KENDRIYA VIDYALAYA GACHIBOWLI, GPRA CAMPUS, HYD–32

SAMPLE PAPER 01 (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 01 (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

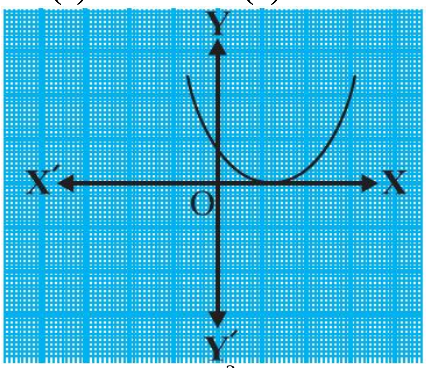
Questions 1 to 20 carry 1 mark each.

1. The decimal expansion of $\frac{63}{72\times175}$ is
(a) terminating (b) non-terminating
(c) non termination and repeating (d) an irrational number

2. If HCF and LCM of two numbers are 4 and 9696, then the product of the two numbers is:
(a) 9696 (b) 24242 (c) 38784 (d) 4848

3. $\left(2+\sqrt{3}+\sqrt{5}\right)$ is :
(a) a rational number (b) a natural number (c) a integer number (d) an irrational number

4. The number of zeroes of the polynomial from the graph is
(a) 0 (b) 1 (c) 2 (d) 3



5. If one of the zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is
(a) 10 (b) –10 (c) 5 (d) –5

6. If the origin is the mid-point of the line segment joined by the points (2,3) and (x,y), then the value of (x,y) is
(a) (2, –3) (b) (2, 3) (c) (–2, 3) (d) (–2, –3)

7. The distance of the point P(2, 3) from the x-axis is:
(a) 2 (b) 3 (c) 1 (d) 5

8. Find the length of tangent drawn to a circle with radius 7 cm from a point 25 cm away from the centre.

(a) 24 cm (b) 27 cm (c) 26 cm (d) 25 cm

9. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting a king of red colour

(a) $\frac{1}{26}$ (b) $\frac{2}{13}$ (c) $\frac{1}{13}$ (d) $\frac{3}{26}$

10. The abscissa of the point of intersection of the less than type and of the more than type ogives gives its

(a) mean (b) median (c) mode (d) all three

11. The coordinates of the point on y-axis which is nearest to the point (–2, 5) is _______

12. The value of $9\sec^2 A - 9\tan^2 A$ is ______

13. If $\cos A = \frac{24}{25}$, then the value of sinA is ______

14. The values of k for quadratic equation $2x^2 + kx + 3 = 0$, so that they have two equal roots is _____

OR

The value of k for which the system of equations 2x + 3y = 5 and 4x + ky = 10 has infinite many solution is _______

15. If $\sin A = \frac{1}{2}$, find the value of $\frac{2\sec A}{1+\tan^2 A}$.

OR

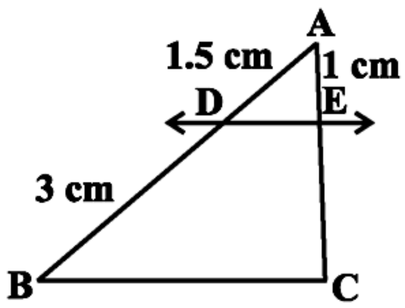
If $\sin\theta = \cos\theta$, then find the value of $2\tan\theta + \cos^2\theta$

16. ABC and BDE are two equilateral triangles such that $BD = \frac{2}{3}BC$. Find the ratio of the areas of triangles ABC and BDE.

17. The radii of two circles are 19 cm and 9 cm respectively. Find the radius of the circle which has circumference equal to the sum of the circumferences of the two circles.

18. If P(E) = 0.05, what is the probability of 'not E'?

19. In the given fig DE || BC then find the value of EC



20. Which term of the AP: 3, 8, 13, 18 ,…. is 78?

SECTION – B

Questions 21 to 26 carry 2 marks each.

21. A box contains cards numbered 11 to 123. A card is drawn at random from the box. Find the probability that the number on the drawn card is (i) a square number (ii) a multiple of 7

OR

A bag contains 3 red balls and 5 black balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is (i) red ? (ii) not red?

22. A die is thrown once. Find the probability of getting (i) a prime number; (ii) a number lying between 2 and 6;

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

24. If tan 2A = cot (A – 18°), where 2A is an acute angle, find the value of A.

OR

If $\sin(A - B) = \frac{1}{2}$, $\cos(A + B) = \frac{1}{2}$, $0° < A + B \leq 90°$, A > B, find A and B.

25. Find a quadratic polynomial, whose zeroes are – 3 and 2.

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

SECTION – C

Questions 27 to 34 carry 3 marks each.

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

OR

In a morning walk, three persons step off together. Their steps measure 80 cm, 85 cm and 90 cm respectively. What is the minimum distance each should walk so that all can cover the same distance in complete steps?

28. Find the zeroes of the quadratic polynomial $x^2 - 2x - 8$, and verify the relationship between the zeroes and the coefficients.

29. Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of '*m*' for which $y = mx + 3$.

30. Prove that: $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$

OR

Prove that: $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$.

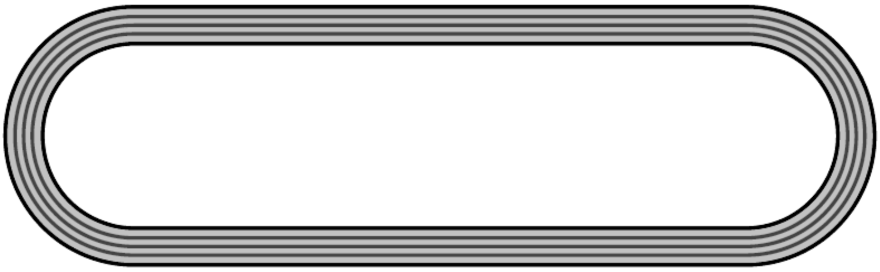
31. Draw a circle of radius 3 cm. Take two points P and Q on one of its extended diameter each at a distance of 7 cm from its centre. Draw tangents to the circle from these two points P and Q.

OR

Draw a line segment of length 7.6 cm and divide it in the ratio 5 : 8. Measure the two parts.

32. Prove that the parallelogram circumscribing a circle is a rhombus.

33. The below figure depicts a racing track whose left and right ends are semicircular.

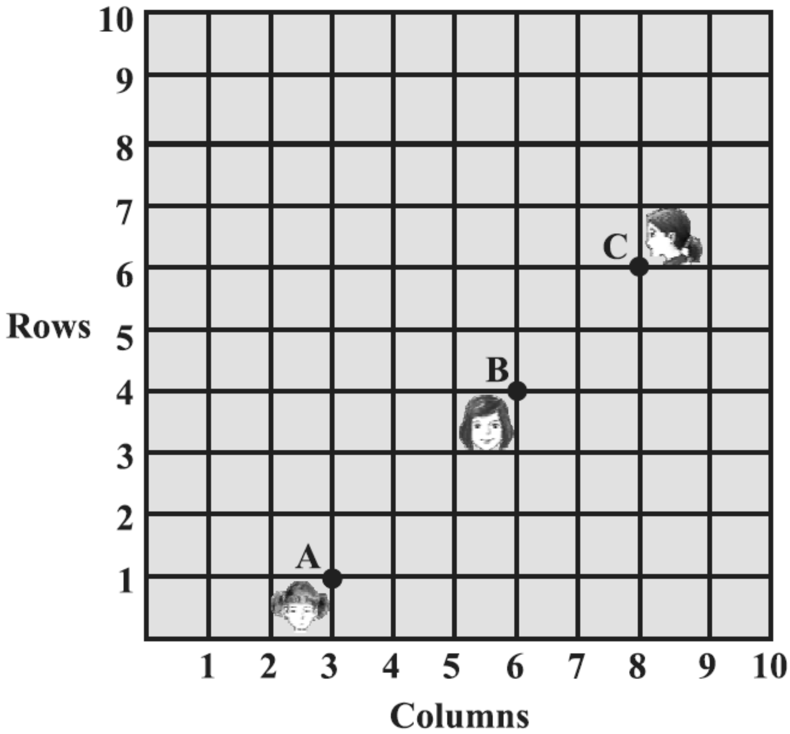


The distance between the two inner parallel line segments is 60 m and they are each 106 m long. If the track is 10 m wide, find :

(i) the distance around the track along its inner edge

(ii) the area of the track.

34. The below figure shows the arrangement of desks in a classroom. Ashima, Bharti and Camella are seated at A(3, 1), B(6, 4) and C(8, 6) respectively. Do you think they are seated in a line? Give reasons for your answer.



SECTION – D

Questions 35 to 40 carry 4 marks each.

35. From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45°. Determine the height of the tower.

36. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

37. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first n terms.

OR

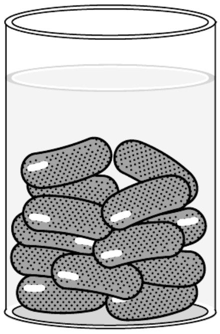
How many terms of the AP : 24, 21, 18, . . . must be taken so that their sum is 78?

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 gulab jamun, contains sugar syrup up to about 30% of its volume. Find approximately how much syrup would be found in 45 gulab jamuns, each shaped like a cylinder with two hemispherical ends with length 5 cm and diameter 2.8 cm (see below figure).



OR

A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.

40. Draw more than ogive for the following frequency distribution:

Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Number of students	5	8	6	10	6	6

Also find the median from the graph.