two tangents from an external point P to a circle with centre O are PA and PB. If APB = 70°, what is the value of AOB?

SECTION – C

Questions 27 to 34 carry 3 marks each.

27. Prove that $2+5\sqrt{3}$ is an irrational number.

OR

Find the least number which when divided by 12, 16, 24 and 36 leaves a remainder 7 in each case.

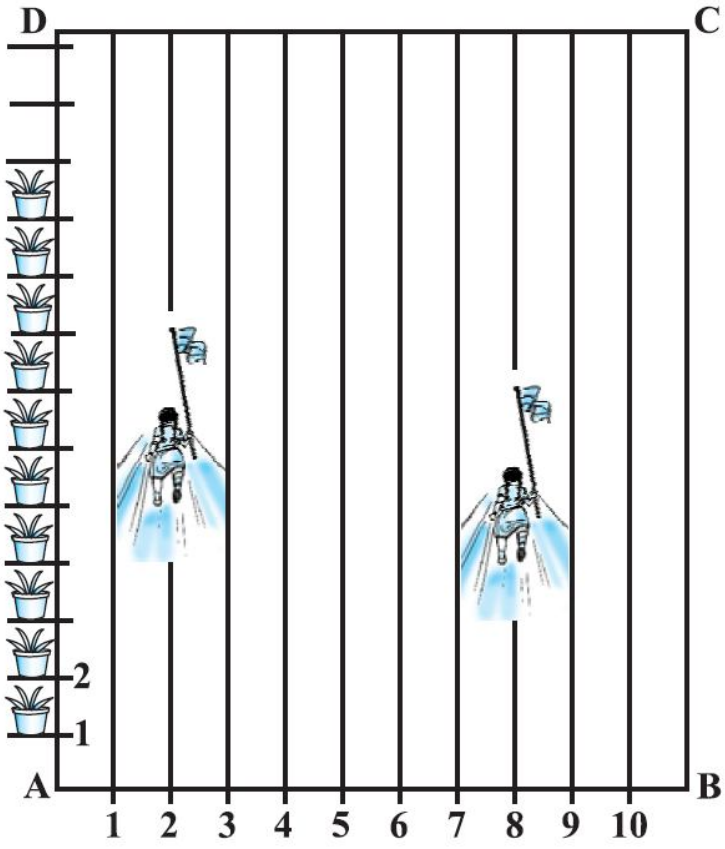
28. Find the zeroes of the quadratic polynomial $6x^2 - 7x - 3$ and verify the relationship between the zeroes and the coefficients of the polynomial.

29. Given a linear equation 3x – 5y = 1 form another linear equation in these variables such that the geometric representation of pair so formed is: (i) intersecting lines (ii) coincident lines (iii) parallel lines

30. 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 belo figure. Niharika runs 1/4th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5 th the distance AD on the eighth line and posts a red flag.

(i) What is the distance between both the flags?

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



31. Prove that: $\frac{\sin\theta - \cos\theta + 1}{\sin\theta + \cos\theta - 1} = \sec\theta + \tan\theta$

OR

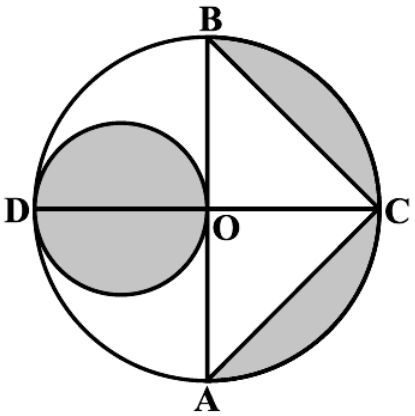
Prove that: $\left(\frac{1+\tan^2 A}{1+\cot^2 A}\right) = \left(\frac{1-\tan A}{1-\cot A}\right)^2 = \tan^2 A$

32. Construct a triangle ABC with BC = 7 cm, $\angle B = 60°$ and AB = 6 cm. Construct another triangle whose sides are times the corresponding sides of ΔABC.

OR

Draw a line segment of length 10 cm and divide it in the ratio 3 : 5. Measure the two parts.

33. In the below figure , AB and CD are two diameters of a circle (with centre O) perpendicular to each other and OD is the diameter of the smaller circle. If OA = 7 cm, find the area of the shaded region.

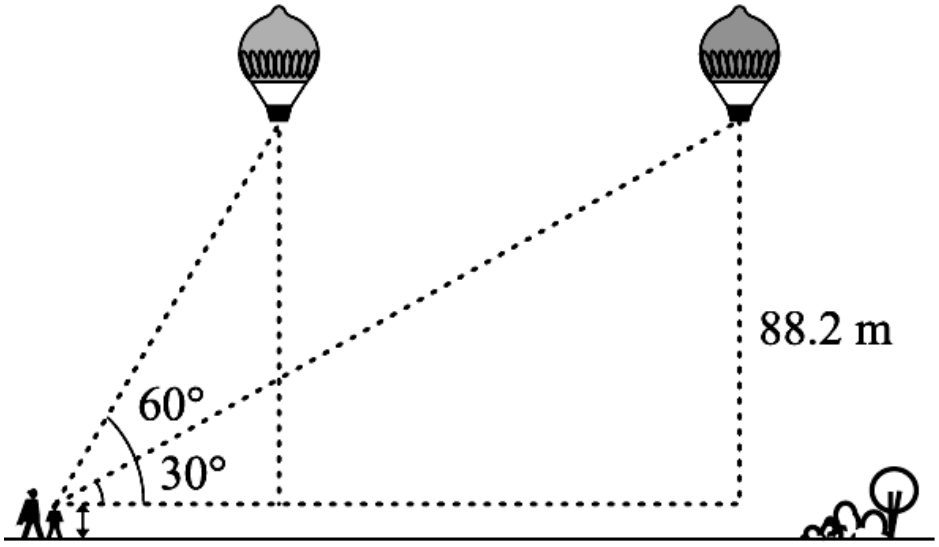


34. Prove that the intercept of a tangent between two parallel tangents to a circle subtends a right angle at the centre.

SECTION – D

Questions 35 to 40 carry 4 marks each.

35. A 1.2 m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2 m from the ground. The angle of elevation of the balloon from the eyes of the girl at any instant is 60°. After some time, the angle of elevation reduces to 30° (see the below figure). Find the distance travelled by the balloon during the interval.

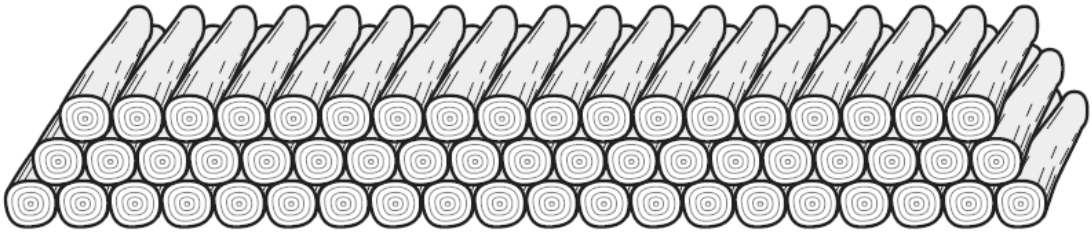


36. In a class test, the sum of Shefali's marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and 3 marks less in English, the product of their marks would have been 210. Find her marks in the two subjects.

37. Show that $a_1, a_2, \ldots, a_n, \ldots$ form an AP where an is defined as $a_n = 9 - 5n$. Also find the sum of the first 15 terms in each case.

OR

200 logs are stacked in the following manner: 20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on (see the below figure). In how may rows are the 200 logs placed and how many logs are in the top row?



38. Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

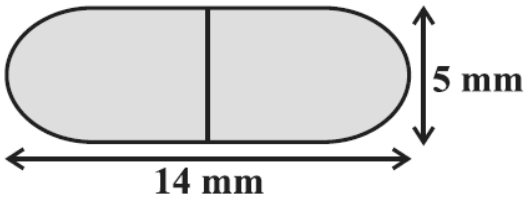
OR

State and prove Basic proportionality theorem.

39. 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. (Take $\pi = 3.14$)

OR

A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends (see the below figure). The length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.



40. The following table gives the heights (in meters) of 360 trees:

Height (in m)	Less than 7	Less than 14	Less than 21	Less than 28	Less than 35	Less than 42	Less than 49	Less than 56
No. of trees	25	45	95	140	235	275	320	360

From the above data, draw an ogive and find the median