

KENDRIYA VIDYALAYA GACHIBOWLI , GPRA CAMPUS HYD - 32
SAMPLE TEST PAPER 02 FOR CLASS X (2020-21)

Max. marks: 80

Time Allowed: 3 hrs

General Instruction:

1. This question paper contains two parts A and B.
2. Both Part A and Part B have internal choices.

Part – A:

1. It consists three sections- I and II.
2. Section I has 16 questions of 1 mark each.
3. Section II has 4 questions on case study. Each case study has 5 case-based sub-parts. An examinee is to attempt any 4 out of 5 sub-parts.

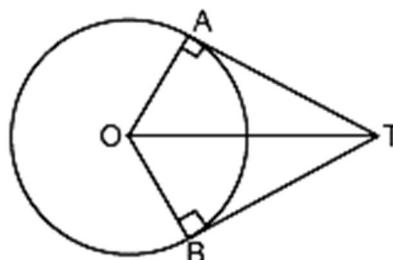
Part – B:

1. Question No 21 to 26 are Very short answer Type questions of 2 mark each,
2. Question No 27 to 33 are Short Answer Type questions of 3 marks each
3. Question No 34 to 36 are Long Answer Type questions of 5 marks each.

PART - A
SECTION-I

Questions 1 to 16 carry 1 mark each.

1. Find the value of k so that the following system of equations has no solution: $3x - y - 5 = 0$, $6x - 2y + k = 0$
2. Find the number of solutions of the following pair of linear equations:
 $x + 2y - 8 = 0$
 $2x + 4y = 16$
3. Find the ratio between the LCM and HCF of 5, 15, 20.
4. If the product of the zeroes of $x^2 - 3kx + 2k^2 - 1$ is 7, then find the values of k .
5. For what value of k , are the roots of the quadratic equation $3x^2 + 2kx + 27 = 0$ real and equal.
6. Write the nature of roots of quadratic equation $4x^2 + 4\sqrt{3}x + 3 = 0$.
7. Two APs have the same common difference. The first term of one of these is -1 and that of the other is -8 . Then find the difference between their 4th terms.
8. If $\sec A = 15/7$ and $A + B = 90^\circ$, find the value of $\operatorname{cosec} B$.
9. A point P is 26 cm from the centre of the circle. The length of the tangent drawn from P to the circle is 24 cm. Find the radius of the circle.
10. In figure if $\angle ATO = 40^\circ$, find $\angle AOB$.



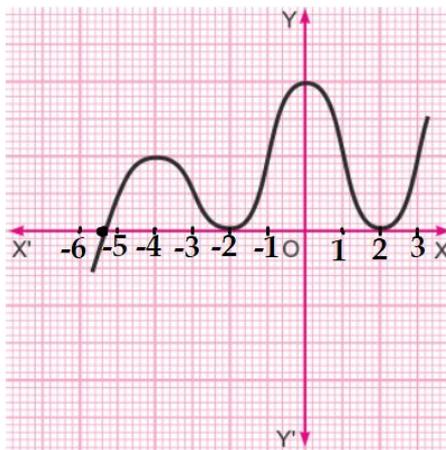
11. To divide a line segment PQ in the ratio 5 : 7, first a ray PX is drawn so that $\angle QPX$ is an acute angle and then at equal distances points are marked on the ray PX and the last point is joined to Q. Write the minimum number of these equal distances points on ray PX.
12. If $\cot \theta = 7/8$ evaluate $\frac{(1 + \sin \theta)(1 - \sin \theta)}{(1 + \cos \theta)(1 - \cos \theta)}$
13. ABC and BDE are two equilateral triangles such that D is mid-point of BC. Find the ratio of the areas of triangles ABC and BDE
14. What is the perimeter of a sector of angle 45° of a circle with radius 7 cm?
15. If the lateral surface area of a cylinder is 94.2 cm^2 and its height is 5 cm, then find radius of its base. [$\pi = 3.14$]
16. The letters of the word SOCIETY are placed at random in a row. Find the probability of getting a vowel.

SECTION-II

Case study based questions are compulsory. Attempt any four sub parts of each question. Each subpart carries 1 mark

17. Case Study based-1: Heavy Storm

One day, due to heavy storm an electric wire got bent as shown in the figure. It followed some mathematical shape of curve. Answer the following questions below.

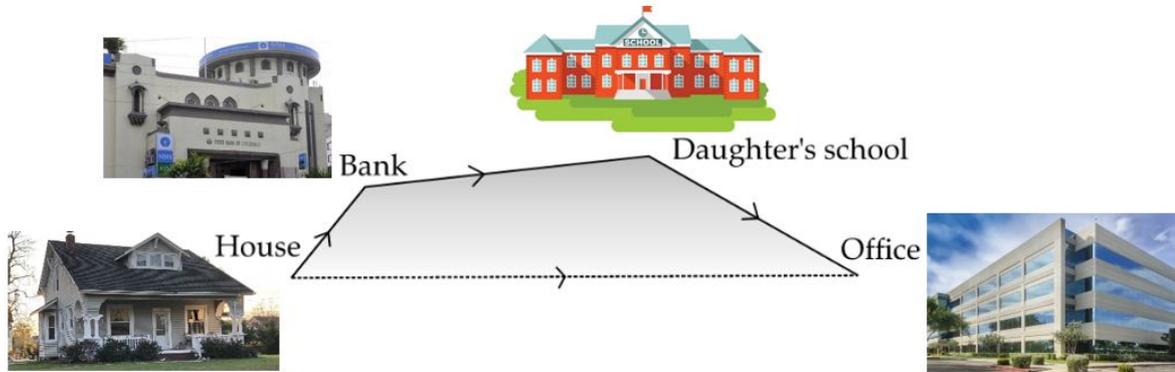


- (a) How many zeroes are there for the polynomial (shape of the wire)
 (i) 2 (ii) 3 (iii) 4 (iv) 5
- (b) Find the zeroes of the polynomial.
 (i) 2, 0, -2 (ii) 2, -2, -5 (iii) -2, 2, -5.5 (iv) None of these
- (c) Find the quadratic polynomial whose zeros are -3 and 4.
 (i) $x^2 + 4x + 2$ (ii) $x^2 - x - 12$
 (iii) $x^2 - 7x - 12$ (iv) None of these
- (d) Name the type of expression of the polynomial in the above graph?
 (i) quadratic (ii) cubic (iii) linear (iv) bi-quadratic

- (e) If one zero of the polynomial $x^2 - 5x - 6$ is -1 then find the other zero.
 (i) 6 (ii) -6 (iii) 2 (iv) -2

18. Case Study based-2:

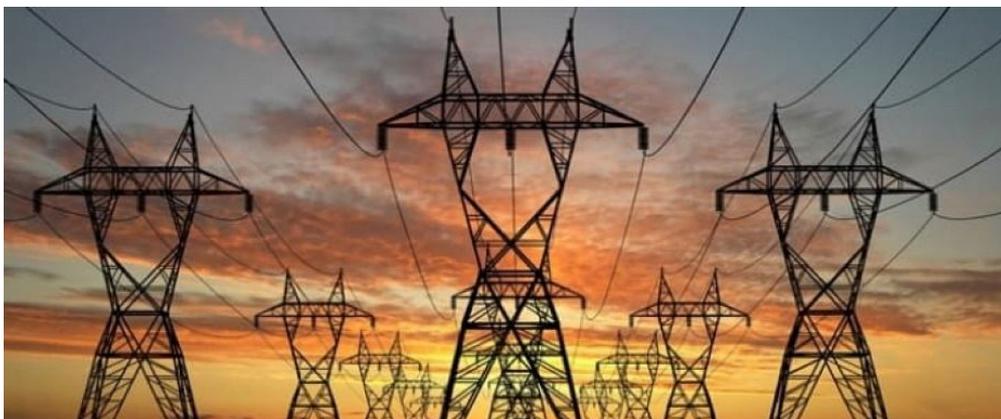
Aditya Starts walking from his house to office. Instead of going to the office directly, he goes to a bank first, from there to his daughter's school and then reaches the office. (Assume that all distances covered are in straight lines). If the house is situated at (2, 4), bank at (5, 8), school at (13, 14) and office at (13, 26) and coordinates are in km.



- (a) What is the distance between house and bank?
 (i) 5 (ii) 10 (iii) 12 (iv) 27
- (b) What is the distance between Daughter's School and bank?
 (i) 5 (ii) 10 (iii) 12 (iv) 27
- (c) What is the distance between house and office?
 (i) 24.6 (ii) 26.4 (iii) 24 (iv) 26
- (d) What is the total distance travelled by Aditya to reach the office?
 (i) 5 (ii) 10 (iii) 12 (iv) 27
- (e) What is the extra distance travelled by Aditya?
 (i) 2 (ii) 2.2 (iii) 2.4 (iv) none of these

19. Case Study based-3:

A group of students went to another city to collect the data of monthly consumptions (in units) to complete their Statistics project. They prepare the following frequency distribution table from the collected data gives the monthly consumers of a locality.

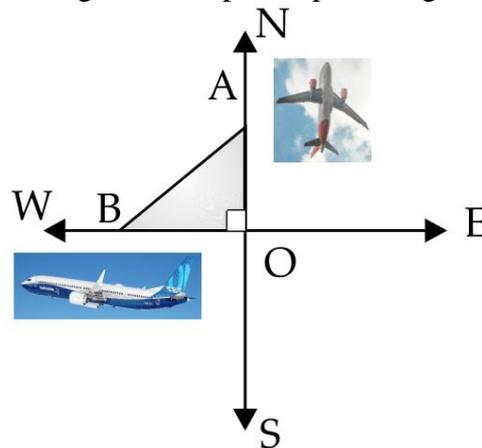


Monthly consumption (in units)	No. of consumers
65 - 85	4
85 - 105	5
105 - 125	13
125 - 145	20
145 - 165	14
165 - 185	8
185 - 205	4

- (a) What is the lower limit of median class?
(i) 125 (ii) 145 (iii) 165 (iv) 185
- (b) What is the lower limit of modal class?
(i) 125 (ii) 145 (iii) 165 (iv) 185
- (c) What is the mean of upper limits of median and modal class?
(i) 125 (ii) 145 (iii) 165 (iv) 185
- (d) What is the width of the class?
(i) 10 (ii) 15 (iii) 20 (iv) 25
- (e) The median is :
(i) 137 (ii) 135 (iii) 125 (iv) 135.7

20. Case Study based-4:

Mohan went to Airport two and half hours before his departure time. He observes that an aeroplane leaves an airport and flies due north at a speed of 1,000 km per hour. At the same time, he observes another aeroplane leaves the same airport and flies due west at a speed of 1,200 km per hour. After the departure of the two aeroplanes, now he is rough sketch of drawing the four directions along with aeroplanes pictures given below:



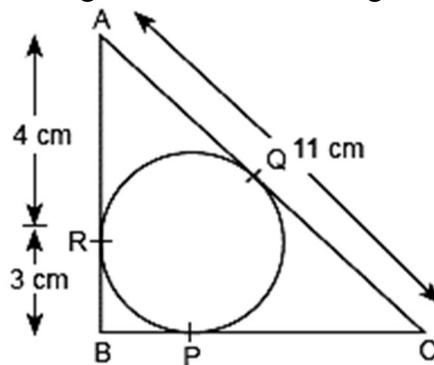
- (a) What is the distance travelled by aeroplane towards north after 1 ½ hours?
(i) 1000 km (ii) 1200 km (iii) 1500 km (iv) 1800 km
- (b) What is the distance travelled by aeroplane towards west after 1 ½ hours?
(i) 1000 km (ii) 1200 km (iii) 1500 km (iv) 1800 km
- (c) $\angle AOB$ is
(i) 90° (ii) 45° (iii) 30° (iv) 60°
- (d) How far apart will be the two planes after 1½ hours?
(i) $\sqrt{22,50,000}$ (ii) $\sqrt{32,40,000}$ (iii) $\sqrt{54,90,000}$ (iv) none of these

- (e) The given problem is based on which concept?
 (i) Triangles (ii) Co-ordinate geometry (iii) Height and Distance (iv) None of these

PART – B

(Question No 21 to 26 are Very short answer Type questions of 2 mark each)

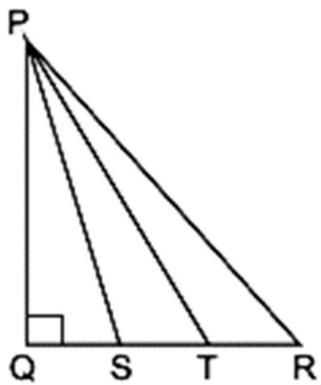
21. 4 Bells toll together at 9.00 am. They toll after 7, 8, 11 and 12 seconds respectively. How many times will they toll together again in the next 3 hours?
22. If C is a point lying on the line segment AB joining A(1, 1) and B(2, -3) such that $3AC = CB$, then find the coordinates of C.
23. ABC is a right triangle, right angled at C. If $A = 30^\circ$ and $AB = 40$ units, find the remaining two sides of $\triangle ABC$.
24. In figure, $\triangle ABC$ is circumscribing a circle. Find the length of BC.



25. Draw a pair of tangents to a circle of radius 4 cm which are inclined to each other at an angle of 45° .
26. In an AP, the 24th term is twice the 10th term. Prove that the 36th term is twice the 16th term.

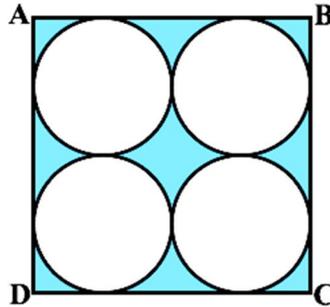
(Question no 27 to 33 are Short Answer Type questions of 3 marks each)

27. Prove that $\sqrt{7}$ is an irrational number.
28. In figure, S and T trisect the side QR of a right triangle PQR. Prove that $8PT^2 = 3PR^2 + 5PS^2$.



29. From the top of a tower 50 m high the angles of depression of the top and bottom of a pole are observed to be 45° and 60° respectively. Find the height of the pole.
30. Using quadratic formula, solve the following quadratic equation for x:
 $p^2x^2 + (p^2 - q^2)x - q^2 = 0$.

31. Find the area of the shaded region in the fig., where ABCD is a square of side 14 cm.



32. If the median of the distribution given below is 28.5, find the values of x and y.

Class	0-10	10-20	20-30	30-40	40-50	50-60	Total
Frequency	5	x	20	15	y	5	60

33. In a single throw of a pair of different dice, what is the probability of getting (i) a prime number on each dice (ii) a total of 9 or 11?

(Question no 34 to 36 are Long Answer Type questions of 5 marks each.)

34. Solve the following equations:

$$\frac{6}{x+2y} + \frac{5}{x-2y} = -3; \frac{3}{x+2y} + \frac{7}{x-2y} = -6; x+2y \neq 0, x-2y \neq 0.$$

35. A cylindrical vessel with internal diameter 10 cm and height 10.5 cm is full of water. A solid cone of base diameter 7 cm and height 6 cm is completely immersed in water. Find the volume of (i) water displaced out of the cylindrical vessel. (ii) water left in the cylindrical vessel.
36. A parachutist is descending vertically and makes angles of depression of 45° and 60° at two observation points 100 m apart from each other on the left side of himself. Find, in metres, the approximate height from which he falls and also find, in metres the approximate distance of the point where he falls on the ground from the first observation point.

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