AKASH MODEL SR. SEC. SCHOOL

STUDY MATERIAL

Term - I

Class - X

Subject - Maths

SAMPLE QUESTION PAPER-1 (TERM 1) 2021-22

SUBJECT : MATHEMATICS (BASIC)

CLASS : X

Time : 90 Min | Marks : 40

Since it is objective type paper and marking is given in Instruction, so marks need not to be given with questions.

General Instructions:

1. ***The question paper contains three parts A, B and C.***
2. ***Section A consists of 20 questions of 1 mark each. Attempt any 16 questions.***
3. ***Section B consists of 20 questions of 1 mark each. Attempt any 16 questions.***
4. ***Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.***
5. ***There is no negative marking.***

SECTION A

Section A consists of 20 questions. Any 16 questions are to be attempted

1. The record of a weather station shows that out of the past 250 consecutive days, its weather forecasts were correct 175 times. What is the probability that on a given day it was correct?

   (a) 0.3 (b) 0.7

   (c) 1 (d) 0

2. In a circle of diameter 20 cm , if an arc subtends an angle of 90° at the Centre where π=3.14 ,then the area of the minor sector is

(a) 78.5 cm (b) 157 cm

(c) 314 cm (d) NONE OF THE ABOVE

3. If $\sin \theta = 5/13$, then $\cot \theta$ is

(a) 13/12 (b) 5/12

(c) 12/5 (d) 13/5

4. The pair of linear equations $2m + 5n = 32$ and $4m + 10n = -64$ has

(a) One solution (b) Two solutions

(c) Infinitely many solutions (d) No solution

5. Two dice are thrown once. The probability of getting a sum of 8 is

(a) 0 (b) 1/36 (c) 5/36 d) 7/36

6. 4 apples and 5 bananas cost Rs 130, while 3 apples and 2 bananas cost Rs 80. The cost of one apple will be

(a) Rs. 10 (b) Rs. 60

(c) Rs. 20 (d) Rs. 30

7. If $\cot \theta + \tan \theta = 2$, the value of $\cot^2\theta + \tan^2\theta$ is

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

8. The decimal representation of 17/108 will be

(a) Terminating

(b) Non-terminating

(c) Non-terminating and repeating

(d) Non-terminating and non-repeating

9. The HCF of 135 and 225 is

(a) 45 (b) 15 (c) 75 (d) 25

10. The HCF of two numbers is 24 and their LCM is 288. If one number is 72, find the other number.

(a) 48 (b) 60

(c) 72 (d) 96

11. A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.

(a) 1.6 m (b) 1.8 m

(c) 3.2 m (d) 6.4 m

12. Two points A (1,3) and B (4,-6) are given. Find the distance of AB using distance formula.

(a) 9 units (b) $9\sqrt{10}$ units

(c) $12\sqrt{10}$ units (d) $3\sqrt{10}$ units

13. There is a circular path around a sports field. Raghav takes 18 minutes to drive one round of the field, while Geet takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point?

(a) 21 (b) 35

(c) 17 (d) 36

14. In a right angled triangle ABC, right angled at B. If AB=5 cm and AC=10 cm then find the measurement of angle C.

(a) 30° (b) 45°

(c) 75° (d) 60°

15. If in the equation $x + 2y = 10$, the value of y is 6, then the value of x will be

(a) -2 (b) 2

(c) 4 (d) 5

16. In a right angled triangle ABC, right angled at B. If AB= 24 cm and AC= 26 cm, then find BC.

(a) 25 (b) 12 (c) 10 (d) 5

17. If -2 is a zero of the polynomial $p(x) = x^2 - 6x - 16$, then the other zero is

(a) -8 (b) -7 (c) 1 (d) 8

18. Which of the following can be the probability of an event?

(a) – 0.4 (b) 1.004

(c) 5/4 (d) 0.095

19. Point P divides the line segment joining the points A(2, -5) and B(5, 2) in the ratio 2:3. Find the coordinates of P.

(a) (16/5 , - 11/5) (b) (6/5 , - 11/5)

(c) (16/5 , - 1/5) (d) (16/5 , 11/5)

20. The decimal expansion of 7/128 will terminate after how many places of decimals?

(a) 7 (b) 6 (c) 5 (d) 4

SECTION B

Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

21. The perimeter of a semicircular protractor whose radius is ' 7 cm' is

(a) 48 cm (b) 36 cm

(c) 54 cm (d) 77 cm

22. The probability of getting a spade card from a well shuffled deck of 52 cards is

(a) 1/52 (b) 2/13

(c) 1/4 (d) ½

23 In ABC, DE || AB. If AD = 3 cm, DB = 4 cm, AE = 6 cm, then EC is equal to

(a) 7.5 cm (b) 8 cm

(c) 4.5 cm (d) 6 cm

24 Radha has only ₹1 and ₹2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is ₹ 75, then the number of ₹1 and ₹2 coins are, respectively

(a) 35 and 15 (b) 15 and 35

(c) 35 and 20 (d) 25 and 25

25 . If the circumference of a circle is numerically equal to the area of circle , then find the radius of the circle.

(a) 2 units (b) 1 units

(c) 3 units (d) 4 units

26. Ratios of sides of a right triangle with respect to its acute angles are known as

(a) trigonometric identities

(b) trigonometry

(c) trigonometric ratios of the angles

(d) none of these

27. If $x \tan 45° \sin 30° = \cos 30° \tan 30°$, then x is equal to

(a) $\sqrt{3}$ (b) 12 (c) $12\sqrt{2}$ (d) 1

28. A horse is tied to a peg at one corner of a square shaped grass field of side 15 m by means of a 7 m long rope. The area of that part of the field in which the horse can graze, is

(a) 38.5 cm^2 (b) 77 cm^2 (c) 154 cm^2 (d) 314 cm^2

29. Express 98 as a product of its primes

(a) $2^2 \times 7$ (b) $2^2 \times 7^2$

(c) 2×7^2 (d) $2^3 \times 7$

30. Two alarm clocks ring their alarms at regular intervals of 50 seconds and 48 seconds. If they first beep together at 12

noon, at what time will they beep again for the first time ?

(a) 12.20 pm (b) 12.12 pm

(c) 12.11pm (d) none of these

31. **The father's age is six times his son's age. Four years after, the age of the father will be four times his son's age. The present ages of the son and the father are, respectively**

(a) 4 and 24 (b) 5 and 30

(c) 6 and 36 (d) 3 and 24

32. **The value of $\sin^2 30° - \cos^2 30°$ is**

(a) -1/2 (b) 1/4 (c) 1/6 (d) ½

33. **The sides of two similar triangles are in the ratio 2:3 .The ratio of their areas will be**

(a) 2:3 (b) 6:9 (c) 4:6 (d) 4:9

34. **The larger of two supplementary angles exceeds the smaller by 20°. Find the angles.**

(a) 100°, 80° (b) 10°, 80°

(c) 90°, 80° (d) 95°, 85°

35. In a rectangle Length = 8 cm, Breadth = 6 cm. Then its diagonal = ...

(a) 9 cm (b) 14 cm (c) 10 cm (d) 12 cm

36. **The lengths of the diagonals of a rhombus are 26 cm and 10 cm. Then, the length of the side of the rhombus is**

(a) 9 cm (b) 10 cm (c) 8 cm (d) 12 cm

37. **Three coins are tossed simultaneously. The probability of getting all heads is**

(a) 1/8 (b) 3/8 (c) 3/8 (d) 1/2

38. **The length of the minute hand of a clock is 14 cm. The area swept by the minute hand in 5 minutes is**

(a) 153.9 cm^2 (b) 102.6 cm^2

(c) 51.3 cm^2 (d) 205.2 cm^2

39. If in triangles ABC and DEF , AB/DE = BC/EF , then they will be similar, if

(a) $\angle B = \angle E$ (b) $\angle A = \angle D$

(c) $\angle B = \angle D$ (d) $\angle A = \angle F$

40. The pair of equation $x = -4$ and $y = -5$ graphically represents lines which are

(a) intersecting at (- 5, – 4) (b) intersecting at (- 4, – 5)

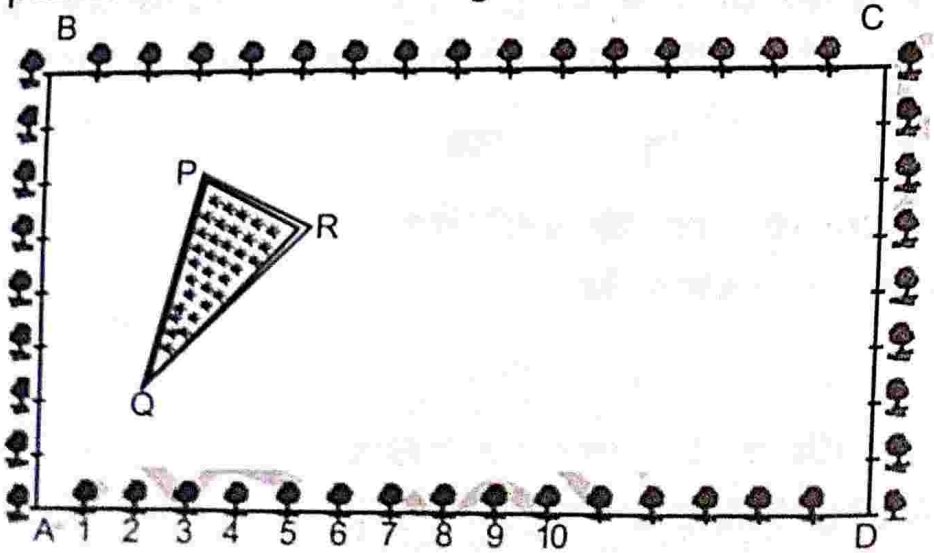
(c) intersecting at (5, 4) (d) intersecting at (4, 5)

SECTION C:

Case study based questions. Section C consists of 10 questions of 1 mark each. Any 8 questions are to be attempted.

Case Study 1:

The Class X students of a secondary school in Krishinagar have been allotted a rectangular plot of land for their gardening activity. Sapling of Gulmohar are planted on the boundary at a distance of 1m from each other. There is a triangular grassy lawn in the plot as shown in the Fig. The students are to sow seeds of flowering plants on the remaining area of the plot.



41. **Taking A as origin, find the coordinates of the vertices of the triangle.**

(a) P(4,6), Q(3,2), R(6,5) (b) P(5,6), Q(2,3), R(6,6)

(c) P(3,6), Q(4,3), R(5,6) (d) P(3,6), Q(3,1), R(5,5)

42. **Find the distance of PQ.**

(a) 4 units (b) 5 units (c) 6 units (d) $\sqrt{17}$ units

43. **Find the distance of QR.**

(a) $3\sqrt{2}$ units (b) $2\sqrt{3}$ units (c) 6 units (d) $\sqrt{7}$ units

44. **Find the mid point of line segment PR.**

(a) (5, 5) (b) (5.5, 5) (c) (5, 5.5) (d) (5, 6)

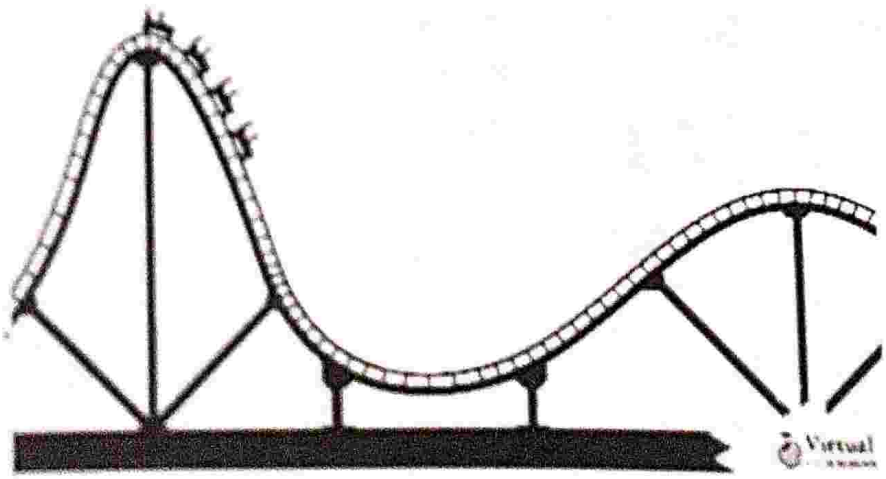
45. **Find the mid point of line segment.**

(a) (5, 5) b) (5.5, 5) (c) (4.5, 3.5) (d) (5, 6)

CASE STUDY 2:

ROLLER COASTER POLYNOMIALS: Polynomials are everywhere. They play a key role in the study of algebra, in analysis and on the whole many mathematical problems involving them. Since, polynomials are used to describe curves of various types. Engineers use polynomials to graph the curves of roller coasters.

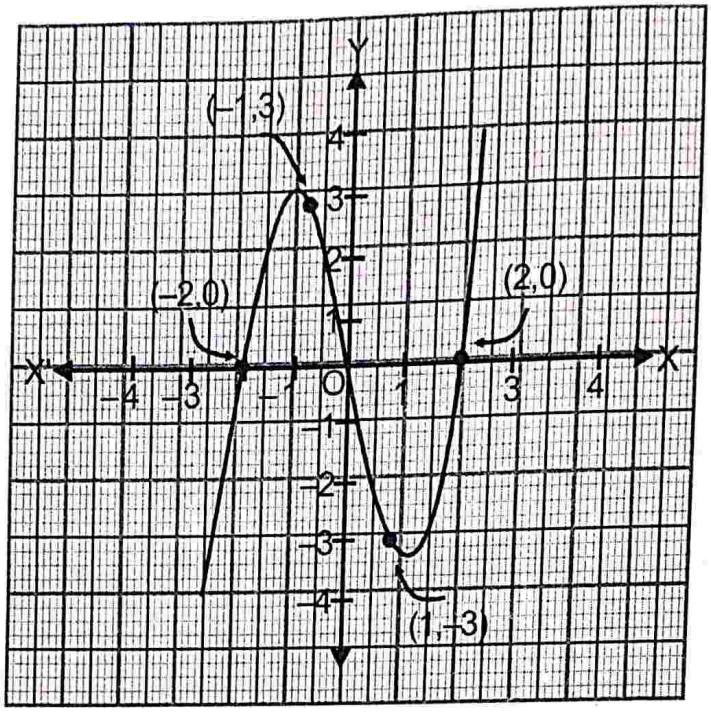
46. If the Roller Coaster is represented by the following graph y=p(x), then name the type of the polynomial it traces



(a) elipse (b) parabola

(c) hyperbola (d) circle

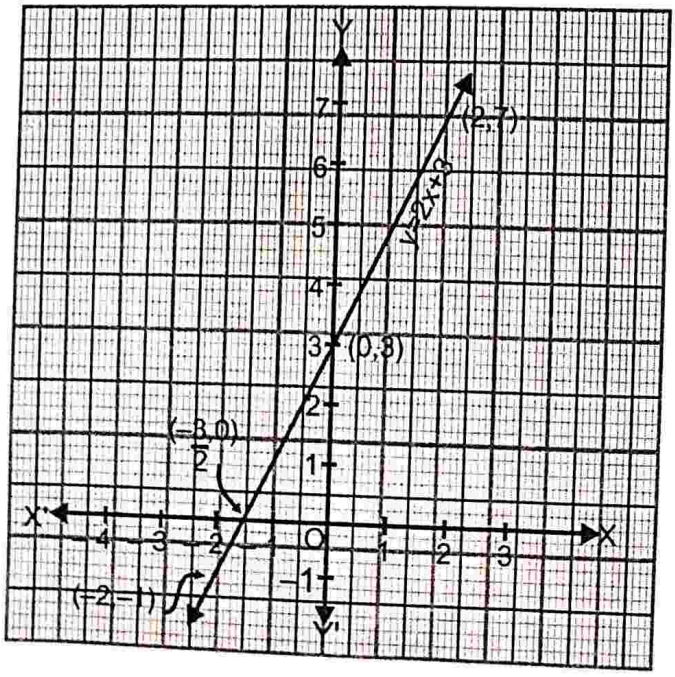
47. Find the number of zeros of the given polynomial y = p(x)



(a) 0 (b) 1

(c) 2 (d) 3

48. Name the type of graph y=p(x).



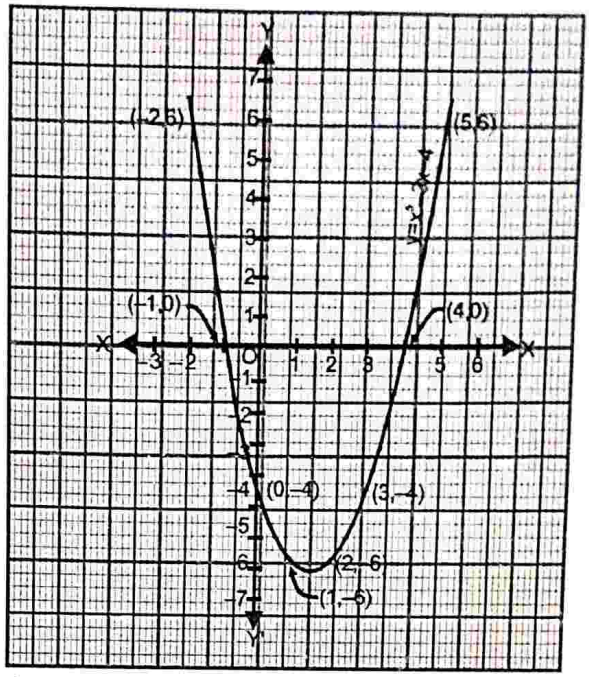
(a) linear polynomial (b) quadratic polynomial

(c) cubic polynomial (d) none of the above

49. Find the zero of the polynomial y=p(x).

(a) - 1 and 4 (b) - 1 and - 4

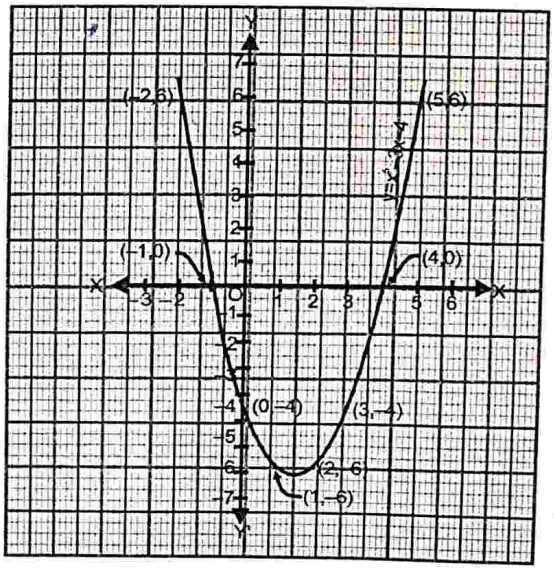
(c) 1 and- 4 (d) -4 and 3



50. Find the equation of the given quadratic polynomial y=p(x).

(a) x^2 - 3x + 4 (b) x^2 + 3x – 4

(c) x^2 - 3x - 4 (d) x^2 - 6x + 4



SAMPLE QUESTION PAPER-1 (TERM 1) 2021-22

SUBJECT : MATHEMATICS (STANDARD)

CLASS : X

Time : 90 Min **Marks : 40:**

General Instructions:

1. ***The question paper contains three parts A, B and C.***
2. ***Section A consists of 20 questions of 1 mark each. Attempt any 16 questions.***
3. ***Section B consists of 20 questions of 1 mark each. Attempt any 16 questions.***
4. ***Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.***
5. ***There is no negative marking.***

SECTION A

Section A consists of 20 questions. Any 16 questions are to be attempted

1. **Find the probability that a leap year has 53 Tuesdays.**

(a) 1/7 (b) 2/7

(c) 1/53 (d) 1/366

2. In a circle of diameter 14 cm , if an arc subtends an angle of **90° at the centre where π =22/7 ,then the area of the minor segment is**

(a) 7 cm^2

(b) 14 cm^2

(c) 4 cm^2

(d) NONE OF THE ABOVE

3. **If $\sin\theta = 3/4$, then $\text{cosec}^2\theta - \cot^2\theta$ is**

(a) 13/2 (b) 5/12

(c) 0 (d) 1

4. Solve: $2m - 5n = 9$ and $4m + n = 7$

(a) $m=2, n=-3$ (b) $m=2, n=-1$

(c) $m=2, n=1$ (d) $m=-2, n=-1$

5. **Two dice are thrown once. The probability of getting a sum of at least 9 is**

(a) 0 (b) 1/36

(c) 5/18 (d) 7/36

6. **The value of k, for which the system of equations**

$x + (k + 1)y = 5$ and

$(k + 1)x + 9y = 8k - 1$

has infinitely many solutions is:

(a) 2 (b) 3

(c) 4 (d) 5

7. If ΔABC is right angled at C, then the value of $\cos(A + B)$ is:

(a) -1 (b) 0

(c) 1 (d) 2

8. The decimal representation of 7/6250 is:

(a) 0.00112 (b) 0.0112

(c) 0.112 (d) 11.2

9. The LCM of smallest odd prime number and smallest odd composite number is:

(a) 9 (b) 15

(c) 75 (d) 25

10. **The largest number which divides 60 and 75, leaving remainders 8 and 10 respectively, is**

(a) 23 (b) 75

(c) 65 (d) 13

11. **A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.**

(a) 1.6 m (b) 1.8 m

(c) 3.2 m (d) 6.4 m

12. Two points A (1,y) and B (4,-2) are equidistant from point P(3,0). Find y.

(a) y=1 , y= -2 (b) y=2 , y= -1

(c) y=3 , y= -3 (d) y=1 , y= -1

13. **Three farmers have 490 kg, 588 kg and 882 kg of wheat respectively.**

Find the maximum capacity of a bag so that the wheat can be packed in exact number of bags.

(a) 98 kg (b) 290 kg

(c) 200 kg (d) 350 kg

14. If $3\cot\theta = 4$, then the value of $\sin\theta + \cos\theta$ is

(a) 5/7 (b) 7/5

(c) 3/5 (d) 2/5

15 The sum of the digits of a two-digit number is 9. If 27 is added to it, the digits of the number get reversed. The number is

(a) 27 (b) 72

(c) 45 (d) 36

16. Sides of two similar triangles are in the ratio 3 : 7. Areas of these triangles are in the ratio

(a) 9 : 35 (b) 9 : 49

(c) 49 : 9 (d) 9 : 42

17. The zeros of the polynomial $p(x) = x^2 - 6x - 16$, are

(a) -8 ,2 (b) -7 ,1

(c) 1 , 4 (d) 8 ,-2

18. A bag contains 3 red balls and 5 black balls. A ball is drawn at random from the bag. The probability that a red ball drawn is

(a) 3/8 (b) 5/8

(c) 3/5 (d) 5/3

19 The distance of the point (α, β) from the origin is

(a) $\alpha + \beta$

(b) $\sqrt{a^2 + B^2}$

(c) $|\alpha| + |\beta|$

(d) None of the above

20. The decimal form of 108/786 is

(a) terminating

(b) non-termining but repeating

(c) non-terminating non-repeating

(d) none of the above

SECTION B

Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

21. The perimeter of a semicircular protractor is 36 cm. Find its radius. (Use $\pi = 22/7$)

(a) 14 cm (b) 21 cm

(c) 28 cm (d) 7 cm

22. The probability of getting a red face card from a well shuffled deck of 52 cards is

(a) 1/52 (b) 2/13

(c) 1/4 (d) 3/26

23. In ABC, DE || AB. If AD = 6 cm, AB = 10 cm, AE = 9 cm, then AC is equal to

(a) 7.5 cm (b) 8 cm

(c) 15 cm (d) 6 cm

24. Radha has only ₹10 and ₹5 coins with her. If the total number of coins that she has is 16 and the amount of money with her is ₹130, then the number of ₹ 10 and ₹5 coins are, respectively

(a) 10 and 6 (b) 15 and 5

(c) 14 and 2 (d) 9 and 7

25. If the circumference of a circle is 88 cm. Find its area. **(Use $\pi = 22/7$)**

(a) 308 cm^2 (b) 314 cm^2

(c) 616 cm^2 (d) 157 cm^2

26. If $y \sin 45° \cos 45° = \tan^2 45° - \cos^2 30°$, then y is equal to

(a) –1 (b) 1/2

(c) -2 (d) 2

27. If $\sin\theta + \sin^2\theta = 1$, then $\cos^2\theta + \cos^4\theta$ is equal to

(a) -1 (b) 0

(c) 1 (d) 2

28. From a square of side 20 cm, largest circle is cut out. Find the area of the remaining sheet. . **(Use π =3.14)**

(a) 38.5 cm^2 (b) 77 cm^2

(c) 154 cm^2 (d) 86 cm^2

29. Express 196 as a product of its primes

(a) $2^2 \times 7^0$ (b) $2^2 \times 7^2$

(c) $2^3 \times 7^2$ (d) $2^3 \times 7^3$

30. Three alarm clocks ring their alarms at regular intervals of 60 seconds , 50 seconds and 48 seconds. If they first beep together at 12 noon, at what time will they beep again for the first time?

(a) 12:20 pm (b) 12:12 pm

(c) 12.:11pm (d) none of these

31. The pair of equations $3x - 5y = 7$ and $-6x + 10y = 7$ have

(a) a unique solution (b) infinitely many solutions

(c) no solution (d) two solutions

32. The value of $\sin^2 30° + \cos^2 30° - \tan^2 45°$ is

(a) 0 (b) 4

(c) 6 (d) 2

33. Sides of triangles are (i) 3 cm, 4 cm, 6 cm. (ii) 4 cm, 5 cm, 6 cm. (iii) 7 cm, 24 cm, 25 cm (iv) 5 cm, 12 cm, 14 cm. Which of these is right angled triangle?

(a) (i) (b) (ii)

(c) (iii) (d) (iv)

34 sum of two numbers is 20 and their difference is 4. Find the numbers.

(a) 14,6 (b) 12,8

(c) 15,5 (d) 13,7

35. In a rectangle Length is 24 cm, its diagonal is 26 cm.Find the breadth of the rectangle.

(a) 9 cm (b) 14 cm

(c) 10 cm (d) 12 cm

36. In $\triangle ABC$, D and E are points on sides AB and AC respectively such that DE || BC and AD : DB = 3 : 1. If EA = 6.6 cm then find AC.

(a) 8.8 cm (b) 2.2 cm

(c) 10 cm (d) 12 cm

37. Three coins are tossed simultaneously. The probability of getting atmost two heads is

(a) 1/8 (b) 3/8

(c) 7/8 (d) 1/2

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

(a) 35 cm

(b) 10 cm

(c) 21 cm

(d) 28 cm

39. If in triangles ABC and DEF , AB/DE = BC/EF , then they will be similar, if

(a) $\angle B = \angle E$

(b) $\angle A = \angle D$

(c) $\angle B = \angle D$

(d) $\angle A = \angle F$

40. The pair of equations x = a and y = b graphically represents lines which are

(a) parallel

(b) intersecting at (b, a)

(c) coincident

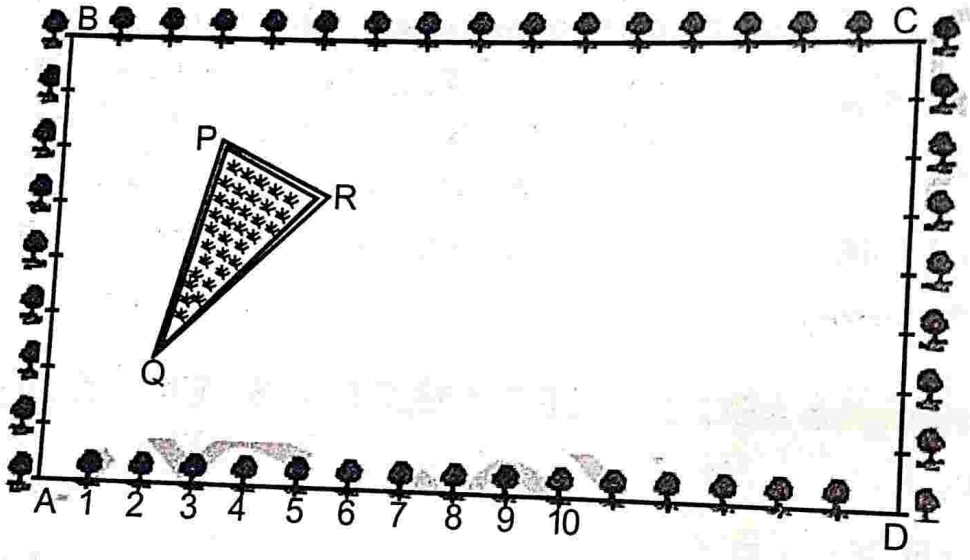
(d) intersecting at (a, b)

SECTION C

Case study based questions. Section C consists of 10 questions of 1 mark each. Any 8 questions are to be attempted.

Case Study 1:

The Class X students of a secondary school in Krishinagar have been allotted a rectangular plot of land for their gardening activity. Sapling of Gulmohar are planted on the boundary at a distance of 1m from each other. There is a triangular grassy lawn in the plot as shown in the Fig. The students are to sow seeds of flowering plants on the remaining area of the plot.



41. Taking A as origin, find the coordinates of the vertices of the triangle.

(a). P(4,6), Q(3,2), R(6,5)

(b). P(5,6), Q(2,3), R(6,6)

(c). P(3,6), Q(4,3), R(5,6)

(d). P(3,6), Q(3,1), R(5,5)

42. Find the distance of PQ.

(a). 4 units

(b). 5 units

(c). 6 units

(d). $\sqrt{17}$ units

43. Find the farthest point of the rectangle from point Q.

(a) A (b) B

(c) C (d) D

44. Find the mid point of line segment PR.

(a) (5, 5) (b) (5.5, 5)

(c) (5, 5.5) (d) (5, 6)

45. Find the area of rectangle ABCD

(a) 256 SQ. units (b) 64 SQ. units

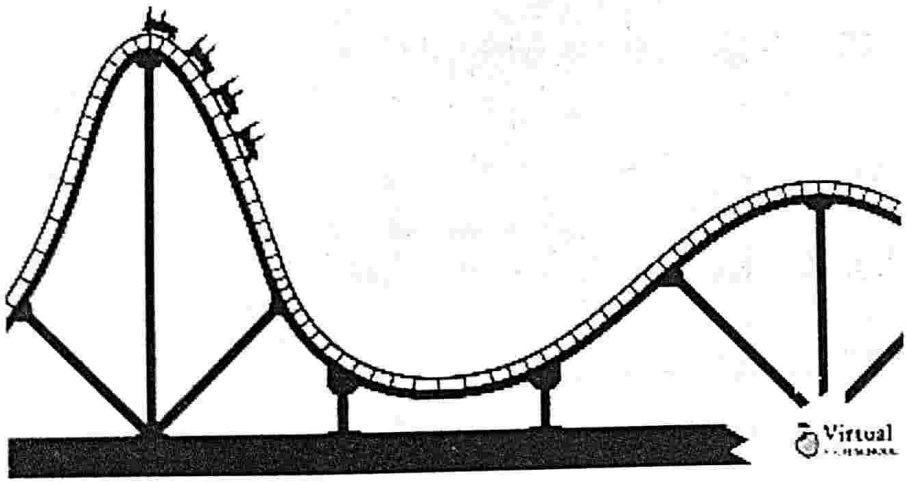
(c) 32 SQ. units (d) 128 SQ. units

CASE STUDY 2:

ROLLER COASTER POLYNOMIALS:

Polynomials are everywhere. They play a key role in the study of algebra, in analysis and on the whole many mathematical problems involving them. Since, polynomials are used to describe curves of various types. Engineers use polynomials to graph the curves of roller coasters.

46. If the Roller Coaster is represented by the following graph y=p(x), then name the type of the polynomial it traces.



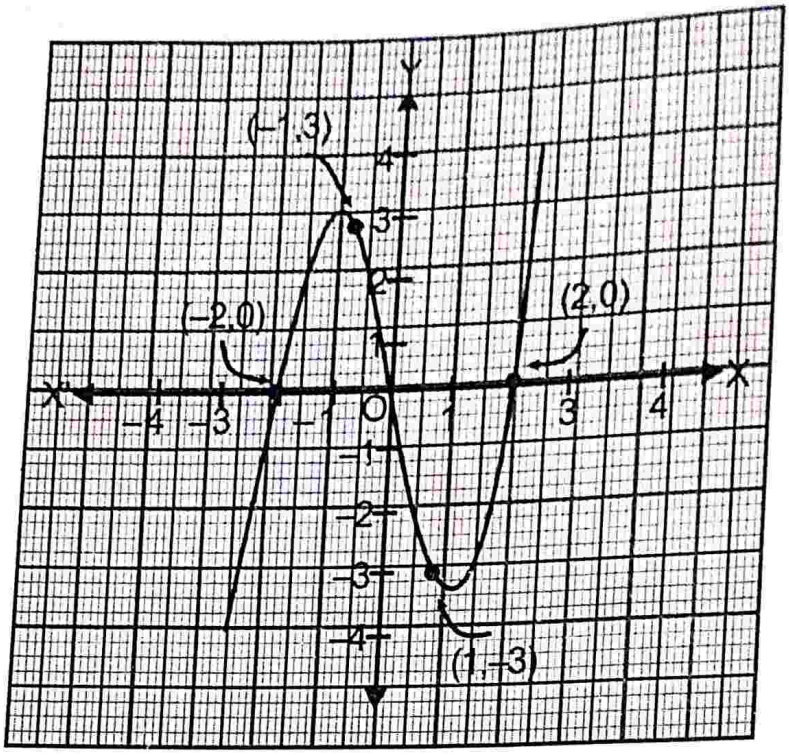
(a) ellipse (b) parabola

(c) hyperbola (d) circle

47. Find the zeros of the given polynomial y = p(x)

(a) 0 , 1, 2 (b) 1 ,0 , -1

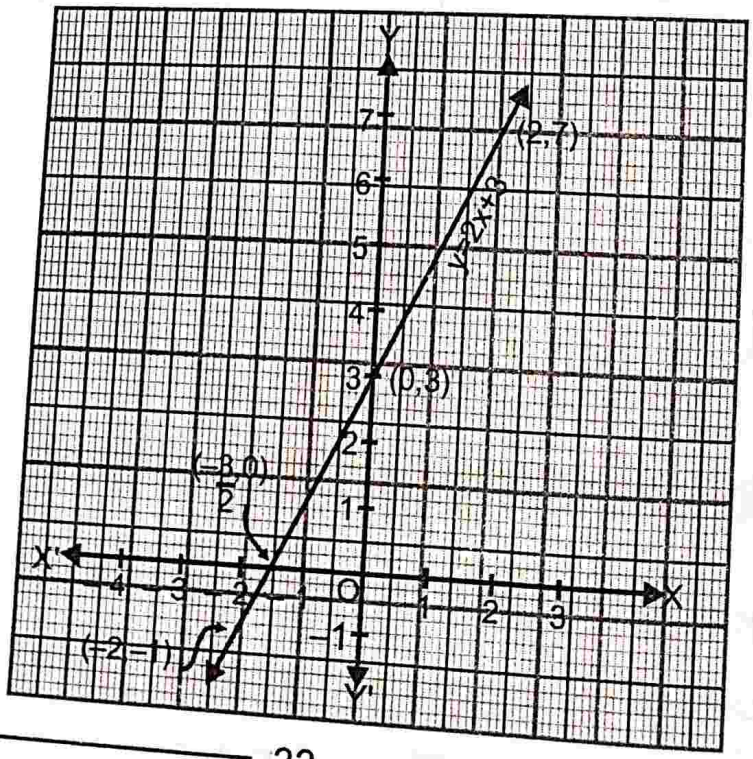
(c) -2 , 0 , 2 (d) 3 , 2, 1



48. Name the type of graph y=p(x).

(a) linear polynomial (b) quadratic polynomial

(c) cubic polynomial (d) none of the above



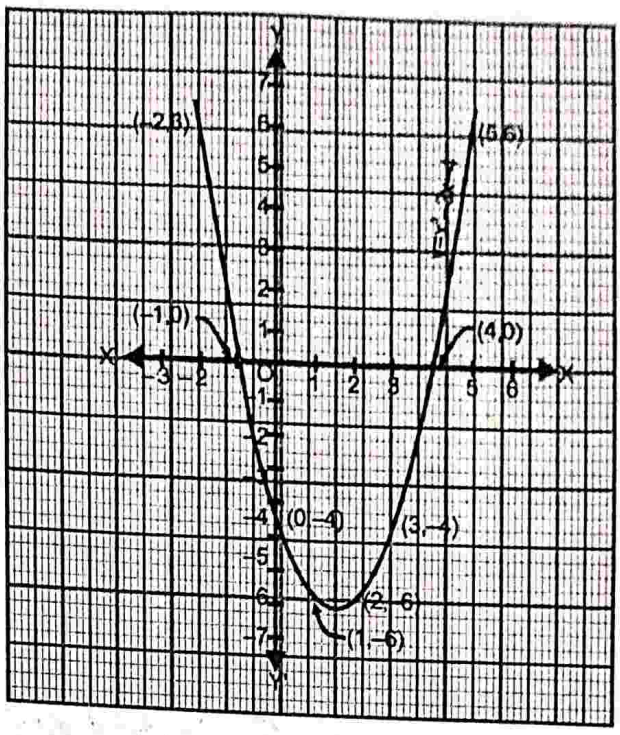
49. Find the Zeroes of the polynomial y=p(x).

(a) - 1 and 4

(b) - 1 and - 4

(c) 1 and- 4

(d) -4 and 3



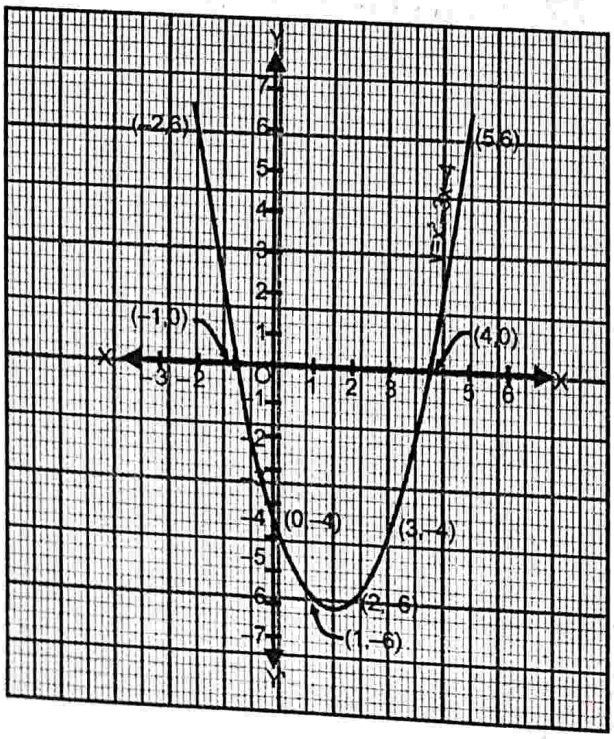
50. Find the equation of the given quadratic polynomial y=p(x).

(a) x^2 - 3x + 4

(b) x^2 + 3x - 4

(c) x^2 - 3x - 4

(d) x^2 - 6x + 4



SAMPLE QUESTION PAPER-2 (TERM 1) 2021-22

SUBJECT : MATHEMATICS(STANDARD)

CLASS : X

Time : 90 Min **Marks : 40:**

General Instructions:

1. The question paper contains three parts A, B and C
2. Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted
3. Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted
4. Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.
5. There is no negative marking.

SECTION A

Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted

1. HCF (306, 657) = 9, what will be the LCM (306, 657) ? 1

(a) 12338 (b) 22338

(c) 23388 (d) 22388

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

(a) a = -7, b = -1 (b) a = 5, b = -1

(c) a = 2, b = -6 (d) a = 0, b = -6

3 Graphically, the pair of equations 6x – 3y + 10 = 0 and 2x – y + 9 = 0 represents two lines which are 1

(a) Intersecting at exactly one point

(b) Intersecting at two points

(c) Coincident

(d) Parallel

4 Which of the following statement is true? 1

(a) All isosceles triangles are similar.

(b) All quadrilateral are similar.

(c) All circles are similar.

(d) None of the above

5 If in two ΔABC and DEF, $AB/DF = BC/FE = CA/ED$, then 1

(a) $\Delta ABC \sim \Delta DEF$ (b) $\Delta ABC \sim \Delta EDF$

(c) $\Delta ABC \sim \Delta EFD$ (d) $\Delta ABC \sim \Delta DFE$

6 If ΔABC is right angled at C, then the value of $\sec(A + B)$ is 1

(a) 0 (b) 1

(c) $2/\sqrt{3}$ (d) not defined

7 **Area of a sector of a circle of radius R, whose central angle is P (in degrees) is given by:** 1

A . $(P/180) \times 2\pi R$ B. $(P/360) \times \pi^2$

C. $(P/180) \times 2\pi^2$ D. $(P/360) \times 2\pi$

8 Express 98 as a product of its primes 1

(a) $2^2 \times 7$ (b) $2^2 \times 7^2$ (c) 2×7^2 (d) 2×7

9 If the zeroes of the quadratic polynomial $Ax^2 + Bx + C$, $C \neq 0$ are equal, then 1

(a) A and B have the same sign

(b) A and C have the same sign

(c) B and C have the same sign

(d) A and C have opposite signs

10 If $x = a$, $y = b$ is the solution of the equations $x + y = 5$ and $2x - 3y = 4$, then the values of a and b are respectively 1

(a) 6, -1 (b) 2, 3

(c) 1, 4 (d) 19/5, 6/5

11 In a right-angled triangle ABC, angle C = 35 degree and in another right-angled triangle PQR angle R = 35 degree. Then relation between the two triangles is: 1

(a) Congruent. (b) Equal.

(c) Similar. (d) No relation

12 If $\sin\theta + \cos\theta = \sqrt{}\cos\theta$, $(\theta \neq 90)$ then the value of $\tan\theta$ is 1

(a) $\sqrt{}2 - 1$ (b) $\sqrt{}2 + 1$

(c) $\sqrt{}2$ (d) $-\sqrt{}2$

13 $\sin^2 60^0 - 2\tan 45^0 - \cos^2 30^0 = ?$ 1

(a) 2 (b) –2 (c) 1 (d) –1

14 The circumference of two circles are in the ratio 2:3. The ratio of their areas is:- 1

a) 2:3 b) 4:9

c) 9:4 d) none of these

15 A square is inscribed in a circle of radius r. Find the area of the square in sq.units 1

a) $3r^2$ b) $2r^2$

c) $4r^2$ d) none of these

16 If two positive integers A and B can be expressed as $A = xy^3$ and $B = x^4y^2z$; x, y being prime numbers, the LCM (A, B) is 1

(a) xy^2 (b) $x^4\ y^2z$

(c) $x^4\ y^3$ (d) $x^4\ y^3\ z$

17 The graph of $y = 5$ is a line parallel to the 1

(a) x-axis (b) y-axis

(c) both axis (d) none of these

18 In a triangle if the square of its longest side is equal to the sum of squares of other two sides, then it is a right-angled triangle. This statement is called: 1

(a) Pythagoras Theorem.

(b) Converse of the Pythagoras Theorem.

(c) Thales Theorem.

(d) Converse of Thales Theorem.

19 A road which is 7 m wide surrounds a circular park whose circumference is 352 m. Find the area of the road. 1

a) 2618 m^2 b) 2518 m^2

c) 1618 m^2 d) none of these

20 Ashmita and Shreya are sisters, what is the probability that both having same birthday. (ignoring leap year) 1

(a) 1/30 (b) 2/ 365

(c) 1/ 366 (d) 1/ 365

SECTION B

Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted

21 The least number that is divisible by all the numbers from 1 to 5 (both inclusive) is 1

(a) 5 (b) 60

(c) 20 (d) 100

22 The value of k, for which the system of equations $x + (k + 1)y = 5$ and $(k + 1)x + 9y = 8k - 1$ has infinitely many solutions is 1

(a) 2 (b) 3

(c) 4 (d) 5

23 The pair of equations $x = 4$ and $y = 3$ graphically represents lines which are 1

(a) parallel

(b) intersecting at (3, 4)

(c) coincident

(d) intersecting at (4, 3)

24 If the distance between the points (x, -1) and (3, 2) is 5, then the value of x is 1

(a) -7 or -1

(b) -7 or 1

(c) 7 or 1

(d) 7 or -1

25 If in triangles ABC and DEF, AB/DE = BC/EF then they will be similar, when 1

(a) $\angle B = \angle E$

(b) $\angle A = \angle D$

(c) $\angle B = \angle D$

(d) $\angle A = \angle F$

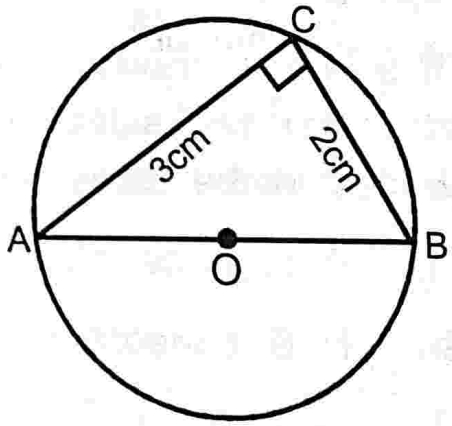
26 In the given figure, AOB is a diameter of a circle with centre O. The value of tanA. tanB will be 1

(a) 1

(b) 2

(c) $\sqrt{3}$

(d) 3



27 The perimeter of a sector of a circle of radius 5.6 cm is 27.2 cm. Find the area of the sector. 1

a) 44 cm^2

b) 44.6 cm^2

c) 44.8 cm^2

d) none of these

28 If P(E) is 0.75 . what is P(not E)? 1

(a) 0.35

(b) 0.25

(c) 0

(d) 1

29 In a throw of a pair of dice , the probability of getting a doublet is: 1

(a) 1 /3 (b) 1/ 6 (c) 5/ 12 (d) 2/ 3

30 The ratio between the LCM and HCF of 5, 15, 20 is: 1

(a) 9:1 (b) 4:3

(c) 11:1 (d) 12:1

31 The line $3x + y - 9 = 0$ divides the line joining the points (1, 3) and (2, 7) internally in the ratio 1

(a) 3 : 4 (b) 3 : 2

(c) 2 : 3 (d) 4 : 3

32 D and E are respectively the points on the sides AB and AC of a triangle ABC such that AD = 2 cm, BD = 3 cm, BC = 7.5 cm and DE || BC. Then, length of DE (in cm) is: 1

(a) 2.5 cm (b) 3 cm

(c) 5 cm (d) 6 cm

33 "If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio." This theorem is known as : 1

(a) Pythagoras Theorem

(b) Thales theorem

c) converse of Thales Theorem

(d) Converse of Pythagoras theorem.

34 $\tan^4 \theta + \tan^2 \theta = ?$ 1

(a) $\sec^2 \theta - 2 \sec^4 \theta$ (b) $2 \sec^2 \theta - \sec^4 \theta$

(c) $\sec^2 \theta - \sec^4 \theta$ (d) $\sec^4 \theta - \sec^2 \theta$

35 If $\tan(A + B) = \sqrt{3}$ and $\tan(A - B) = \frac{1}{\sqrt{3}}$, A > B , then the value of A is 1

(a) 45° (b) 60° (c) 90° (d) 30°

36 The area of the square is the same as the area of the circle. Their perimeter are in the ratio:- 1

a) 1:1 b) π:2 c) 2:$\sqrt{\pi}$ d) none of these

37 Find the LCM of smallest prime and smallest odd composite natural number. 1

(a) 6 (b) 10 (c) 14 (d) 18

38 The father's age is six times of his son's age. Four years after, the age of the father will be four times of his son's age. The present ages, in years, of the son and the father are, respectively.

(a) 4 and 24 (b) 5 and 30 1

(c) 6 and 36 (d) 3 and 18

39 The coordinates of the centroid of a triangle whose vertices are (0, 6), (8,12) and (8, 0) is: 1

(a) (4, 6) (b) (16, 6)

(c) (8, 6) (d) (16/3, 6)

40 If two coins are tossed simultaneously, then the probability of getting at least one head is : 1

(a) 1 /4 (b) 3/ 4 (c) 1/ 2 (d) 1

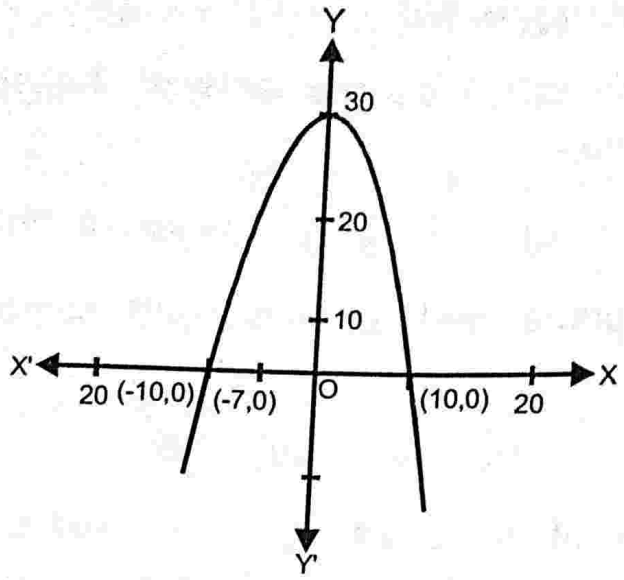
SECTION C

Case study based questions: Section C consists of 10 questions of 1 mark each. Any 8 questions are to be attempted

Q41-Q45 are based on Case Study -1

Case Study -1

Two friends Aryan and Om decided to go for a trekking. During summer vacation, they went to Panchmarhi. While trekking they observed that the trekking path is in the shape of a parabola. The mathematical representation of the track is shown in the graph.



Based on the above information, answer the following questions.

41 The zeroes of the polynomial whose graph is given are 1

(a) 4,7 (b) –4, 7

(c) 4, 3 (d) –7, 10

42 What will be the expression of the given polynomial p(x)? 1

(a) $x^2 - 3x - 70$ (b) $-x^2 + 4x - 28$

(c) $x^2 + 4y - 28$ (d) $-x^2 + 3x + 28$

43 Product of the zeroes of the polynomial which represents the parabola is 1

(a) –28 (b) –70 (c) 28 (d) 30

44 In the standard form of quadratic polynomial, $ax^2 + bx + c$, a, b, and c are 1

(a) All are real numbers

(b) All are rational numbers

(c) a is a non zero real number, b and c are any real numbers

(d) All are integer

45 If the sum of the roots is -p and product of the roots is – 1/P, then the quadratic polynomial is

(a) $-x^2 + \frac{1}{p}x + 1$ (b) $x^2 - \frac{1}{p}x - 1$

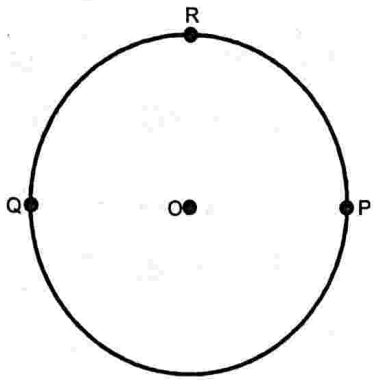
(c) $x^2 + px - 1/p$ (d) $x^2 - px + 1/p$

Q46-Q50 are based on Case Study -2

Case Study -2

In a city, a circular park is situated with centre O(3 , 3). There are two exit gates P and Q which are opposite to each other.

The location of exit gate 'P' is (5 , 3)



46 The location of exit gate 'Q' will be:- 1

(a) (3 , 1) (b) (3 , 3)

(c) (1 , 3) (d) (5 , 3)

47 What will be the distance between two exit gates P and Q? 1

(a) 3 units b) 4 units (c) 5 units (d) 6 units

48 If a pole R(x , 5) is standing on a boundary of circular park which is equidistant from P and Q then, the value of 'x' will be 1

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

49 In what ratio does the centre O (3 , 3) divides the line segment joining the points P and Q? 1

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

50 Distance QR is equal to : 1

(a) 2 units (b) $2\sqrt{2}$ units

(c) 4 units (d) $4\sqrt{2}$ units

SAMPLE QUESTION PAPER-3 (TERM 1) 2021-22

SUBJECT : MATHEMATICS (BASIC)

CLASS : X

Time : 90 Min **Marks : 40:**

General Instructions:

1. The question paper contains three parts A, B and C.
2. Section A consists of 20 questions of 1 mark each. Attempt any 16 questions.
3. Section B consists of 20 questions of 1 mark each. Attempt any 16 questions.
4. Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.
5. There is no negative marking.

SECTION A

Section A consists of 20 questions. Any 16 questions are to be attempted

1 A card is drawn from a well shuffled deck of 52 playing cards. The probability of getting a red face card is 1

a) $\frac{12}{13}$ c) $\frac{3}{26}$

b) $\frac{3}{13}$ d) $\frac{4}{52}$

2 The maximum value of $\frac{1}{\cos ec\,\theta}$ is

a) 0 c) $\frac{1}{2}$

b) 1

d) $\frac{\sqrt{3}}{2}$

3 The radius of a circle is 50 cm , If the radius is decreased by 50%, Its area will be decreased by 1

a) 50%

c) 80%

b) 75%

d) 25%

4 The diameter of a wheel is 1.26 m . The distance travelled in 500 revolutions is 1

a) 2670 m

c) 1980 m

b) 2880 m

d) 1596 m

5 If the LCM of 12 and 42 is 10m+4 , then the value of 'm' is 1

a) 50

c) 10

b) 8

d) 1

6 The decimal expansion of number $\frac{441}{2^2 \times 5^3 \times 7}$ is 1

a) A terminating decimal

b) Non terminating but repeating

c) Non terminating non repeating

d) terminating after two places of decimal

7 108 can be expressed as product of its primes as 1

a) $2^3 \times 3^2$

c) $2^2 \times 3^3$

b) $2^3 \times 3^3$

d) $2^2 \times 3^2$

8 The area of the circle that can be inscribed in a square of side 6 cm is 1

a) $36\ \pi cm^2$

c) $12\ \pi cm^2$

b) $18\ \pi cm^2$

d) $9\ \pi cm^2$

9 The probability that a leap year should have 52 Tuesday is

a) $\frac{2}{7}$ c) $\frac{5}{7}$

b) $\frac{3}{7}$ d) $\frac{1}{7}$

10 Reena has only Rs 1 and Rs 2 with her. If the total number of coins that she has is 50 and the amount of money with her is Rs 75 , Then the number of Rs 1 and Rs 2 coins are respectively

a) 35,15 c) 15 , 35

b) 35,20 d) 25 , 25 1

11 If Sin A = cos A, Then value of 'A' is 1

a) 30° c) 60°

b) 45° d) 90°

12 The value of is $\sin^2 30° - \cos^2 30°$ 1

a) -1/2 c) 3/2

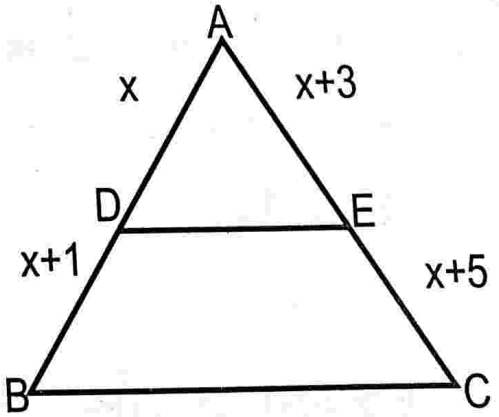
b) $\frac{\sqrt{3}}{2}$ d) 2/3

13 If the area of circle is 154cm^2, Then its perimeter is 1

a) 11 cm c) 44 cm

b) 22 cm d) 55 cm

14 In ΔABC , If DE II BC , Then the value of 'x' is



a) 2

c) 4

b) 3

d) 5

15 If the perimeter of two similar triangles ABC and PQR are 60 cm and 36 cm respectively and PQ=9 cm , Then AB= 1

a) 6 cm
c) 15 cm
b) 10 cm
d) 24 cm

16 The value of K for which the system of equations $x + y - 4 = 0$ and $2x + Ky = 3$ has no solution is 1

a) -2
c) 3
b) $\neq 2$
d) 2

17 One ticket is drawn at random from a bag containing tickets numbered 1 to 40 , the probability that the selected ticket has a number which is a multiple of 5 is 1

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

18 The pair of equations $x + 2y + 5 = 0$ and $3x + 6y + 1=0$ have

a) a unique solution
c) infinitely many solutions
b) exactly two solutions
d) no solution 1

19 The sum of the digits of a two digit number is 9 , If 27 is added to it , the digits of the number get reversed . The no. is

a) 25
c) 63
b) 72
d) 36 1

20 If $\tan(A+B)=\sqrt{3}$ & tan (A–B)$=\frac{1}{\sqrt{3}}, 0° < A+B \leq 90°, A > B$, Then the value of A + B is 1

a) 30°
c) 60°
b) 45°
d) 90°

SECTION B

Section B consists of 20 questions of 1 mark each. Any 16

questions are to be attempted

21 Three vertices of a parallelogram taken in order are (-1,-6), (2,-5) and (7,2). The fourth vertex is 1

a) (1,4)
c) (4,4)
b) (1,1)
d) (4,1)

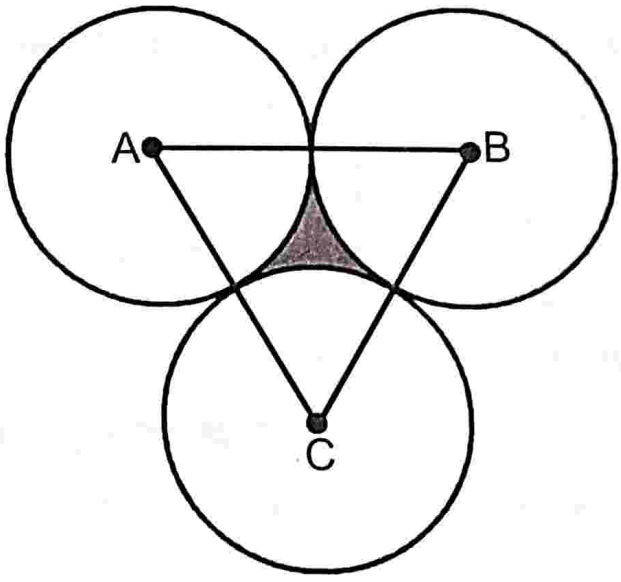
22 A coin is tossed twice . The probability of getting both heads is 1

a) 1/2
c) 1/4
b) 1/3
d) 1

23 If two positive integers p and q can be expressed as $p = ab^2$ and $q = a^3b$; Where a, b being prime numbers, then LCM (p, q) is equal to 1

a) ab
c) a^3b^2
b) a^2b^2
d) a^2b^3

24 ABC is an equilateral Δ. The area of the shaded region if the radius of each the circle is 1 cm is 1



a) $2 - \frac{\pi}{3}$
c) $\sqrt{3} - \frac{\pi}{2}$

b) $\sqrt{3}-\pi$ d) $\sqrt{3}-\frac{\pi}{4}$

25 The point P which divides the line segment joining the points A (2,-5) and (5,2) in the ratio 2 : 3 lies in the quadrant 1

a) I c) III

b) II d) IV

26 If $\Delta\ ABC$ is a right angled triangle at C, then value of cos (A+B)is 1

a) 0 c) 1/2

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

27 $\Delta\ ABC$ and $\Delta\ BDE$ are two equilateral triangles such that D is the mid point of BC. Ratio of the areas of $\Delta\ ABC$ and $\Delta\ BDE$ is 1

a) 2 : 1 c) 4 : 1

b) 1 : 2 d) 1 : 4

28 The father's age is 6 times his sons age. Four years after the age of father will be four times his sons age. The present age of the son and the father in years are respectively 1

a) 4 and 24 c) 6 and 36

b) 5 and 30 d) 3 and 24

29 If a pair of linear equations is consistent, then lines will be 1

a) parallel c) intersecting or coincident

b) always coincident d) Always intersecting

30 Sides of two similar triangles are in the ratio 4:9 . Area of these triangles are in the ratio

a) 2:3 1

c) 81:16

b) 4:9

d) 16:81

31 A die is thrown twice, The probability that 5 will not come up either time is 1

a) 11/36

b) 13/36

c) 25/36

d) 27/36

32 If 4 $\tan\theta$=3 Then $\left(\frac{4\sin\theta-\cos\theta}{4\sin\theta+\cos\theta}\right)$ is equal to 1

a) 2/3

b) 1/3

c) 1/2

d) 3/4

33 $\frac{1+\cot^2 A}{1+\tan^2 A}$ 1

(a) $\tan^2 A$

(b) $\text{cosec}^2 A-1$

(c) $\sec^2 A$

(d) $1-\sin^2 A$

34 The HCF of two numbers 'a' and 'b' is 5 and their LCM is 200. Then the product of 'a' and 'b' is 1

a) 205

b) 200

c) 1000

d) 195

35 The height of an equilateral triangle of side 'a' is 1

a) $\frac{a}{2}$

b) $\frac{a\sqrt{3}}{2}$

c) $a\sqrt{3}$

d) $\frac{a\sqrt{3}}{4}$

36 The decimal expansion of $\frac{189}{125}$ will terminate after

a) 1 place of decimal

b) 2 places of decimal

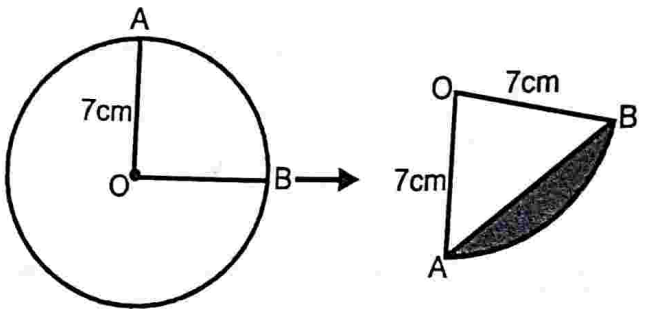
c) 3 places of decimal

d) 4 places of decimal

37 The length of the shadow of a 12 cm long vertical rod is 8 cm. At the same time , The length of the shadow of the tower is 40 cm, The height of the tower is

a) 60 m
c) 40 cm
b) 60 cm
d) 80 cm

38 Mitali is a student of art and craft. She folded a circular paper in a shape of quadrant as shown then cut the shaded portion from the quadrant . Then , the area of the shaded portion is 1



a) $49\ cm^2$
c) $\frac{7}{2}cm^2$
b) $\frac{49}{2}cm^2$
d) $14\ cm^2$

39 **The sum of numerator and the denominator of a fraction is 12. If the denominator is increased by 3 , The fraction becomes ½ . The fraction is** 1

a) 5/7
(c) 3/8
(b) 7/5
d) 8/3

40 7×11×13+13 is a 1

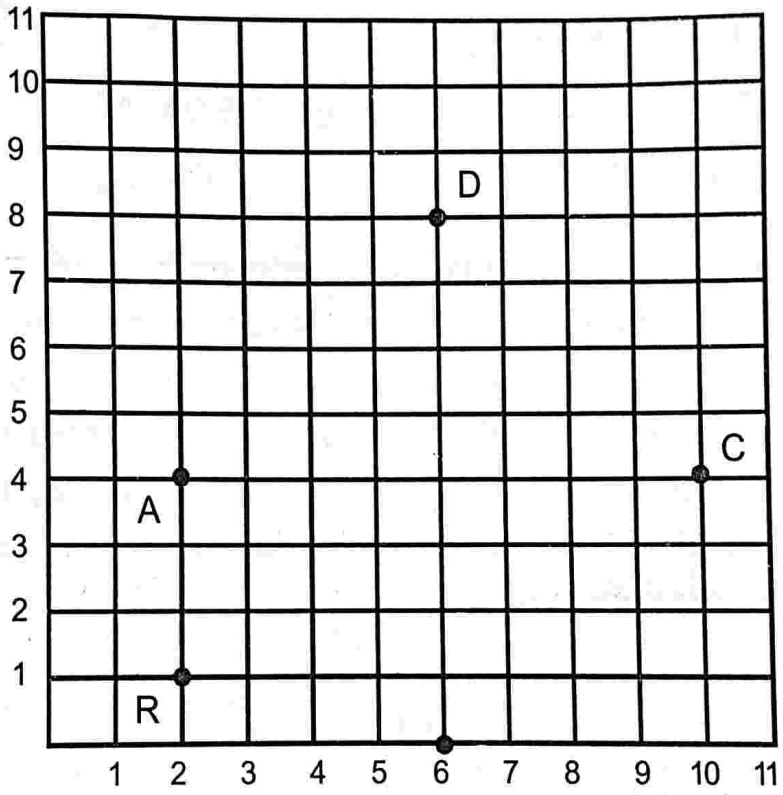
a) Prime
b) composite
c) neither prime nor composite
d) none

SECTION C

CASE STUDY BASED QUESTIONS

Section C consists of 10 questions of 1 mark each. Any 8 questions are to be attempted.

POSITION OF FLAGS for annual day practice students of a class arc standing In rows and columns. Four students Ashish, Bipin, Cintha and Damodar are holding flags. their position shown as in the figure



41 What are the coordinates of D? 1

a) (8, 6) c) (9,6)

b) (6,8) d) (6, 9)

42 What is the distance of A from D? 1

a) $3\sqrt{2}$ units c) 4 units

b) $4\sqrt{2}$ units d) 6 units

43 Ram is positioned at R. He moves from R and takes his position such that he is equidistant from A&C.What are the coordinates of Ram in its new position? 1

a) (4,6)
b) (5,6)
c) (6,4)
d) (6,5)

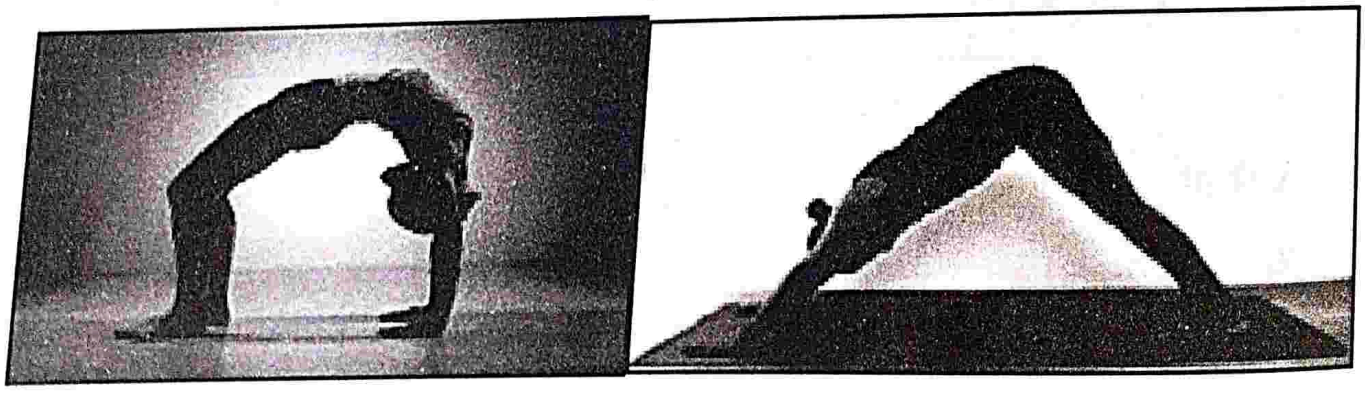
44 How much distance is covered by Ram to move to the new position ? 1

a) 5 units
b) 6 units
c) 7 units
d) 8 units

45 Which of the following is not true? 1

a) AB=BC
b) AB= AD
c) BD= AC
d) AC= BC

Q . An asana is a body posture, originally and still a general term for a sitting meditation pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position, adding reclining, standing, inverted, twisting, and balancing poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial. 1



46 The shape of the poses shown is 1

a) Spiral
b) Ellipse
c) Linear
d) Parabola

47 The graph of parabola open downwards , if 1

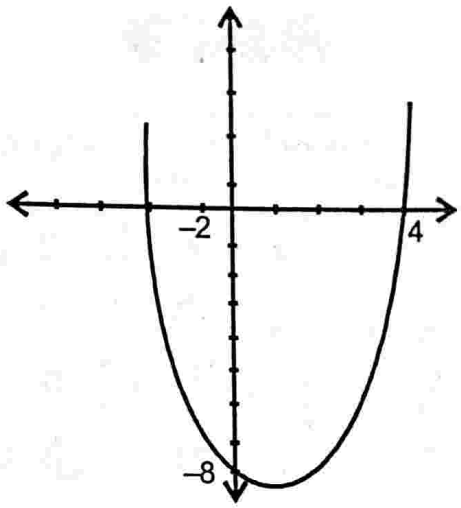
a) $a \geq 0$

b) $a=0$

c) $a<0$

d) $a > 0$

48 In the graph how many zeros are there for the polynomial? 1



a) 0

c) 2

b) 1

d) 3

49 The two zeroes in the above shown graph are 1

a) (2,4)

c) (-8,4)

b) (-2,4)

d) (2,-8)

50 The zeroes of the quadratic polynomial $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$ are

a) $2/\sqrt{3}$, $\sqrt{(3/4)}$

b) $\frac{-2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$

c) $2/\sqrt{3}$, $-\sqrt{3/4}$

d) $-2\sqrt{3}$, $-\sqrt{(3/4)}$ 1

SAMPLE QUESTION PAPER-3 (TERM 1) 2021-22

SUBJECT : MATHEMATICS (STANDARD)

CLASS : X

Time : 90 Min **Marks : 40:**

General Instructions:

1) ***The question paper contains three parts A B and C***
2) ***Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.***
3) ***Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.***
4) ***Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.***
4) ***There is no negative marking***

SECTION A

Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

1) The ratio between the LCM and HCF of 5 ,15, 20 is

a) 9:1 b) 4:3

c) 11:1 d) 12:1

2) The value of k for which the system of linear equations x+2y=3, 5x+ky+7=0 is inconsistent

a) -14/3 b) 2/5

c) 5 d) 10

3) A man goes 150m to east and then 200m to north .How far is he from the starting point?

a) 625m b) 250m

c) 150m d) 200

4) ABC is a right triangle ,right angled at C .If A=30° and AB = 40 units, find the remaining two sides of ΔABC

a) $30, 30\sqrt{3}$ b) $10, 10\sqrt{3}$

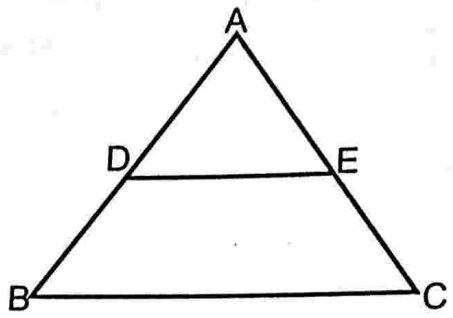
c) $20, 20\sqrt{3}$ d) 20,40

5) A die is thrown once. Find the probability of getting a prime number

A) 1/4 b) 1/6

c) 1/2 d) 1/3

6) In figure ,



DE IIBC ,AD=1 cm and BD= 2 cm. What is the ratio of the ar(Δ ABC) to the ar(ΔADE)

a) 9:1 b) 4:1

c) 3:1 d) 8:1

7) If 3 $\tan\theta$= 4, find the value of $\frac{5\sin\theta - 3\cos\theta}{5\sin\theta + 2\cos\theta}$

a) $\frac{9}{6}$ b) $\frac{11}{26}$

c) $\frac{10}{26}$ d) $\frac{12}{26}$

8) Which of the following will have a terminating decimal expansion?

a) $\frac{77}{210}$ b) $\frac{23}{30}$

c) $\frac{125}{441}$ d) $\frac{23}{8}$

9) The pair of equations ax+2y=7 and 3x+by=16 represent parallel lines if

a) a=b b) 3a=2b

c) 2a=3b d) ab=6

10) The distance of the point P (x,y) from the origin is

a) (0,0) b) $x^2 + y^2$

c) $\sqrt{x^2 + y^2}$ d $\sqrt{x+y}$

11) The probability of selecting a rotten apple randomly from a heap of 900 apples is 0.18. What is the number of rotten apples in the heap?

a) 160 b) 161

c) 162 d) 163

12) Degree of zero polynomial

a) 0 b) Not defined

c) 1 d) None of these

13) In ΔABC, D and E are points on sides AB and AC respectively such that DE ∥ BC and AD:DB= 3:1. If EA= 6.6cm then find AC

a) 6.6cm b) 2.2cm

c) 8.8cm d) 4.4cm

14) The diameter of the wheel of a bus is 1.4 m. The wheel makes 10 revolutions in 5 seconds. The speed of the vehicle (in m/s) is___

a) 44/5 b) 43/5

c) 42/5 d) 41/5

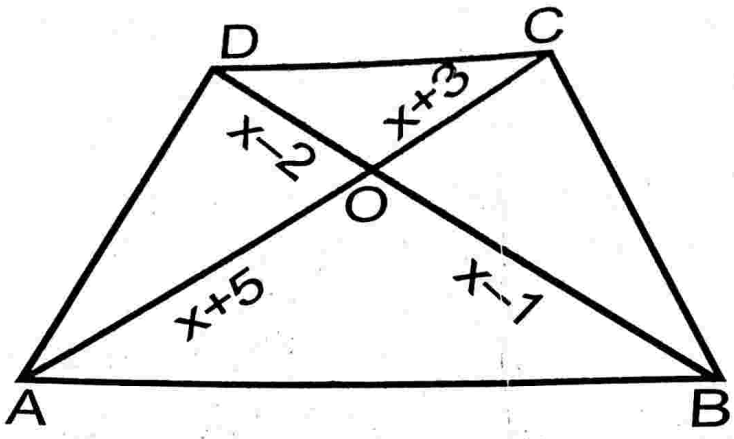
15) Choose the correct option

$$\frac{2\tan 30°}{1-\tan^2 30°} =$$

a) Cos 60° b) Sin 60°

c) tan 60° d) Sin 30°

16) In the given figure, If AB ll DC, find the value of x



a) 7 b) 6

c) 5 d) 4

17) In a triangle ABC , right angled at B, the ratio of AB to AC is $1:\sqrt{2}$. Find the value of $\frac{2\tan A}{1+\tan^2 A}$

a) 2 b) 1

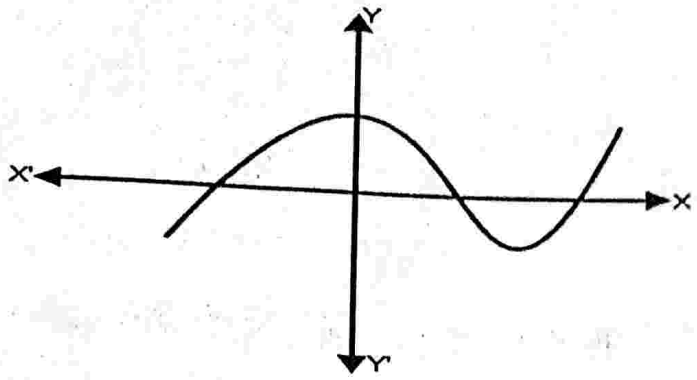
c) 3 d) 4

18) $\frac{2\sqrt{45}+3\sqrt{20}}{2\sqrt{5}}$ On Simplification gives a/an

(a) rational number (b) irrational number

(c) both a and b (d) None of these

19) The graph of y =f (x)is given below, for some polynomial f(x). Find the number of zeros of f(x)



a) 4 b) 2

c) 3 d) 0

20) tanA=

a) $\frac{\cos A}{\sqrt{1-\cos^2 A}}$ b) $\frac{\sec A}{\sqrt{1-\sec^2 A}}$

c) $\frac{\sin A}{\sqrt{1-\sin^2 A}}$ d) $\frac{1}{\sqrt{1-\sin^2 A}}$

SECTION B

Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

21) Find the value of k such that the polynomial $x^2-(k+6)x+2(2k-1)$ has sum of its zeros equal to half of their product

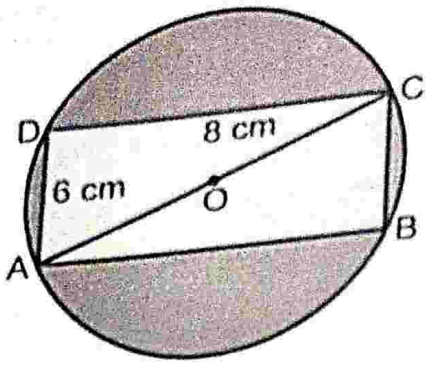
a) 14

b) 7

c) 6

d) 8

22) Find the area of the shaded region in figure. If ABCD is a rectangle with sides 8cm and 6cm and O is the centre of circle[Take π= 3.14]



a) $30.5\ cm^2$ b) $48\ cm^2$

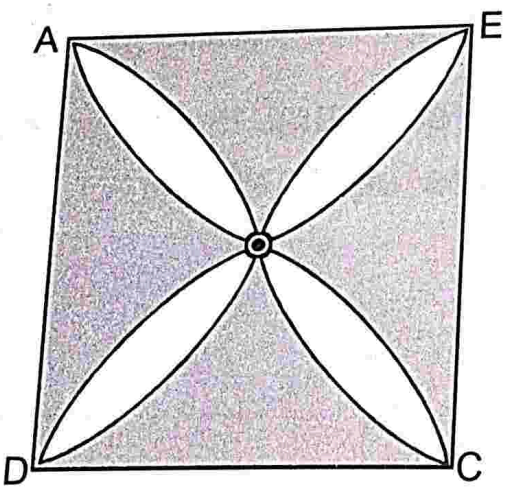
c) $78.5\ cm^2$ d) $40.5\ cm^2$

23) If one zero of the polynomial x^2-4x+1 is $2+\sqrt{3}$ write the other zero.

a) $\sqrt{3}-2$ b) $\sqrt{3}+\sqrt{2}$

c) $2-\sqrt{3}$ d) $2+\sqrt{3}$

24) In figure ABCD is a square of side 14 cm .Semi circle are drawn with each side of square as diameter. What is the area of the shaded region? Use $\pi = \frac{2}{7}$

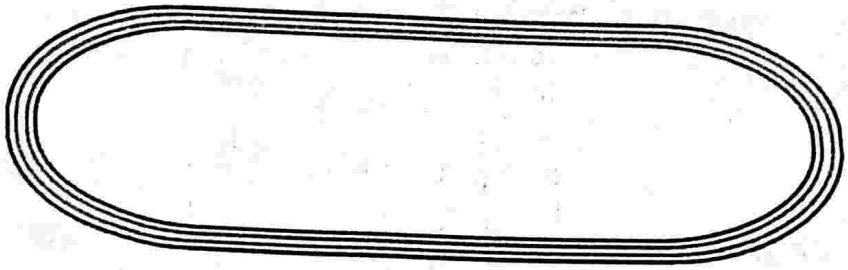


a) 42 cm^2 b) 84 cm^2

c) 48 cm^2 d) 96 cm^2

25) The given figure depicts a racing track whose left and right ends are semicircular.The distance between the two inner parallel line

segments is 60m and they are each 107 m long. If the track is 10 m wide find the area of the track?



a) 4320 m^2

b) 4330m^2

c) 4230 m^2

d) 4340m^2

26) The decimal expansion of the rational number $\frac{14587}{1250}$ will terminate after

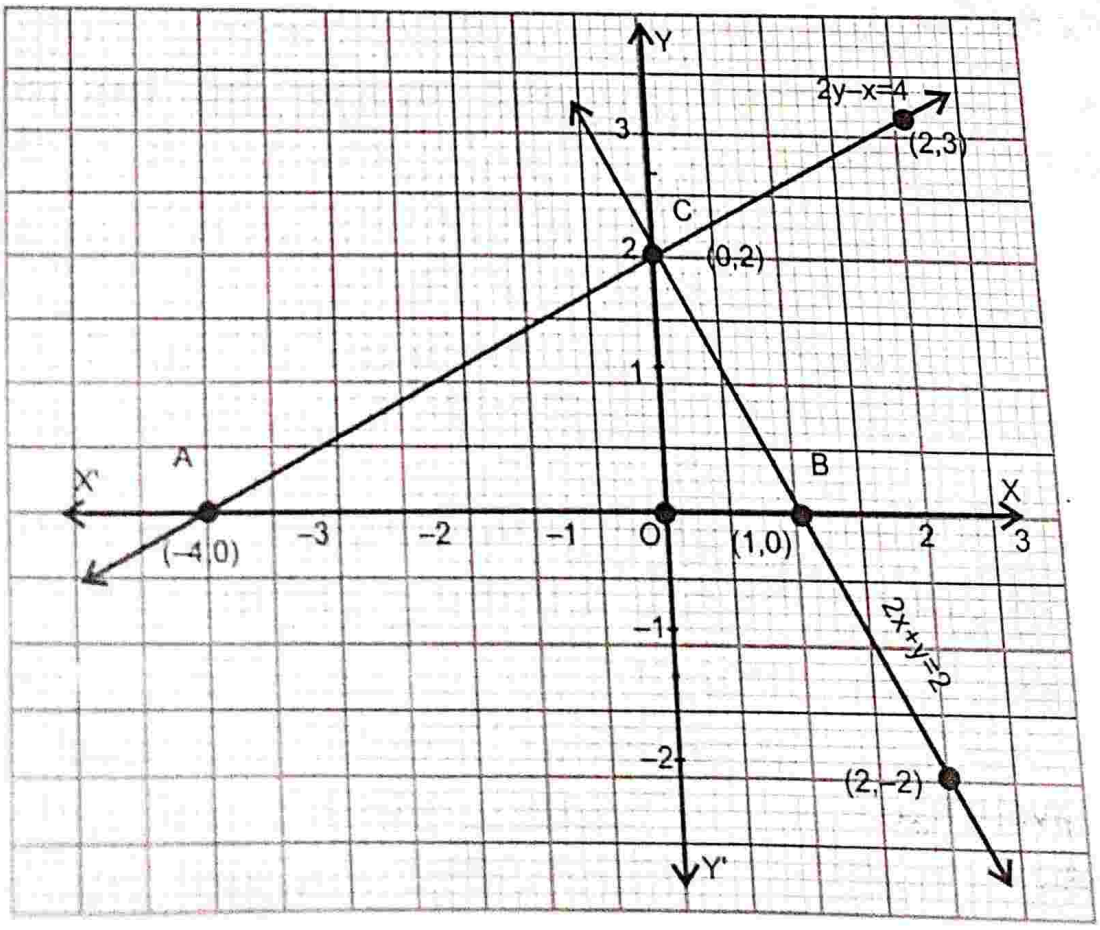
a) one decimal place

b) two decimal places

c) three decimal places

d) four decimal places

27) Given below is the graph representing two linear equations 2x+y=2, 2y-x=4 What is the area of the triangle formed by the two lines and the line y=0?



a) 5 square units
b) 10 square units
c) 6 square units
d) 7 square units

28) If sin x + cosec x=2, then $\sin^{19} x + \cos^{20} x =$

a) 2^{19}
b) 2^{20}
c) 2
d) 2^{39}

29) The taxi charges in a city consist of a fixed charge together with the charge for the distance covered. For a distance of 10 km, the charge paid is ₹105 and for a journey of 15 km, the charge paid is ₹155. What are the fixed charges and the charge per km? How much does a person have to pay for travelling a distance of 25 km.

a) ₹ 250
b) ₹255
c) ₹ 215
d) ₹525

30) Find the largest number which divides 615 and 963 leaving remainder 6 in each case

a) 29
b) 11
c) 78
d) 87

31) Two different dice are tossed together find the probability of getting a doublet

a) $\frac{1}{12}$
b) $\frac{1}{6}$
c) $\frac{1}{2}$
d) $\frac{1}{36}$

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

a) $\frac{13}{11}$
b) $\frac{8}{52}$
c) $\frac{11}{13}$
d) $\frac{12}{13}$

33) A rhombus of side 20cm has two angles of 60° each. Find the length of the diagonals.

a) $20, 20\sqrt{3}$ b) $10, 10\sqrt{3}$

c) $30, 30\sqrt{3}$ d) $40, 40\sqrt{3}$

34) Evaluate $\dfrac{2\cos^2 90° + 4\cos^2 45° + \tan^2 60° + 3\cos ec^2 60° + 1}{3\sec 60° - \frac{7}{2}\sec^2 45° + 2\cos ec 30° - 1}$

a) 0 b) 1

c) 4 d) 5

35) If coordinates of two adjacent vertices of a parallelogram are (3,2),(1,0) and diagonals bisect each other at (2,-5) , find coordinates of the other two vertices.

a) (-1,-12)&(3,-10) b) (1,-12)&(3,-10)

c) (1,-12)&(3,10) d) (1,12)& (3,10)

36) A guy wire attached to a vertical pole of height 18 m is 24 m long and has a stake attached to the other end. How far from the base of the pole should the stake be driven so that the wire will be taut?

a) 6m b) $7\sqrt{6}$m

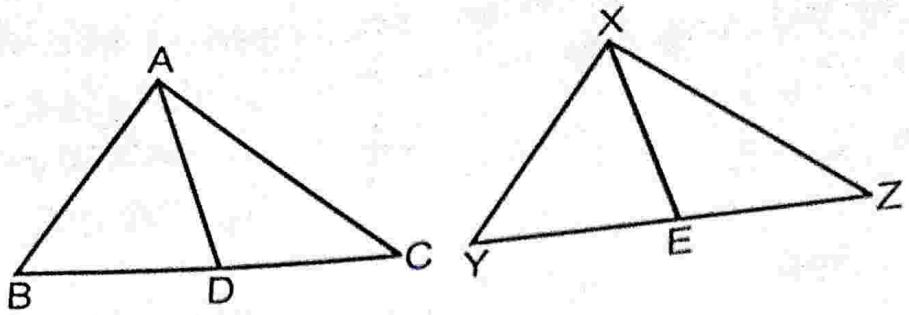
c) $6\sqrt{7}$m d) 7m

37) Point P divides the line segment joining the points A (2 - 5) and B(5,2) in the ratio 2: 3 .Name the quadrant in which P lies

a) I quadrant b) II quadrant

c) III quadrant d) IV quadrant

38) In given figure ΔABC is similar to ΔXYZ and AD and XE are angle bisectors of $\angle A$ and $\angle X$ respectively such that AD and XE in centimetres are 4 and 3 respectively, find the ratio of area of ΔABD and area of ΔXYE



a) 4/3 b) 16/9

c) 9/16 d) 3/4

39) Solve 2x+3y=11 and 2x-4y=-24 and hence find the value of 'm' for which y= mx +3

a) -1 b) 5

c) -2 d) 1

40) In a ΔABC, AM II BC, if tan B=3/4, tanC= 5/12 and BC =56 cm, find the length of AM

a) 13cm b) 15cm

c) 14cm d) 12cm

SECTION C

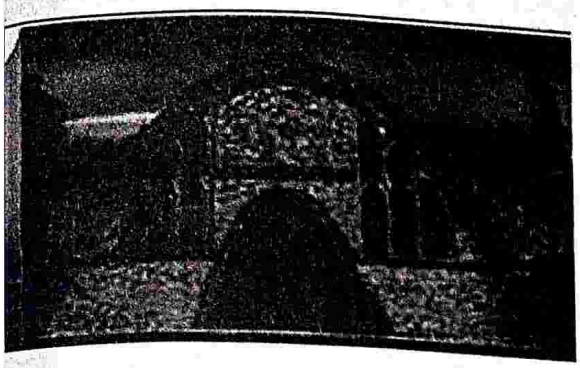
CASE STUDY BASED QUESTIONS:

Section C consists of 10 questions of 1 mark each. Any 8 questions are to be attempted.

Q 41-Q 45 are based on Case Study- 1

CASE STUDY 1:

The below pictures are few natural examples of parabolic shape which are represented by a quadratic polynomial. A parabolic arch is an arch in the shape of a parabola. In structures, their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.



41) In the standard form of quadratic polynomial, ax^2+bx+c , a, b and c are

a) All are real numbers.

b) All are rational numbers.

c) 'a' is a non zero real number and b and c are any real numbers.

d) All are integers.

42) If the given parabolic arch is represented with x^2-2x-8. Find the product of its zeros.

a) 0 b) –4

c) –6 d) –8

43) If 'α'and '$\frac{1}{\alpha}$' are the zeroes of the quadratic polynomial $2x^2-x+8k$ then k is

a) 4 b) 1/4

c) -1/4 d) 2

44) The graph of $x^2+1=0$

a) Intersects x axis at two distinct points.

b) Touches x axis at a point.

c) Neither touches nor intersects x axis.

d) Either touches or intersects x- axis.

45) If the sum of the roots is –p and product of the roots is $(-1/p)$, then the quadratic polynomial is

a) $k\left(-px^2+\frac{x}{p}+1\right)$ b) $k\left(px^2-\frac{x}{p}-1\right)$

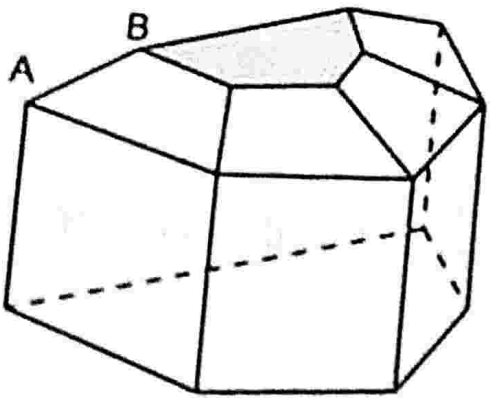
c) $k\left(x^2+px-\frac{1}{p}\right)$ d) $k\left(x^2-px+\frac{1}{p}\right)$

Q 46-Q 50 are based on Case Study- 2

CASE STUDY 2:

SUN ROOM: The diagrams show the plans for a sun room. It will be built onto the wall of a house. The four walls of the sun room are square clear glass panels. The roof is made using-

- **Four clear glass panels, trapezium in shape, all the same size,**
- **One tinted glass panel, half a regular octagon in shape.**



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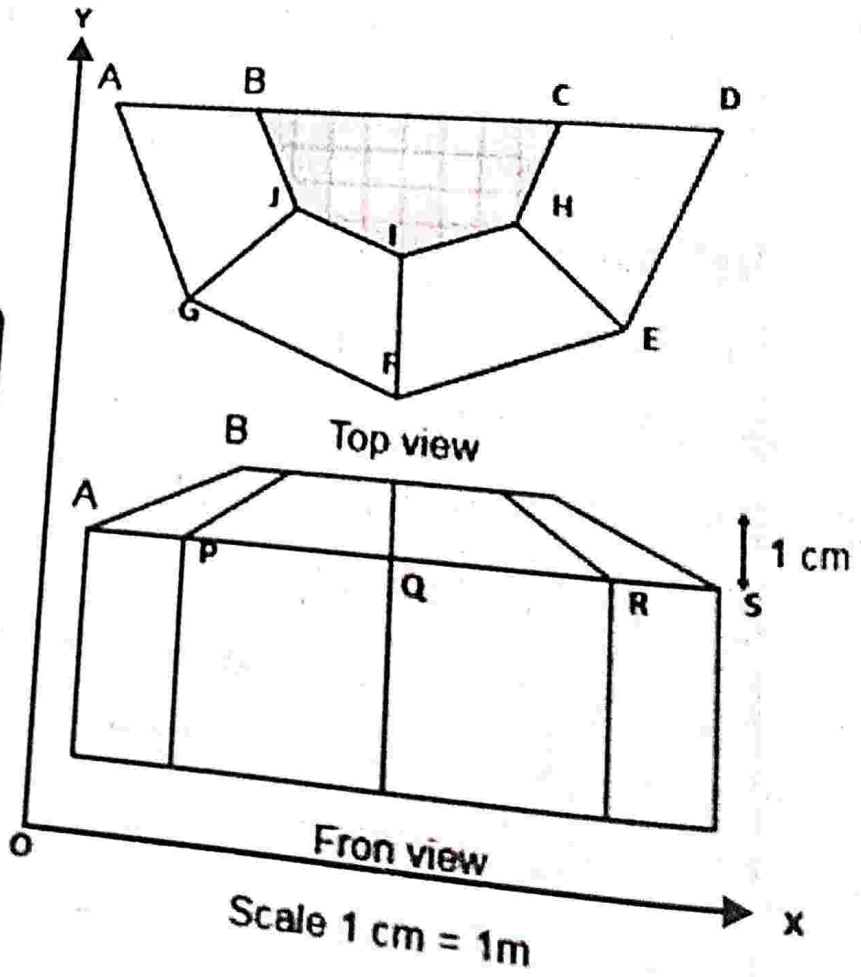


46) Refer to Top View: Find the mid-point of the segment joining the points J (6, 17) and I (9, 16).

a) (33/2, 15/2)

b) (3/2, 1/2)

c) (15/2, 33/2)

d) (1/2, 3/2)

47) Refer to Top View: The distance of the point P from the y-axis is

a) 4

b) 15

c) 19

d) 25

48) Refer to Front View: The distance between the points A and S is

a) 4

b) 8

c) 16

d) 20

49) Refer to Front View: Find the co-ordinates of the point which divides the line segment joining the points A and B in the ratio 1:3 internally.

a) (8.5, 2.0)

b) (2.0, 9.5)

c) (3.0, 7.5)

d) (2.0, 8.5)

50) Refer to Front View: If a point (x, y) is equidistant from Q (9, 8) and S (17, 8), then

a) x+y =13

b) x-13=0

c) y-13=0

d) x-y=13

SAMPLE QUESTION PAPER-4 (TERM 1) 2021-22

SUBJECT : MATHEMATICS

CLASS : X

Time : 90 Min **Marks : 40:**

General Instructions:

1. ***The question papers contain three parts A, B and C.***
2. ***Section A consists of 20 questions of 1 mark each. Attempt any 16 questions.***
3. ***Section B consists of 20 questions of 1 mark each. Attempt any 16 questions.***
4. ***Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.***
5. ***There is no negative marking.***

SECTION A'

Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

1 If two positive integers p and q can be expressed as $p = x^2y^3$ and $q = x^4y^2z; x, y$ being prime numbers then HCF (p, q) is 1

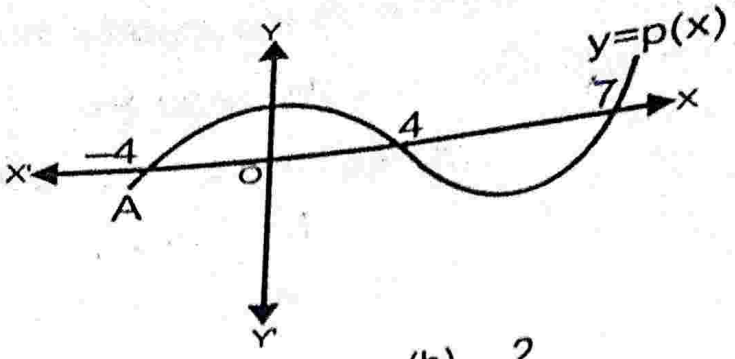
(a) x^4y^2z

(b) $\frac{1}{3}$

(c) xy^2

(d) x^4y^3

2. In the given figure, the number of zeroes of the polynomial $p(x)$ are 1



(a) 1 (b) 2

(c) 3 (d) 4

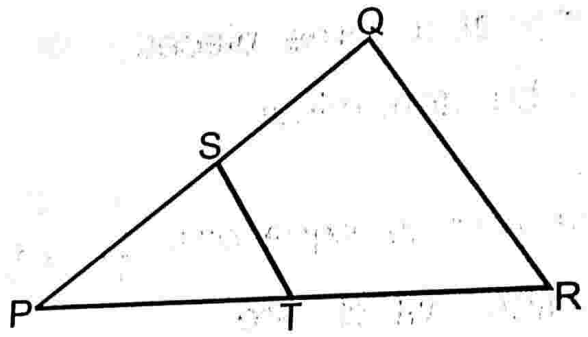
3 The value of k for which the system of equations $2x+3y=5$ *and* $6x+ky=10$ has infinite number of solutions is 1

(a) 1 (b) 3

(c) 9 (d) 0

4 In given figure if $ST \| QR, PS = 2cm$ *and* $SQ = 3cm$, *then* 1

$ar(\Delta PQR) : ar(\Delta PST)$ *is*



(a) 25:4 (b) 2:5

(c) 4:25 (d) 5:2

5 The coordinates of a point A, where AB is diameter of a circle whose centre is (2, –3) and B is (1,4)are: 1

(a) (3,–10) *(b)* (3,10)

(c) (–3,10) *d)* *4,5*

6 ΔABC is right angled at A the value of cotB cotC is : 1

(a) 1

(b) Zero

(c) tanB

(d) tan C

7 Area of a circle whose circumference is 8π cm will be 1

(a) $28\pi\ cm^2$

(b) $16\pi\ cm^2$

(c) $32\pi\ cm^2$

(d) $12\pi\ cm^2$

8 The probability that a red marble selected at random from a jar containing a red, b blue and c green marbles is: 1

(a) $\frac{a}{a+b+c}$

(b) $\frac{a+b}{a+b+c}$

(c) $\frac{a}{a+b+c}$

(d) None of these

9 The decimal expansion of $\frac{29}{50}$ will be 1

(a) Non-terminating repeating

(b) Terminating after six places

(c) Terminating after three places

(d) It cannot be determined

10 Graphically the pair of equations $2x-y+3=0$ and $4x-\frac{10}{5}y+3=0$ represent two lines which are

(a) Intersecting

(b) Coincident

(c) Parallel

(d) None of these

11 Two poles of height 6m and 11m stand on a plane ground. If the distance between their feet is 12m, then the distance between their tops is equal to

(a) 12m

(b) 13m

(c) 5m

(d) 25m

12 The coordinate of reflection of $Q(-2,-3)$ in $x-axis$ are

(a) (2,3) (b) (–2,3)

(c) (2,–3) (d) None of these

13 $2 \tan 30^0 / (1 + \tan^2 30^0)$ is equal to

(a) sin 60° (b) cos60°

(c) tan 60° (d) sin 30°

14 A student randomly selects an English alphabet from a diary, the probability that it is a consonant is:

(a) $\frac{5}{26}$ (b) $\frac{8}{26}$

(c) $\frac{1}{2}$ (d) $\frac{21}{26}$

15 An irrational number between 1. 2 and 3.5 is

(a) 2.5 (b) 2.050505...

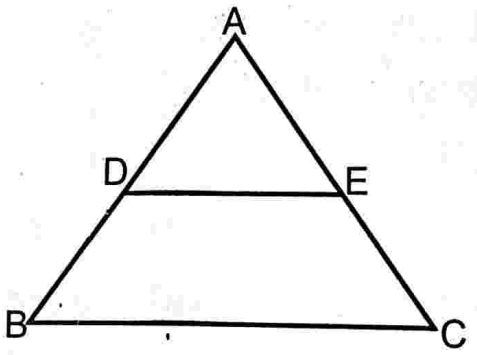
(c) 2.5050050005000005... (d) 2.617617...

16 If $x=a, y=b$ is the solution of the equation $x-y=2$ *and* $x+y=4$ then the values of a and b respectively are:

(a) 3 and 5 (b) 5 and 3

(c) 3 and 1 (d) -1 and -3

17. In ΔABC, D and E are the points on sides AB and AC respectively such that $DE \| BC$ *and* $\frac{AD}{DB}=\frac{3}{1}$, if EA = 4.2 cm, then AC is equal to 1



(a) 3.3cm

(b) 12.6 cm

(c) 5.6 cm

(d) 4.2 cm

18 If HCF (a,b) = 12 and a×b=1800,then LCM (a,b) = 1

(a) 150

(b) 800

(c) 90

(d) 3600

19 Maximum value of probability of an event is 1

(a) 0

(b) −1

(c) $\frac{1}{2}$

(d) 1

20 The least number that is divisible by all the numbers from 1 to 6 is

(a) 70

(b) 120

(c) 60

(d) 80 1

SECTION B

Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

21 The number 3.14 is: 1

(a) An irrational number

(b) A rational number

(c) An integer

(d) A whole number

22 Which of the following linear equations will provide infinitely many solutions with the equation $-5x+7y=2$. 1

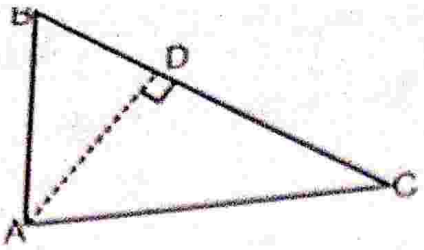
(a) $10x+14y+4=0$

(b) $-10x-14y+4=0$

(c) $-10x+14y+4=0$

(d) $10x-14y=-4$

23 In $\Delta ABC, \angle A=90°$, AB = 5cm and AC = 12cm. If $AD \perp BC$, then AD is equal to 1



(a) $\frac{13}{2}$ (b) $\frac{60}{13}$

(c) $\frac{13}{60}$ (d) $\frac{2\sqrt{5}}{13}$

24 Given that $\sin\alpha=\frac{\sqrt{3}}{2}$ *and* $\cos\beta=\frac{1}{2}$ then the value of $(\alpha+\beta)$ *is*: 1

(a) 90° (b) 30°

(c) 60° (d) 120°

25 The minute hand of a clock is 12cm long. The area swept by minute hand in 30 minutes is: 1

(a) $144\pi cm^2$ *(b)* $72\pi cm^2$

(c) $36\pi cm^2$ *(d)* $42\pi cm^2$

26 A box contains 90 discs, numbered from 1 to 90. If one disc is drawn at random from the box, the probability that it bears a prime number less than 23 is: 1

(a) $\frac{7}{90}$ (b) $\frac{10}{90}$

(c) $\frac{4}{45}$ (d) $\frac{9}{89}$

27 According to Fundamental Theorem of Arithmetic, 2737 is a 1

(a) Composite number (b) Prime number

(c) Neither prime nor composite (d) Even number

28 The graph of $2x+3y=5$ is a 1

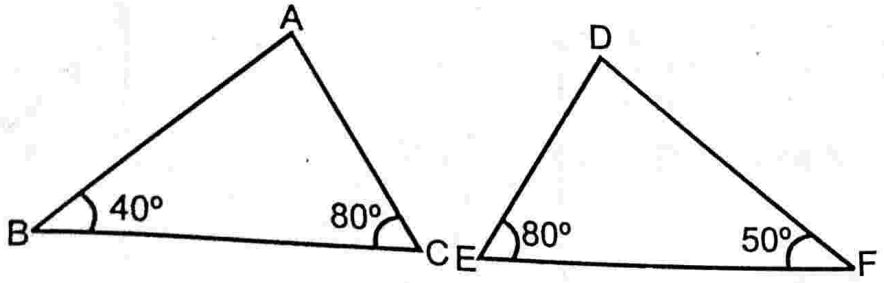
(a) Vertical line

(b) Horizontal line

(c) Slanted straight line

(d) None of these

29 Which of the following is true for the following two triangles? 1



(a) $\Delta ABC \sim DEF$

(b) $\Delta ABC \sim DFE$

(c) $\Delta BAC \sim DEF$

(d) ΔABC is not similar to ΔDEF

30 The minimum value of $\cos\theta, 0° \leq \theta \leq 90°$ is : 1

(a) -1

(b) 1

(c) 0

(d) ½

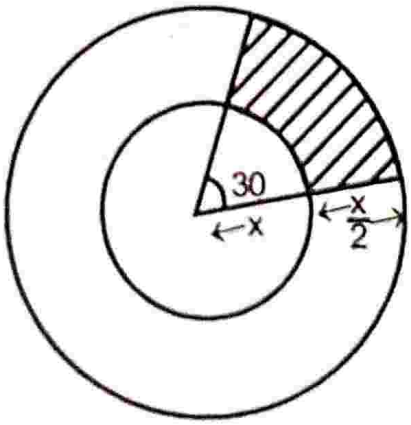
31- In the given figure the area of shaded region (is sq. units) is:1

(a) $\frac{5\pi x^2}{48}$

(b) $\frac{7\pi x^2}{12}$

(c) $\frac{3\pi x^2}{4}$

(d) $\frac{4\pi x^2}{3}$



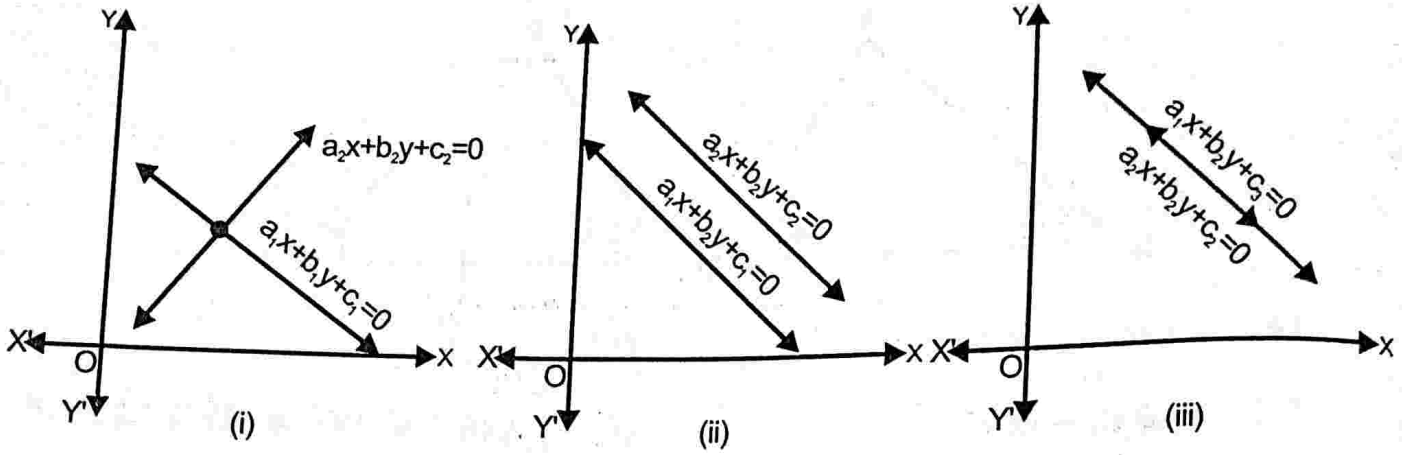
32 The probability of getting a bad egg in a lot of 200 eggs is 0.035. The number of bad eggs in the lot is: 1

(a) 70

(b) 7

(c) 21 (d) 28

33 Observe the three graphs below, which graphs represent a consistent system of equations? 1



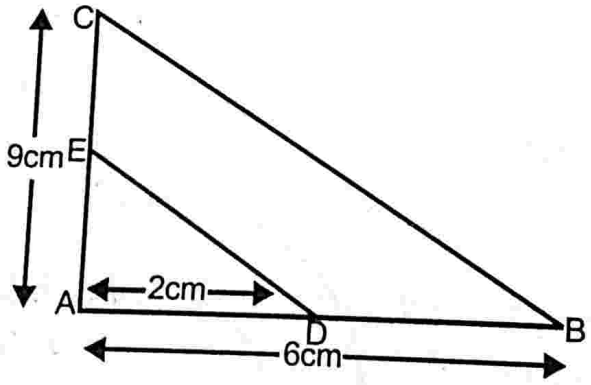
(a) (i) only (b) (ii) only

(c) (i) and (iii) only (d) (ii) and (iii) only

34 In given figure, $DE \parallel BC$. Measure of AE is 1

(a) 3.6 cm (b) 6.3 cm

(c) 3 cm (d) 6 cm



35 If ΔABC is right angled at C, then the value of cos(A+B) is: 1

(a) 0 (b) 1

(c) ½ (d) $\frac{\sqrt{3}}{2}$

36 A garden roller has circumference of 4m. The number of revolutions it makes in moving 40 metres are: 1

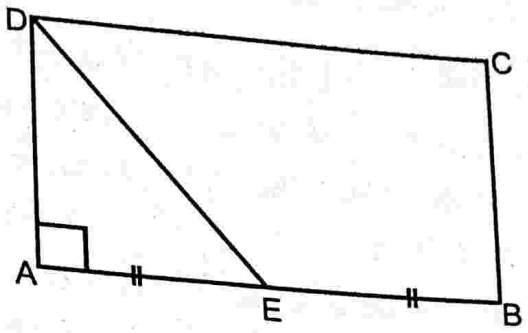
(a) 12

(c) 8

(b) 16

(d) 10

37 In a rectangle ABCD, E is middle point of AB. If AB = 16 cm and AD = 6 cm, then ED is 1



(a) 10 cm

(b) 1.0 cm

(c) 100 cm

(d) 21 cm

38 Two numbers whose sum is 75 and difference is 15, are 1

(a) 45, 30

(b) 35, 40

(c) 25, 50

(d) 52, 23

39 The circumference of a circle is 22 cm. The area of its quadrant is: 1

(a) $\frac{77}{2}$ cm^2

(b) $\frac{77}{4}$ cm^2

(c) $\frac{77}{8}$ cm^2

(d) $\frac{77}{16}$ cm^2

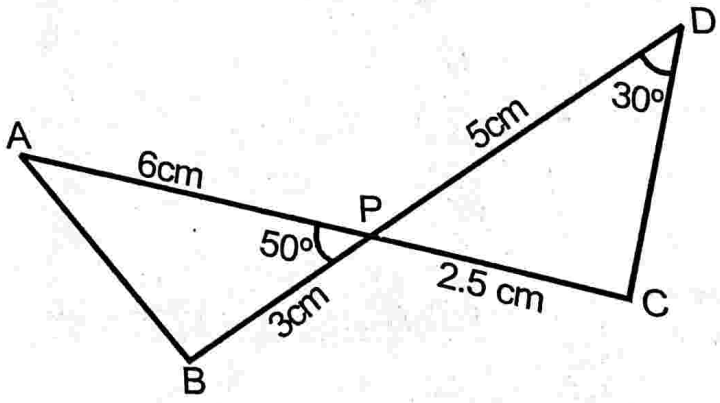
40 In figure, two line segments AC and BD intersect each other at the point P such that PA =6cm, PB = 3cm, PC = 2.5 cm, PD = 5cm, $\angle APB = 50°$ *and* $\angle CDP = 30°$, Then $\angle PBA$ is equal to : 1

(a) 50°

(b) 30°

(c) 60°

(d) 100°



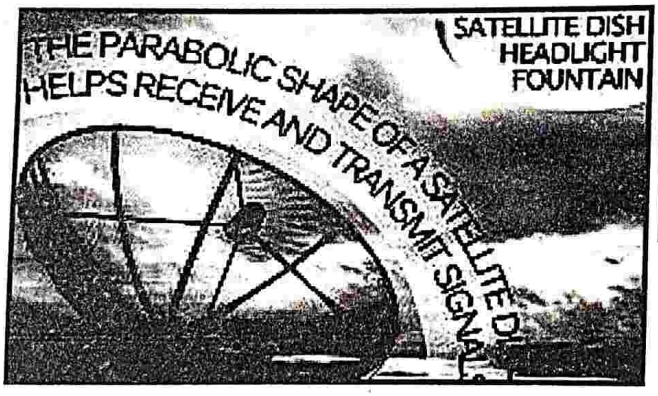
SECTION C

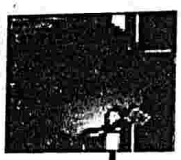
Section C consists of 10 questions based on two Case Studies. Attempt any 4questions from each Case Study

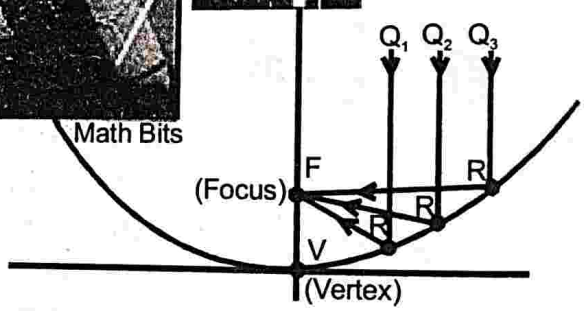
Q41-Q45 are based on Case Study -1

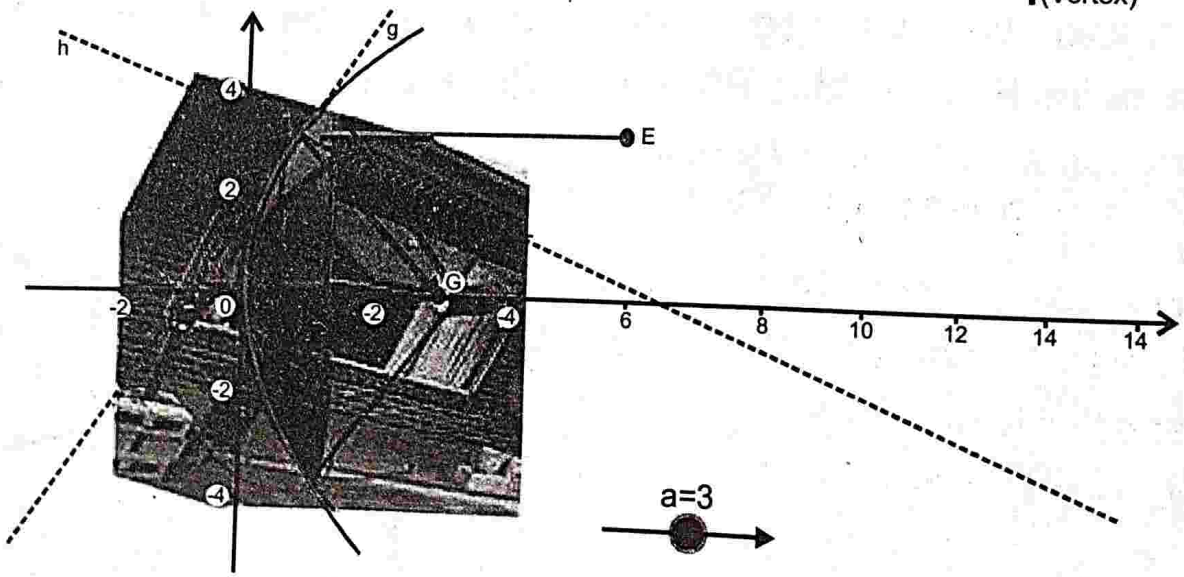
To transmit a signal, a controllers end sit through the horn, and the **dish** focuses the signal in to a relatively narrow beam. When the signal or reaches the viewer's house, it is captured by the satellite dish. A satellite dish is just a special kind of antenna designed to focus on aspecific broadcast source. The standard dish consists of a **parabolic**(bowl-shaped) surface and a central **feed horn**. To transmit a signal, a controller sends it through the horn, and the dish focuses the signal into a relatively narrow beam.

The parabolic shape is due to the quadratic polynomial which is in the standard form $P(x)=ax^2+bx+c$









41 **The zeroes of the quadratic polynomial representing the curve of dish are –5 *and* –6 then the polynomial is** 1

a) $x^2-11x+30$ b) $x^2-11x+30$

c) $x^2+11x-30$ d) $x^2+11x+30$

42 If one of the zeroes of aquadratic polynomial representing the curve of the dish of the form $p(x) = x^2 + ax + b$ is the negative of the other, then which of the following statements is correct?1

a) Polynomial has linear term

b) Constant term of polynomial is negative

c) Both(a) and (b) are correct

d) Neither (a) and (b) are correct

43 The number of polynomials having 3 and 7 as zeroes are 1

a) 1 b) 2

c) 3 d) More than 3

44 If α *and* β are the zeroes of the polynomial $p(x) = x^2 - px + 36$ and $\alpha^2 + \beta^2 = 9$ then the value of p is 1

a) 6 b) 3

c) 9 d) 8

45 If the polynomial representing the curve is $p(x)=x^2 + x/6 - 1/6$ *then*, One of the factors of the polynomial is 1

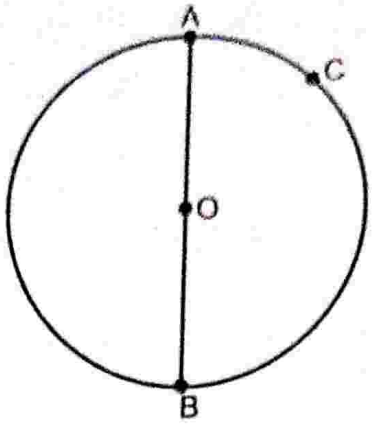
a) $5x + 1$ b) $2x + 1$

c) $x - 1/5$ d) $x - 1/2$

Q46-Q50 are based on Case Study -2

Three friends Jyoti, Laxmi and Reena are playing a game in the park. All three friends are sitting in a circular position at points A, B and C respectively. Jyoti and Laxmi are sitting on the boundary of the circle and in a straight line passing through the centre of the circle as shown in the figure and the distance of all friends from centre is equal . The coordinates of the centre of the circle O are (1,-3). The position of

Jyoti is represented by the coordinates A(4,-1).



Based on the above information, answer the following questions:

46 The formula used to determine the coordinates of the position of Laxmi is: 1

(a) Mid-Point Formula
(b) Distance formula
(c) Area of Circle
(c) None of the above

47 If Reena is sitting at a point whose coordinates are C(x,0), then the values of x are: 1

(a) 2,-1
(b) 3,4
(c) 1,-1
(d) 3,-1

48 The coordinates of B are: 1

(a) (5/2,3/2)
(b) (3/2,1)
(c) (-2,-5)
(d) (5,1)

49 The distance of each girl from the centre is: 1

(a) $\sqrt{13}$ units
(b) $\sqrt{5}$ units
(c) 5 units
(d) 13 units

50 The distance of Jyoti and Laxmi from the centre is: 1

(a) $2\sqrt{13}$ units
(b) $\sqrt{26}$ units
(c) 13 units
(iv) $\sqrt{13}$ units

SAMPLE QUESTION PAPER-5 (TERM 1) 2021-22

SUBJECT : MATHEMATICS(BASIC)

CLASS : X

Time : 90 Min **Marks : 40**

General Instructions:

1. **The question paper contains three parts A, B and C.**
2. Section A consists of 20 questions of 1 mark each. Attempt any 16 questions.
3. Section B consists of 20 questions of 1 mark each. Attempt any 16 questions.
4. Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.
5. **There is no negative marking.**

SECTION A

Section A consists of 20 questions. Any 16 questions are to be attempted

1 Cards marked with numbers 1 to 25 are placed in the box and mixed thoroughly. One card is drawn at random from the box.What is the probability of getting a card with multiple of 5?

(a) 1 (b) 0

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

2 Find the area of the sector of a circle of radius 14 cm with central angle45^0.

(a) $76cm^2$ (b) $77cm^2$

(c) $66cm^2$ (d) none ofthese 1

3 The value of (sin 45° + cos 45°) is 1

(a) $\frac{1}{\sqrt{2}}$ (b) $\sqrt{2}$

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

4 A bag has 4 red balls and 2 yellow balls. A ball is drawn from the bag without looking into the bag. What is probability of getting a red ball? 1

(a) $\frac{1}{6}$ (b) $\frac{2}{3}$

(c) $\frac{1}{3}$ (d) 1

5 The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ have 1

(a) infinite number of solutions (b) unique solution

(c) no solution (d) one solution

6 If $3x + 2y = 13$ and $3x - 2y = 5$, represent a pair of linear equations then the value of $x + y$ is: 1

(a) 5 (b) 3

(c) 7 (d) None of these

7 The decimal expansion of $\frac{63}{72 \times 175}$ is 1

(a) terminating

(b) non-terminating

(c) non terminating and repeating

(d) non terminating and non repeating

8 $3 \tan^2 A - 3 \sec^2 A + 1$ is equal to 1

(a) 6 (b) -2

(c) 1 (d) -3

(a) (2, –3)
(b) (2, 3)
(c) (–2, 3)
(d) (–2, –3)

SECTION B

Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted

21 The length of the minute hand of a clock is 14 cm. What is the area swept by the minute hand in 5 minutes? 1

(a) 154 cm^2
(b) $\frac{154}{3} cm^2$
(c) 77 cm^2
(d) 308 cm^2

22 XY is drawn parallel to the base BC of a ΔABC cutting AB at X and AC at Y. If AB = 4BX and YC = 2 cm, then AY = 1

(a) 2 cm
(b) 6 cm
(c) 8 cm
(d) 4 cm

23 Two dice are thrown together. Find the probability that the product of the numbers on the top of the dice is 5 1

(a) $\frac{1}{9}$
(b) $\frac{1}{18}$
(c) $\frac{1}{36}$
(d) $\frac{1}{2}$

24 Find the value of k for which the system 3x + ky = 4, 6x – 10y = 8 will have infinitely many solutions. 1

(a) 5
(b) -5
(c) 10
(d) -10

5 If the perimeter and the area of a circle are numerically equal, then the radius of the circle is 1

(a) 2 units
(b) π units

(c) 4 units

(d) 7 units

26 A sector with central angle 56°, cut out from a circle, has area $17.6cm^2$. Find the radius of the circle. 1

(a) 6cm

(b) 7cm

(c) 5cm

(d) 8cm

27 What is the value of $\left(\frac{\cos\theta}{\cot\theta}\right)^2 + \left(\frac{\sin\theta}{\tan\theta}\right)^2$? 1

(a) 0

(b) 1

(c) -1

(d) $\sin\theta$

28 What is the minimum value of $\cos\theta$, $0 \leq \theta \leq 90°$? 1

(a) -1

(b) 0

(c) 1

(d) ½

29 If in ΔABC, $\angle C = 90°$, then $\sin(A + B) =$ 1

(a) 0

(b) ½

(c) $1/\sqrt{2}$

(d) 1

30 Three alarm clocks ring at intervals of 4, 12 and 20 minutes respectively. If they start ringing together at 6am, at what time will they next ring together? 1

(a) 6.30 am

(b) 7 am

(c) 8 am

(d) 7.30 am

31 Find the least number that is divisible by all the numbers between 1 and 5 (both inclusive). 1

(a) 50

(b) 75

(c) 60

(d) 100

32 If a pair of linear equations in two variables is inconsistent, then the lines represented by two equations are 1

(a) (2, –3)
(b) (2, 3)
(c) (–2, 3)
(d) (–2, –3)

SECTION B

Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted

21 The length of the minute hand of a clock is 14 cm. What is the area swept by the minute hand in 5 minutes? 1

(a) 154 cm^2
(b) $\frac{154}{3} cm^2$
(c) 77 cm^2
(d) 308 cm^2

22 XY is drawn parallel to the base BC of a ΔABC cutting AB at X and AC at Y. If AB = 4BX and YC = 2 cm, then AY = 1

(a) 2 cm
(b) 6 cm
(c) 8 cm
(d) 4 cm

23 Two dice are thrown together. Find the probability that the product of the numbers on the top of the dice is 5 1

(a) $\frac{1}{9}$
(b) $\frac{1}{18}$
(c) $\frac{1}{36}$
(d) $\frac{1}{2}$

24 Find the value of k for which the system 3x + ky = 4, 6x – 10y = 8 will have infinitely many solutions. 1

(a) 5
(b) -5
(c) 10
(d) -10

25 If the perimeter and the area of a circle are numerically equal, then the radius of the circle is 1

(a) 2 units
(b) π units

(c) 4 units (d) 7 units

26 A sector with central angle 56°, cut out from a circle, has area $17.6cm^2$. Find the radius of the circle. 1

(a) 6cm (b) 7cm

(c) 5cm (d) 8cm

27 What is the value of $\left(\frac{\cos\theta}{\cot\theta}\right)^2 + \left(\frac{\sin\theta}{\tan\theta}\right)^2$? 1

(a) 0 (b) 1

(c) -1 (d) **sin** θ

28 What is the minimum value of $\cos\theta$, $0 \leq \theta \leq 90°$? 1

(a) -1 (b) 0

(c) 1 (d) ½

29 If in ΔABC, $\angle C = 90°$, then sin (A + B) = 1

(a) 0 (b) ½

(c) $1/\sqrt{2}$ (d) 1

30 Three alarm clocks ring at intervals of 4, 12 and 20 minutes respectively. If they start ringing together at 6am, at what time will they next ring together? 1

(a) 6.30 am (b) 7 am

(c) 8 am (d) 7.30 am

31 Find the least number that is divisible by all the numbers between 1 and 5 (both inclusive). 1

(a) 50 (b) 75

(c) 60 (d) 100

32 If a pair of linear equations in two variables is inconsistent, then the lines represented by two equations are 1

(a) Intersecting

(b) parallel

(c) coincident

(d) none of these

33 In a square of side 10 cm, its diagonal = 1

(a) 15 cm (b) 20 cm

(c) 12 cm (d) $10\sqrt{2}$ cm

34 The pair of equations x = a and y = b graphically represents the lines which are 1

(a) parallel

(b) intersecting at (a, b)

(c) coincident

(d) intersecting at (b, a)

35 Sum of two numbers is 35 and their difference is 13, then the numbers are 1

(a) 25 and 10

(b) 24 and11

(c) 28 and 15

(d) none of these

36 If the areas of two similar triangles are in ratio 25:64, what is the ratio of their corresponding sides?

(a) 8 : 5 (b) 5 : 8

(c) 1 : 2 (d) 2 : 1

37 If in triangles ABC and DEF, AB/BC= DE/FD, then the triangles will be similar if 1

(a) $\angle B = \angle E$

(b) $\angle A = \angle D$

(c) $\angle B = \angle D$

(d) $\angle A = \angle F$

38 If a straight line is drawn parallel to one side of a triangle intersecting the other two sides in distinct points, then the other two sides are divided in the same ratio. This is called 1

(a) Pythagoras theorem

(b) Thales theorem

(c) Converse of Pythagoras theorem

(d) None of these

39 A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, what is the probability that it bears a one-digit number? 1

(a) 1/90

(b) 1/45

(c) 1/9

(d) 1/10

40 If the area of a circle is 154 cm^2, then its perimeter is 1

(a) 11 cm

(b) 22 cm

(c) 44 cm

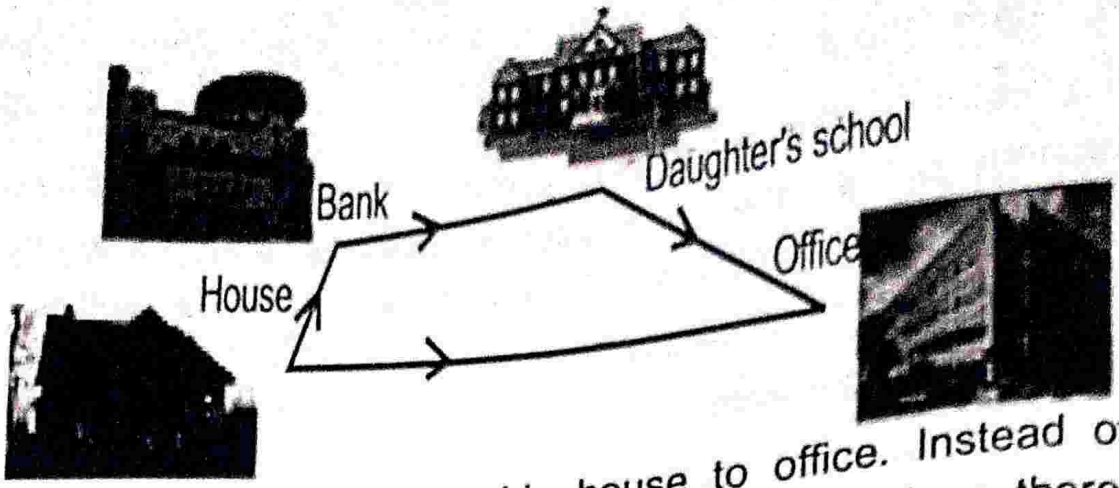
(d) 55 cm

SECTION C

CASE STUDY BASED QUESTIONS

Section C consists of 10 questions of 1 mark each. Any 8 questions are to be attempted.

Case Study 1



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.

Based on the given information, answer the questions NO. 41-45

41 What is the distance between house and bank? 1

(a) 5 (b) 10

(c) 12 (d) 27

42 What is the distance between Daughter's School and bank? 1

(a) 5 (b) 10

(c) 12 (d) 27

43 If a shop is situated exactly midway between bank and the school, then the coordinates of the shop are 1

(a) (7/2,6) (b) (13,20)

(c) (15/2,9) (d) (9,11)

44 What is the total distance travelled by Aditya to reach the office? 1

(a) 5 (b) 10

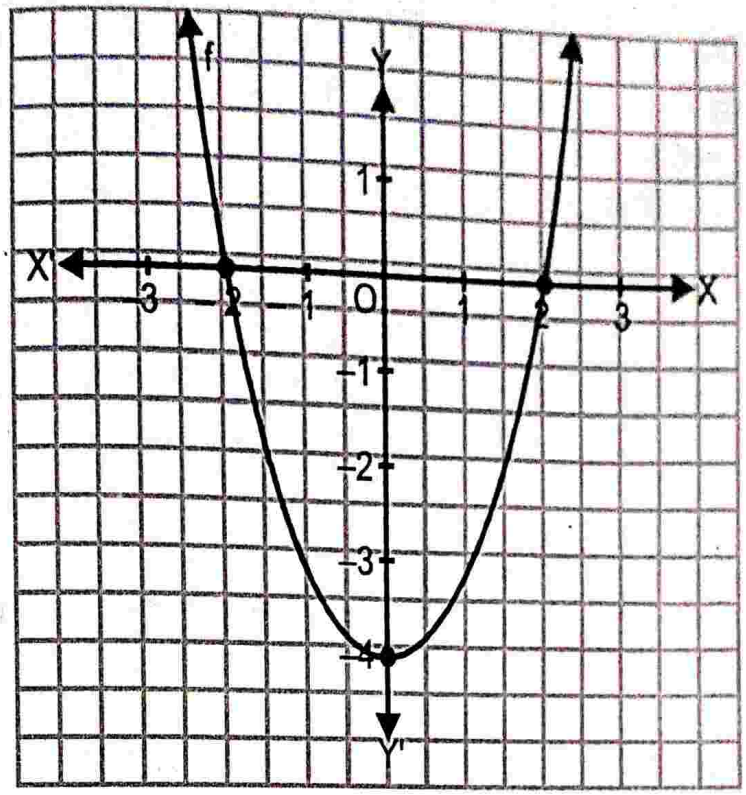
(c) 12 (d) 27

What is the distance between house and office? 1

45 (a) 24.6 (b) 26.4

(c) 24 (d) 26

Case Study 2



Puja tied a rope between two poles for drying clothes in her garden. She was very happy that the rope is working fine but One day due to heavy storm the rope bent as shown in the below figure. The bent shape followed a mathematical shape.

Based on the given information, answer the questions NO. 46 - 50

46 How many zeroes are there for the polynomial? 1

(a) 2 (b) 3

(c) 1 (d) 0

47 What is the shape in which the wire is bent? 1

(a) spiral (b) elipse

(c) parabola (d) circle

1

48 The zeroes of the polynomial are:

(a) -2,3 (b) -2,2

(c) -2,0 (d) -l, -2

49 Which of the following polynomials is represented by the graph?

(a) $x^2 + 4$ (b) $x^2 - 4$

(c) $x + 4$ (d) $x - 2$

50 What is the value of the polynomial if $x = -2$? 1

(a) 2 (b) -4

(c) 0 (d) 9

SAMPLE QUESTION PAPER-5 (TERM 1) 2021-22

SUBJECT :MATHEMATICS(STANDARD)

CLASS : X

Time : 90 Min **Marks : 40**

General Instructions:

1. ***The question paper contains three parts A, B and C.***
2. ***Section A consists of 20 questions of 1 mark each. Attempt any 16 questions.***
3. ***Section B consists of 20 questions of 1 mark each. Attempt any 16 questions.***
4. ***Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.***
5. ***There is no negative marking.***

SECTION A

Section A consists of 20 questions. Any 16 questions are to be attempted

1 The LCM of the smallest composite number and the smallest prime number is 1

(a) 1 (b) 2 (c) 3 (d) 4

2 Seven times a two-digit number is equal to four times the number obtained by reversing the order of its digit. If the difference between the digits is 3, then the number is

(a) 36 (b) 33

(c) 66 (d) none of these

A girl walks 200 m towards East and the she walks 150m towards North. The distance of the girl from the starting point is 1

(a) 350m (b) 250m
(c) 300m (d) 225m

4 ABC and BDE are two equilateral triangles such that D is the midpoint of BC. Ratio of the areas of triangles ABC and BDE is 1

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

5 What is the probability of getting 53 Fridays in a leap year? 1

(a) 53/365 (b) 53/366
(c) 1/7 (d) 2/7

6 The perimeters of two similar triangles ABC and PQR are 60 cm and 36 cm respectively. If PQ = 9 cm, then AB will be 1

(a) 6 cm (b) 10 cm
(c) 15 cm (d) 24 cm

7 In ΔABC, right-angled at B, AB = 5 cm and $\angle ACB = 30°$ then the length of the side AC is 1

(a) $5\sqrt{3}$ cm (b) $2\sqrt{3}$ cm
(c) 10 cm (d) None of these

8 The largest number which divides 70 and 125, leaving remainders 5 and 8, respectively, is 1

(a) 13 (b) 65
(c) 875 (d) 1750

9 The solution of the equations x + 2y = 1.5 and 2x + y = 1.5 is 1

(a) x = 1, y=1 (b) x = 1.5, y = 1.5
(c) x = 0.5, y = 0.5 (d) none of these

10 The points A(0, –2), B(3, 1), C(0, 4) and D(–3, 1) are the vertices of a 1

(a) parallelogram (b) rectangle
(c) square (d) rhombus

11 The decimal expansion of the number $\frac{441}{2^2 \times 5^3 \times 7}$ is 1

(a) terminating

(b) non-terminating but repeating

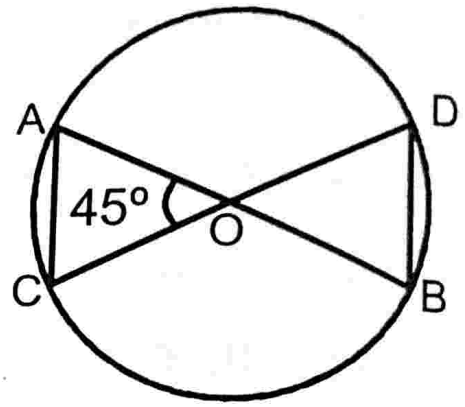
(c) non-terminating non repeating

(d) terminating after two places of decimals

12 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 rows of trees (i.e., only one type of trees in one row). The number of minimum rows required are 1

(a) 2 (b) 3 (c) 10 (d) 12

13 O is the point of intersection of two equal chords AB and CD such that OB = OD, then triangles OAC and ODB are 1



(a) equilateral but not similar

(b) isosceles but not similar

(c) equilateral and similar

(d) isosceles and similar

14 Corresponding sides of two similar triangles are in the ratio of 2:3. If the area of the smaller triangle is 48 sq.cm, then the area of the larger triangle is: 1

(a) 230 sq.cm (b) 106 sq.cm.

(c) 107 sq.cm (d) 108 sq.cm

15 In a right triangle ABC, right-angled at B, if tan A = 1, then the value of 2 sin A cos A = 1

(a) 0 (b) 1

(c) ½ (d) n.d.

16 A pendulum swings through an angle of 30^0 and describes an arc 8.8 cm in length. Find the length of the pendulum. 1

(a) 16cm (b) 16.5cm

(c) 16.8cm (d) 17cm

17 In ΔABC, $AB = 6\sqrt{3}$ cm, AC = 12 cm and BC = 6 cm. The angle B is 1

(a) 120° (b) 60°

(c) 90° (d) 45°

18 If $\sin A + \sin^2 A = 1$, then $\cos^2 A + \cos^4 A = ?$ 1

(a) 1 (b) 0

(c) 2 (d) 4

19 If (6, k) is a solution of the equation $3x + y - 22 = 0$, then the value of k is: 1

(a) 4 (b) –4

(c) 3 (d) –3

20 Cards marked with numbers 1 to 50 are placed in the box and mixed. One card is drawn at random from the box. What is the probability of getting a number divisible by 3? 1

(a) 1/5 (b) 1/25

(c) 1/50 (d) 8/25

SECTION B

Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted

21 The decimal representation of $\frac{113}{2^3 \times 5^2}$ will terminate after how many decimal places? 1

(a) 1 (b) 2

(c) 3 (d) 4

22 A two-digit number is 4 more than 6 times the sum of its digits.

If 18 is subtracted from the number, the digits are reversed, then the number is 1

(a) 36 (b) 46

(c) 64 (d) none of these

23 If $\sin A - \sqrt{3} \cos A = 0$ and $0° < A < 90°$, find the value of A. 1

(a) 30° (d) 45°

(c) 60° **(d) 90°**

24 The pair of equations $y = 0$ and $y = -7$ has 1

(a) one solution (b) two solutions

(c) infinitely many solutions (d) no solution

25 The smallest 4-digit number which is divisible by 18, 24 and 32 is ? 1

(a) 288 (b) 1000

(c) 1152 (d) 1440

26 A box contains 3 blue, 2 white, and 4 red balls. If a ball is drawn at random from the box, what is the probability that it will be neither a blue ball nor a red ball? 1

(a) 1/3 (b) 2/9

(c) 7/9 (d) 2/3

27 Three coins are tossed simultaneously. What is the probability of getting exactly two heads? 1

(a) 1/8 (b) 1/4

(c) 3/8 (d) 1/2

28 $(1 + \tan A + \sec A)(1 + \cot A - \operatorname{cosec} A) =$ 1

(a) -1 (b) 0

(c) 1 (d) 2

29 If P(–1, 1) is the midpoint of the line segment joining A(–3, b) and B(1, b + 4)then the value of b is 1

(a) 1 (b) –1

(c) 2 (d) 0

30 In triangles ABC and DEF, $\angle A = \angle E = 40^0$, AB : ED = AC: EF and $\angle F = 65^0$, then $\angle B =$ 1

(a) 35^0 (b) 65^0

(c) 75^0 (d) 85^0

31 If the distance between the points (8, p) and (4, 3) is 5 units then value of p is 1

(a) 6 (b) 0

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

32 Sin A + cos B = 2, A = 90^0 ,then what is the value of B? 1

(a) 0 (b) 30^0

(c) 45^0 (d) 90^0

33 **Which of the following is not irrational?** 1

(a) $(3 + \sqrt{7})$ (b) $(3 - \sqrt{7})$

(c) $(3 + \sqrt{7})(3 - \sqrt{7})$ (d) $3\sqrt{7}$

34 Two congruent triangles are actually similar triangles with the ratio of corresponding sides as 1

(a) 1:2 (b) 1:1

(c) 1:3 (d) 2:1

35 The coordinates of the centroid of a triangle whose vertices are (0, 6), (8,12) and (8, 0) is 1

(a) (4, 6) (b) (16, 6)

(c) (8, 6) (d) (16/3, 6)

36 If the perimeter of a semicircular protractor is 36 cm, then find its diameter. 1

(a) 14cm (b) 16cm (c) 18cm (d) 12cm

37 A chord 10 cm long is drawn in a circle whose radius is $5\sqrt{2}$ cm. Find the area of the minor segment formed.(Take $\pi=3.14$) 1

(a) $16cm^2$ (b) $14.5cm^2$

(c) $14.25\ cm^2$ (d) none of these

38 The value of k for which (–4) is a zero of the polynomial $x^2 - x - (2k + 2)$ is 1

(a) 3 (b) 9 (c) 6 (d) –1

39 The circumference of a circle is 88 cm. Find the area of the sector whose central angle is 72^0. 1

(a) $123cm^2$ (b) $123.2\ cm^2$

(c) $123.4\ cm^2$ (d) none of these

40 The solution of the equations $0.4x + 0.3y = 1.7$ and $0.7x - 0.2y = 0.8$ is 1

(a) $x = 1$ and $y=2$ (b) $x = 2$ and $y=3$

(c) $x = 3$ and $y= 4$ (d) $x = 5$ and $y =4$

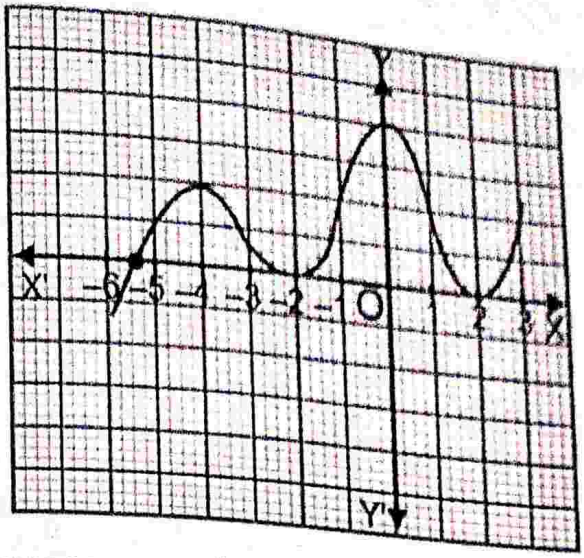
SECTION C

CASE STUDY BASED QUESTIONS

Section C consists of 10 questions of 1 mark each. Any 8 questions are to be attempted.

Case Study 1

One day, due to heavy storm an electric wire got bent as shown in the figure. It followed some mathematical shape of curve. ***Based on the given information, answer the questions NO. 41-45***



41 How many zeroes are there for the polynomial (shape of the wire)? 1

(a) 2 (b) 3 (c) 4 (d) 5

42 The zeroes of the polynomial formed by wire are : 1

(a) 2, 0, -2 (b) 2, -2, -5

(c) 2, -2, -5.5 (d) None of these

43 Find the quadratic polynomial whose zeros are 3 and -4. 1

(a) $x^2 + 4x + 2$ (b) $x^2 + x - 12$

(c) $x^2 - 7x - 12$ (d) none of these

44 Name the type of expression of the polynomial in the above graph? 1

(a) quadratic (b) cubic (c) linear (d) bi-quadratic

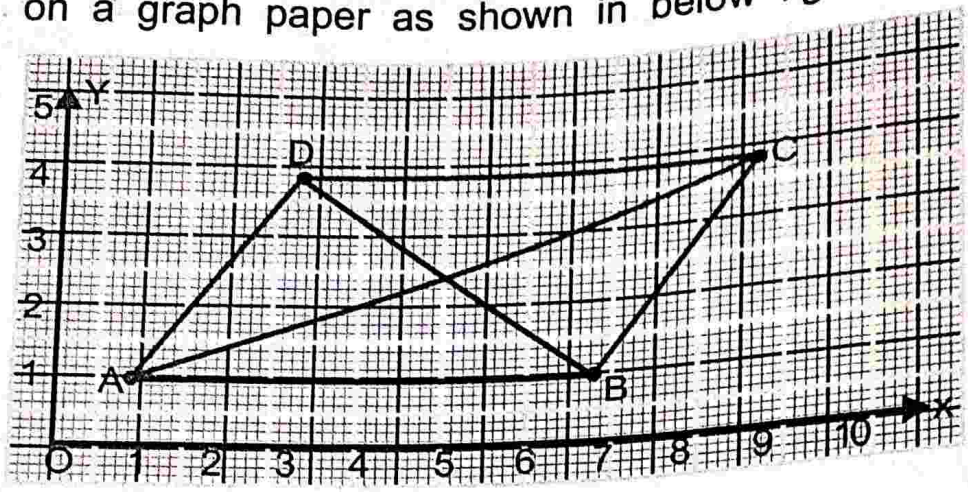
45 If one zero of the polynomial $x^2 - 2x - 3$ is -1, then find the other zero.

(a) 3 (b) -3 (c) 2 (d) -2

Case Study 2

One day, Mohan visited his friend's apartment. From his balcony, he observed that there is flower bed on the ground which is in the shape of a parallelogram. Four red colour poles are there at

the corners of the garden. He draws the sketch of the flower bed on a graph paper as shown in below figure.



Based on the given information, answer the questions NO. 46-50

46 The coordinates of the vertex D are: 1

(a) (3,4) (b) (4,3)

(c) (3,3) (d) (4,4)

47 The coordinates of the point of intersection of the diagonals are:

(a) (5,5) (b) (5/2, 5/2)

(c) (5, 5/2) (d) (5/2, 5)

48 The length of the side AB is: 1

(a) 5 units (b) 6 units

(c) 7 units (d) none of these

49 The length of the side AD is: 1

(a) $\sqrt{13}$ units (b) 13 units

(c) 14 units (d) $\sqrt{14}$ units

50 If we take A as origin and AB as x-axis, then the coordinates of M are: 1

(a) (4, 3/2) (b) (3/2, 4)

(c) (4, 4) (d) (3/2, 3/2)

SAMPLE PAPER-1

ANSWER KEY

MATHEMATICS (BASIC) CLASS X

1.	B	2.	A
3.	C	4.	D
5.	C	6.	C
7.	D	8.	C
9.	A	10.	D
11.	A	12.	D
13.	D	14.	A
15.	A	16.	C
17.	D	18.	D
19.	A	20.	A
21.	B	22.	C
23.	B	24.	D
25.	A	26.	C
27.	D	28.	A
29.	C	30.	A
31.	C	32.	A
33.	D	34.	A
35.	C	36.	D
37.	A	38.	C
39.	A	40.	B
41.	A	42.	D
43.	A	44.	C
45.	C	46.	B
47.	C	48.	A
49.	A	50.	C

ANSWER KEY

SAMPLE QUESTION PAPER -1

MATHEMATICS (STANDARD) CLASS X

1	B	2	B
3	D	4	B
5	C	6	A
7	B	8	A
9	A	10	D
11	A	12	D
13	A	14	B
15	D	16	B
17	D	18	A
19	B	20	B
21	D	22	D
23	C	24	A
25	C	26	B
27	C	28	D
29	B	30	A
31	C	32	A
33	C	34	B
35	C	36	A
37	C	38	D
39	A	40	D
41	A	42	D
43	C	44	C
45	D	46	B
47	C	48	A
49	A	50	C

ANSWER KEY

SAMPLE QUESTION SAMPLE PAPER-3

CLASS -X MATHEMATICS (STANDARD)

SECTION - 2021 -22

TERM -I

QUESTION NO.	CORRECT Option	SECTION A ANSWERS	MARKS
1	d	Ratio of LCM:HCF=12:1	1
2	d	K=10	1
3	b	AC=250m	1
4	c	BC=20 units	1
5	c	Probability of getting a prime number= $\frac{1}{2}$	1
6	a	9:1	1
7	b	$\frac{11}{26}$	1
8	d	terminating decimal expansion	1
9	**d**	**ab=6**	**1**
10	**c**	$\sqrt{x^2+y^2}$	**1**
11	c	Favourable events=162	1
12	b	As D =21>0	1
13	c	AC=AE+EC=6.6+2.2=8.8cm	1
14	a	Speed= $\frac{44}{5}$ m/s	1
15	c	tan60°	1
16	a	X=7	1

	b	1	1
17	a	6(a rational number)	1
18	c	Number of zeros of f(x)=3	1
19	c	**tanA=** $\frac{\sin A}{\sqrt{1-\sin^2 A}}$	1
20	b	K=7	1
21	a	**Area of shaded region= 30.5cm^2**	1
22	c	**Other zero is 2-$\sqrt{3}$**	1
23	b	Area of shaded part=84 cm^2	1
24	d	Area of the Track=4340 m^2	1
25			
26	d	11.6696, The given rational number will terminate after four decimal places	1
27	a	Area of triangle=5 square units	1
28	c	$\sin^{19} x + \cos ec^{20} x = 2$	1
29	b	For travelling a distance of 25km a person has to pay 255	1
30	d	Required number=87	1
31	b	P(getting a doublet)=$\frac{1}{6}$	1
32	c	Probability that the card drawn is neither an ace nor a king=$\frac{11}{13}$	1
33	c	**Lengths of diagonals are 20cm and $20\sqrt{3}$ cm**	1
34	d	Value is 5	1
35	b	The coordinates of the other two vertices (1,-12)and(3,-10)	1

36	c	$6\sqrt{7}$	1
37	d	Point P(3.2,-2.2) lies in IV quadrant	1
38	b	$\frac{Area(\Delta ABD)}{Area(\Delta XYE} = \frac{16}{9}$	1
39	a	m= -1	1
40	b	AM= 15cm	1
41	c	'a' is a non zero real number and b and c are any real numbers	1
42	d	D=0	1
43	b	$\frac{1}{4}$	1
44	c	Neither touches nor intersects x-axis	1
45	c	$K(x^2 + px - \frac{1}{p})$	1
46	c	(15/2,33/2)	1
47	a	4	1
48	c	16	1
49	d	(2.0,8.5)	1
50	b	x-13=0	1

ANSWER KEY

SAMPLE QUESTION SAMPLE PAPER-4

CLASS -X MATHEMATICS

SECTION - 2021 -22

TERM -I

TIME : 90 Minutes Maximum Marks: 40

SECTION A

QUESTION	RIGHT ANSWER	MARKS
1	(c)	1
2	(c)	1
3	(c)	1
4	(a)	1
5	(a)	1
6	(a)	1
7	(b)	1
8	(c)	1
9	(a)	1
10	(c)	1
11	(b)	1
12	(b)	1
13	(a)	1
14	(d)	1
15	(c)	1
16	(c)	1
17	(c)	1
18	(a)	

		1
19	(d)	1
20	(c)	

SECTION B

		1
21	(b)	1
22	(d)	1
23	(b)	1
24	(d)	1
25	(b)	1
26	(c)	1
27	(a)	1
28	(c)	1
29	(d)	1
30	(c)	1
31	(a)	1
32	(b)	1
33	(c)	1
34	(c)	1
35	(a)	1
36	(d)	1
37	(a)	1
38	(a)	1
39	(c)	1
40	(d)	1

SECTION C

Case study

Q.41	(d) $x^2 + 11x + 30$	1

	(c)Both (a) and (b) are correct	1
Q.42	(d) More than 3	1
Q.43	(c)9	1
Q.44	(b) 2x + 1	1
Q.45	(i)Mid-Point Formula	1
Q.46	(iv) (3,-1)	1
Q.47	(iii)(-2,-5)	1
Q.48	(i)$\sqrt{13}$ units	1
Q.49	(iv)$\sqrt{13}$ units	1
Q.50		

ANSWER KEY

SAMPLE QUESTION PAPER -5 TERM 1

CLASS X SESSION 2021-22

SUBJECT – MATHEMATICS (BASIC)

SECTION A

Qn No	Correct Option	Hints/Solution	Marks
1	**(c)**	No of multiples of 5 between 1 and 25 = 5. Required probability = 5/25 = 1/5	1
2	**(b)**	Required area = 45°/360° x π x 14 x 14 = 77 cm2	1
3	**(b)**	(sin 45° + cos 45°) = 1/ $\sqrt{2}$ + 1/ $\sqrt{2}$ = 2/ $\sqrt{2}$ = $\sqrt{21}$	1
4	**(b)**	P (red ball) = 4/6 = 2/3	1
5	**(c)**	Since $a_1 /a_2, = b_1 /b_2, \neq c_1 /c_2,$, no solution	1
6	**(a)**	Solving the equations, x = 3, y = 2 $\Rightarrow$ x + y = 5	1
7	**(a)**	After simplification, the denominator of the given no is of the form 2^m5^n. Hence it will have a terminating decimal expansion.	1
8	**(b)**	3 $\tan^2$ A – 3 $\sec^2$ A + 1 = 1 -3($\sec^2$ A - $\tan^2$ A) = 1 – 3 = -2	1
9	**(b)**	Co-prime numbers	1
10	**(b)**	HCF x LCM = Product of the numbers, 19 x 1254 = 114 x a $\Rightarrow$ a = 209	1
11	**(a)**	LCM (p, q) = ab	1
12	**(c)**	Distance of (5,12) from the origin = $\sqrt{(5^2+12^2)}$ = 13 units	1

13 **(b)** $\Delta PXY \sim \Delta PQR$ and hence XY/QR = PX/PQ = ¼. Hence XY = ¼ QR **1**

14 **(b)** $\tan^2 A = \sec^2 A - 1 = (5/4)^2 - 1 = 9/16 \Rightarrow \tan A = 3/4$ **1**

15 **(d)** x + y = 7, 10x + y + 27 = 10y + x. Solving, x = 2 and y = 5. So the required 2 digit no = 25 **1**

16 **(a)** $\angle C = \angle F$ (corresponding parts of similar triangles) = 50° by angle sum property of triangle **1**

17 **(a)** $x^2 - 1 = 0 \Rightarrow (x+1)(x-1) = 0 \Rightarrow x = -1, 1$ **1**

18 **(d)** Required probability = 12/52 = 3/13 **1**

19 **(a)** $\sqrt{15}$. All others are rational numbers. **1**

20 **(d)** $0 = (2+x)/2 \Rightarrow x = -2$ and $0 = (3+y)/2 \Rightarrow y = -3$. So (x, y) = (-2, -3)

SECTION B

21 **(b)** Required area = $30^0/360^0 \times \pi \times 14 \times 14 = 154/3$ cm^2 **1**

22 **(b)** AB = 4BX $\Rightarrow$ BX/AB = ¼ $\Rightarrow$ BX/AX = 1/3 = YC/AY, by BPT. 1/3 = 2/AY $\Rightarrow$ AY = 6 cm **1**

23 **(b)** Required probability = 2/36 = 1/18 **1**

24 **(b)** Since the equations have infinite no of solutions, $a_1/a_2 = b_1/b_2 = c_1/c_2$, Hence 3/6 = k/-10 $\Rightarrow$ k = -5 **1**

25 **(a)** $2\pi r = \pi r^2 \Rightarrow r = 2$ units **1**

26 **(a)** $56^0/360^0 \times r^2 = 17.6 \Rightarrow r = 6$ cm **1**

27 **(b)** $(\cos\theta / \cot\theta)^2 + (\sin\theta / \tan\theta)^2 = \sin^2\theta + \cos^2\theta = 1$ **1**

28 **(b)** Minimum value of $\cos\theta$, $(0 \leq \theta \leq 90°)$ = 0 **1**

29 **(d)** $A + B = 180° - C = 90° \Rightarrow \sin(A + B) = 1$ **1**

30 **(b)** LCM (4,12, 20) = 60. Hence after 60 minutes, ie at 7 am,

they will ring together 1

31 (c) LCM (1,2,3,4,5) = 60 1

32 (b) Parallel 1

33 (d) Diagonal of a square = $\sqrt{2}$ x side = $10\sqrt{2}$ cm 1

34 (b) Intersecting at (a, b) 1

35 (b) x + y = 35, x – y = 13. Solving x = 24 and y = 11 1

36 (b) Ratio of the corresponding sides = $\sqrt{25}/\sqrt{64}$ = 5/8 1

37 (c) Since AB/BC = DE/FD, „$\angle$B = $\angle$D 1

38 (b) Thales theorem 1

39 (d) Required probability = 9/90 = 1/10 1

SECTION C

40 (c) $\pi r^2 = 154 \Rightarrow r = 7$ cm $\Rightarrow$perimeter = 44 cm 1

41 (a) Required distance=Distance between (2,4) and (5,8) = 5 units 1

42 (b) Required distance = Distance between (13, 14) and (5,8) = 10 units 1

43 (d) Coordinates of the shop = [(5+13)/2, (8+14)/2] = (9, 11) 1

44 (d) Total distance travelled = 27 units 1

45 (a) Distance between house and office = 24.6 units 1

46 (a) 2 zeroes 1

47 (c) parabola 1

48 (b) -2 and 2 1

49 (b) $(x + 2)(x - 2) = x^2 - 4$ 1

50 (c) $(-2)^2 - 4 = 0$ 1

ANSWER KEY
SAMPLE QUESTION PAPER -3
CLASS - X (BASIC MATHS)

Q. NO.	CORRECT OPTION	Q. NO.	CORRECT OPTION
1	c	31	c
2	b	32	c
3	b	33	c
4	c	34	c
5	b	35	c
6	a	36	c
7	c	37	a
8	d	38	d
9	a	39	a
10	d	40	b
11	b	41	b
12	a	42	b
13	c	43	c
14	b	44	a
15	c	45	d
16	d	46	d
17	d	47	c
18	d	48	c
19	d	49	b
20	c	50	b
21	d		
22	c		
23	c		
24	c		
25	b		
26	b		
27	d		
28	c		
29	c		
30	d		

ANSWER KEY
SAMPLE QUESTION PAPER-2
(MATHEMATICS TERM 1)

Q. No.	Answer	Q. No.	Answer
1	b	26	a
2	d	27	c
3	d	28	b
4	c	29	b
5	d	30	d
6	d	31	a
7	b	32	b
8	c	33	b
9	b	34	d
10	d	35	a
11	c	36	d
12	a	37	d
13	b	38	c
14	b	39	d
15	b	40	b
16	d	41	d
17	a	42	a
18	b	43	b
19	a	44	c
20	d	45	c
21	b	46	c
22	a	47	b
23	d	48	d
24	d	49	a
25	a	50	b

ANSWER KEY

SAMPLE QUESTION PAPER -5 TERM 1

CLASS X SESSION 2021-22

SUBJECT – MATHEMATICS (STANDARD)

SECTION A

Qn No	Correct Option	Hints/Solution	Marks
1	(d)	Least composite number is 4 and the least prime number is 2. LCM(4,2) = 4	1
2	(a)	7(10x+y) = 4(10y+x) and y-x = 3. Solving,. x = 3, y = 6. So 2-digit no is 36.	1
3	(b)	By Pythagoras theorem, required distance = $\sqrt{}$(200² + 150²) = 250 m	1
4	(c)	BC:BD = 2:1. Hence ratio of the areas of similar triangles = 4:1	1
5	(d)	Required probability = 2/7	1
6	(c)	Let AB/PQ = BC/QR = AC/PR = k. Then k(PQ+QR+PR) = 60 and (PQ+QR+PR) = 60. Hence k = 60/36 = 5/3 and AB = 5/3 of 9 = 15 cm	1
7	(c)	sin 30° = AB/AC, ½ = 5/AC, hence AC = 10 cm	1
8	(a)	Required number = HCF of (70-5), (125-8) = HCF of 65 and 117 = 13	1
9	(c)	Solving the given equations, x = 0.5 and y = 0.5	1
10	(c)	Since AB = BC = CD = AD and AC = BD, ABCD is a square	1

11 **(a)** After simplification, the given no is of the form p/q where $q = 2^m5^n$. Hence it has a terminating decimal expansion. 1

12 **(d)** HCF (66, 88, 110) = 22. Hence no of minimum rows required = 66/22 + 88/22 + 110/22 = 3+4+5 = 12 1

13 **(d)** Since OA = OC and OB = OD (radii) and $\angle AOC = \angle BOD$. Hence the triangles are isosceles and similar. 1

14 **(d)** Ratio of the areas of similar triangles = $(2/3)^2 = 4/9$. Then area of the larger triangle = 9/4 of 48 = 108 sq cm 1

15 **(b)** tan A = 1 means A = 45°. Hence 2 sin A cos A = $2x\ (1/\sqrt{2})\ x\ (1/\sqrt{2}) = 1$ 1

16 **(c)** $30°/\ 360° \times 2\pi r = 8.8 \Rightarrow r = 16.8$ cm = length of the pendulum 1

17 **(c)** Since $AB^2 + BC^2 = AC^2$, angle B = 90° (By converse of Pythagoras theorem) 1

18 **(a)** $\sin A = 1 - \sin^2 A = \cos^2 A \Rightarrow \cos^2 A + \cos^4 A = \sin A + \sin^2 A = 1$ 1

19 **(a)** Since (6, k) is a solution of the equation 3x+y- 22 = 0, 3x6+k -22 = 0, k = 4 1

20 **(d)** No of multiples of 3 between 1 and 50 = 16, so required probability = 16/ 50 = 8/25 1

SECTION B

21 **(c)** After 3 decimal places, the decimal representation will terminate 1

22 **(c)** 6(x + y) + 4 = 10x + y and 10x + y -18 = 10y + x $\Rightarrow$ x = 6, y = 4. So required no = 64 1

23 (c) $\tan A = \sqrt{3} \Rightarrow A = 60°$ 1

24 (d) Given equations have no solution 1

25 (c) LCM (18,24,32) = 288. Hence required number = 288 x 4 = 1152 1

26 (b) Required probability = P (white ball) = 2/ 9 1

27 (c) Required probability = 3/8 1

28 (d) (1 +sin A/cos A + 1/cos A) (1 + cos A/sin A – 1/sin A) = [(cos A + sin A)^2 – 1]/cos A sin A = 2sin A cos A/cos A sin A = 2 1

29 (b) Since P is the midpoint, 1 = [b + (b+4)]/2 $\Rightarrow$ b = -1 1

30 (c) $\angle B = \angle D = 75°$, by angle sum property of a triangle 1

31 (a) By applying distance formula, 16 + (p -3)^2 $\Rightarrow$25, solving p = 6 1

32 (a) A = 90° , so sin A = 1 and hence cos B = 1 $\Rightarrow$ B = 0° 1

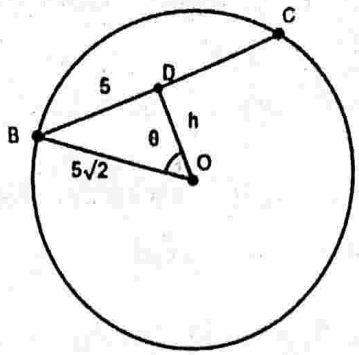
33 (c) (3 + $\sqrt{7}$) (3 – $\sqrt{7}$) = 9 – 7 = 2; which is not irrational 1

34 (b) Ratio of corresponding sides of congruent triangles = 1:1 1

35 (d) Centroid = [(0+8+8)/3, (6+12+0)/3] = (16/3, 6) 1

36 (a) $\pi r+2r = 36 \Rightarrow r(\pi+2) = 36 \Rightarrow r$ = 14 cm 1

37 (c)



$\sin\theta$, = $1/\sqrt{2} \Rightarrow$,$\theta = 45° \Rightarrow \angle BOC = 90°$ Area of the required segment = Area of the sector – Area of the triangle = 90° /360° x π x $(5\sqrt{2})^2$ – ½ x 10 x 5 = 14.25 cm^2 1

38 **(b)** $(-4)^2 - (-4) - (2k+2) = 0 \Rightarrow k = 9$ 1

39 **(b)** $2\pi r = 88 \Rightarrow r = 14$ cm $\Rightarrow$ area of the sector = 72° / 360° x π x 14 x 14 = 123.2 cm^2 1

40 **(b)** Solving the equations, x = 2 and y = 3 1

SECTION C

41 **(b)** No of zeroes = 3 1

42 **(c)** Zeroes are -5.5, -2 and 2 1

43 **(b)** Required quadratic polynomial = (x-3) (x+4) = x^2+x-12 1

44 **(b)** Since there are 3 zeroes, the graph is of a cubic polynomial. 1

45 **(a)** $x^2 - 2x - 3 = (x-3)(x+1)$. So, another zero = 3 1

46 **(a)** D = (3,4) 1

47 **(c)** M = (5,5/2) 1

48 **(b)** AB = 6 units from the graph 1

49 **(a)** AD = Distance between (1,1) and (3,4) = $\sqrt{13}$ units 1

50 **(a)** If A is taken as origin, coordinates of M = (4,3/2) 1