Sample/Pre-Board Paper 35

Class X Term 1 Exam Nov -Dec 2021

Mathematics (Standard) 041

Time Allowed: 90 minutes Maximum 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. The sum of exponents of prime factors in the prime-factorisation of 196 is

(a) 3 (b) 4

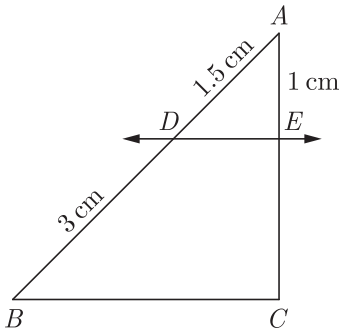
(c) 5 (d) 2

2. If one zero of the polynomial $2x^2+3x+\lambda$ is $\frac{1}{2}$, what is the value of λ and the other zero?

(a) –2 and –2 (b) –3 and –3

(c) –2 and –3 (d) –3 and –2

3. In the given figure, $DE \parallel BC$. The value of EC is



(a) 1.5 cm (b) 3 cm

(c) 2 cm (d) 1 cm

4. It is given that $\Delta ABC \sim \Delta PQR$ with $\frac{BC}{QR}=\frac{1}{4}$. Then $\frac{\text{ar}(\Delta PRQ)}{\text{ar}(\Delta BCA)}$ is equal to

(a) 16 (b) 3

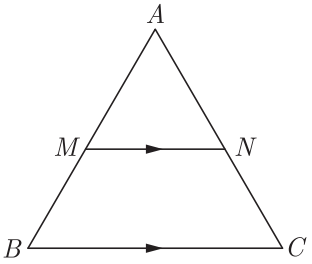
(c) $\frac{1}{4}$ (d) $\frac{1}{16}$

5. The probability that a number selected at random from the numbers 1, 2, 3, ..., 15 is a multiple of 4 is

(a) $\frac{4}{15}$ (b) $\frac{2}{15}$

(c) $\frac{1}{15}$ (d) $\frac{1}{5}$

6. In figure, $MN \parallel BC$ and $AM:MB=1:2$, then $\frac{ar(\Delta AMN)}{ar(\Delta ABC)}=$ .....



(a) $\frac{1}{3}$ (b) $\frac{1}{9}$

(c) $\frac{8}{9}$ (d) $\frac{5}{9}$

7. Given that $\sin\alpha=\frac{\sqrt{3}}{2}$ and $\cos\beta=0$, then the value of $\beta-\alpha$ is

(a) 0° (b) 90°

(c) 60° (d) 30°

8. Which of the following rational number have non-terminating repeating decimal expansion?

(a) $\frac{31}{3125}$ (b) $\frac{71}{512}$

(c) $\frac{23}{200}$ (d) None of these

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

(a) $-\frac{14}{3}$ (b) $\frac{2}{5}$

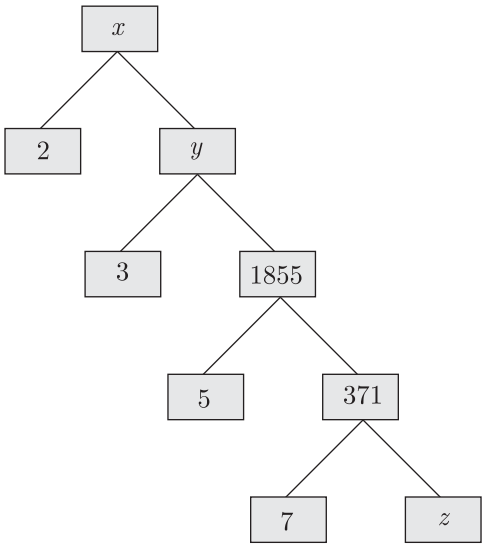
(c) 5 (d) 10

10. The point P on x-axis equidistant from the points $A(-1,0)$ and $B(5,0)$ is

(a) (2, 0) (b) (0, 2)

(c) (3, 0) (d) $(-3,5)$

11. In the given factor tree what is the composite number x?



(a) 53 (b) 11130

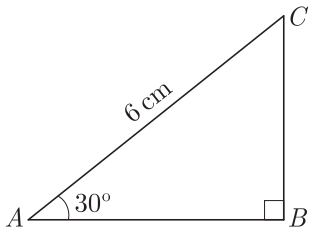
(c) 5565 (d) 19438

12. What are the HCF and LCM of 90 and 144 by the method of prime factorization.

(a) 36 and 360 (b) 720 and 18

(c) 18 and 720 (d) 360 and 36

13. In the adjoining figure, the length of BC is



(a) $2\sqrt{3}$ cm (b) $3\sqrt{3}$ cm

(c) $4\sqrt{3}$ cm (d) 3 cm

14. The value of $(1+\tan^2\theta)(1-\sin\theta)(1+\sin\theta) =$ ..... .

(a) 0 (b) 1

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

15. The radius of a circle is 17.5 cm. What is the area of the sector of the circle enclosed by two radii and an arc 44 cm in length ?

(a) 190 sq cm (b) 770 sq cm

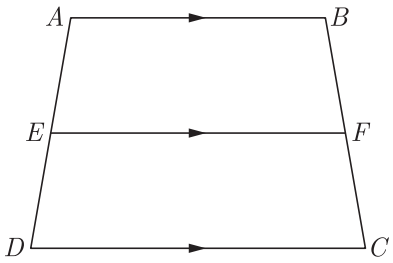
(c) 385 sq cm (d) 225 sq cm

16. If triangle ABC is similar to triangle DEF such that $2AB = DE$ and $BC = 8$ cm then EF will be

(a) 16 cm (b) 14 cm

(c) 12 cm (d) 10 cm

17. In the given figure, if $ABCD$ is a trapezium in which $AB \,||\, CD \,||\, EF$, then $\frac{AE}{ED} = ?$



(a) $\frac{2FC}{BF}$ (b) $\frac{2BF}{FC}$

(c) $\frac{FC}{BF}$ (d) $\frac{BF}{FC}$

18. If $k+1 = \sec^2\theta(1+\sin\theta)(1-\sin\theta)$, then the value of k. will be

(a) 0 (b) 1

(c) 2 (d) 15

19. If a pair of linear equations is consistent, then the lines will be

(a) parallel

(b) always coincident

(c) intersecting or coincident

(d) always intersecting

20. A girl calculates that the probability of her winning the first prize in a lottery is 0.08. If 6000 tickets are sold, then how many tickets has she bought?

(a) 40

(b) 240

(c) 480

(d) 750

SECTION B

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

21. A tile floor is to be made from 10 inch, 12 inch, and 15 inch square tiles. A design is made by alternating rows with different size tiles. The first row uses only 10 inch tiles, the second row uses only 12 inch tiles, and the third row uses only 15 inch tiles. Neglecting the grout seams, what is the shortest length of floor space that can be covered evenly by each row?

(a) 20 inch (b) 39 inch

(c) 60 inch (d) 10 inch

22. The mid-point of the line-segment AB is $P(0,4)$, if the coordinates of B are $(-2,\ 3)$ then the co-ordinates of A are

(a) $(2,\ 5)$ (b) $(-2,-5)$

(c) $(2,\ 9)$ (d) $(-2,11)$

23. If $\frac{\cos\theta}{1-\sin\theta}+\frac{\cos\theta}{1+\sin\theta}=4;\theta\leq 90^{\circ}$ the value of θ will be

(a) 30° (b) 45°

(c) 60° (d) 90°

24. If the equations $kx-2y=3$ and $3x+y=5$ represent two intersecting lines at unique point, then the value of k is ..... .

(a) $k=-6$ (b) $k\neq -6$

(c) $k=4$ (d) $k\neq 4$

25. If one zero of a quadratic polynomial (kx^2+3x+k) is 2, then the value of k is

(a) $\frac{5}{6}$ (b) $-\frac{5}{6}$

(c) $\frac{6}{5}$ (d) $-\frac{6}{5}$

26. If in a lottery, there are 5 prizes and 20 blanks, then the probability of getting a prize is

(a) $\frac{2}{5}$ (b) $\frac{4}{5}$

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

27. A number is chosen at random from the numbers -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5. Then the probability that square of this number is less than or equal to 1 is ..... .

(a) $\frac{9}{11}$ (b) $\frac{3}{11}$

(c) $\frac{8}{11}$ (d) $\frac{7}{11}$

28. Four equal circles are described at the four corners of a square so that each touches two of the others. The shaded area enclosed between the circle is $\frac{24}{7}$ cm^2. What is the radius of each circle?

(a) 2 cm (b) 4 cm

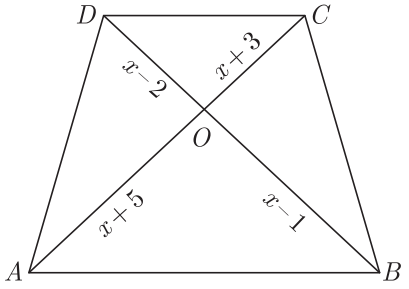
(c) 6 cm (d) 1 cm

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

(a) 2 (b) 4

(c) 6 (d) 8

30. In the given figure, if $AB\,||\,DC$, the value of x will be



(a) 3 (b) 6

(c) 7 (d) 8

31. The points (a,a), $(-a,-a)$ and $\left(-\sqrt{3}\,a,\sqrt{3}\,a\right)$ are the vertices of_____

(a) equilateral triangle

(b) scalene triangle

(c) isosceles triangle

(d) right angled isosceles triangle

32. $\sin A$ is equal to

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

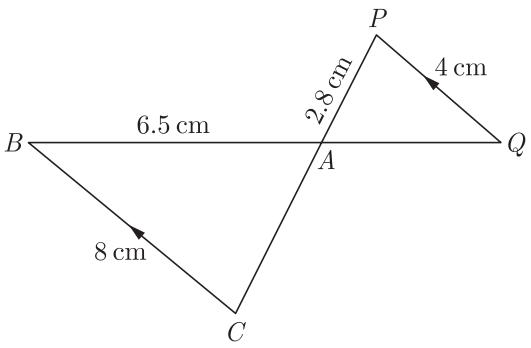
(c) $\frac{\sec A}{\sqrt{\sec^2 A-1}}$ (d) $\frac{\sqrt{\sec^2 A-1}}{\sec A}$

33. 144 cartons of Coke cans and 90 cartons of Pepsi cans are to be stacked in a canteen. If each stack is of the same height and if it equal contain cartons of the same drink, what would be the greatest number of cartons each stack would have?

(a) 12 (b) 24

(c) 18 (d) 36

34. In the given figure, $BC\,||\,PQ$ and $BC=8$ cm, $PQ=4$ cm, $BA=6.5$ cm $AP=2.8$ cm.
The length of CA is



(a) 2.80 cm (b) 5.60 cm

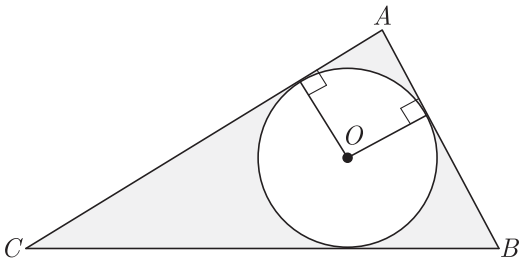
(c) 3.25 cm (d) 2.10 cm

35. The perpendicular bisector of the line segment joining the points $A(1,5)$ and $B(4,6)$ cuts the y-axis at

(a) (0, 13) (b) $(0,-13)$

(c) (0, 12) (d) (13, 0)

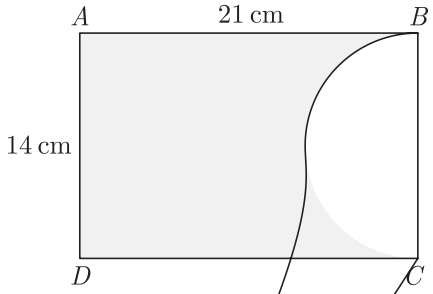
36. In the figure, ABC is a right angled triangle right angled at $\angle A$. if $AB=6$ cm, $BC=10$ cm and O is the centre of the circle of the triangle ABC, what is the area of the shaded region ?



(a) 22.6 cm^2 (b) 18.9 cm^2

(c) 11.5 cm^2 (d) 11.43 cm^2

37. In the given figure, $ABCD$ is a rectangle of dimensions 21 cm $\times$ 14 cm. A semicircle is drawn with BC as diameter. What is the area and the perimeter of the shaded region in the figure?



(a) 217 cm^2 (b) 434 cm^2

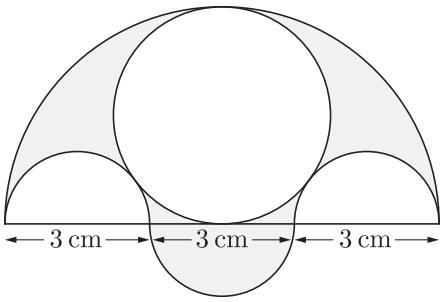
(c) 314 cm^2 (d) 506 cm^2

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

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

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

39. Three semicircles each of diameter 3 cm, a circle of diameter 4.5 cm and a semicircle of radius 4.5 cm are drawn in the given figure. The area of the shaded region will be



(a) 25.6 cm^2 (b) 50.6 cm^2

(c) 12.375 cm^2 (d) 28.375 cm^2

40. Given the linear equation $3x+4y=9$. Select another linear equation in these two variables such that the geometrical representation of the pair so formed is intersecting lines.

(a) $3x-5y=10$ (b) $6x+8y=18$

(c) $8x+12y=18$ (d) above all

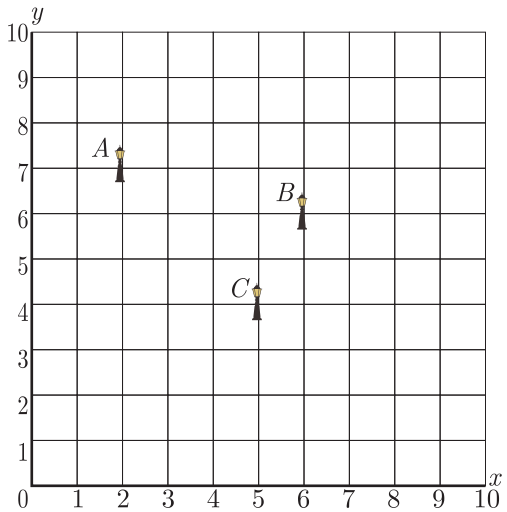
SECTION C

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

Case Based Questions: (41-45)

Resident Welfare Association (RWA) of a Gulmohar Society in Delhi have installed three electric poles A, B and C in a society's common park. Despite these three poles, some parts of the park are still in dark. So, RWA decides to have one more electric pole D in the park.

The park can be modelled as a coordinate systems given below.



On the basis of the above information, answer any four of the following questions:

41. What is the position of the pole C?

(a) (4 ,5) (b) (5, 4)

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

42. What is the distance of the pole B from the corner O of the park ?

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

(c) $6\sqrt{3}$ units (d) $3\sqrt{3}$ units

43. Find the position of the fourth pole D so that four points A, B C and D form a parallelogram .

(a) (5, 2) (b) (1, 5)

(c) (1, 4) (d) (2, 5)

44. What is the distance between poles A and C ?

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

(c) $6\sqrt{3}$ units (d) $3\sqrt{3}$ units

45. What is the distance between poles B and D?

(a) $2\sqrt{3}$ units (b) $\sqrt{28}$ units

(c) $6\sqrt{3}$ units (d) $\sqrt{26}$ units

Case Based Questions: (46-50)

Underground water tank is very popular in India. It is usually used for large water tank storage and can be built cheaply using cement-like materials. Underground water tank are typically chosen by people who want to save space. The water in the underground water tank is not affected by extreme weather conditions. The underground water tank maintain cool temperatures in both winter and summer.

A builder wants to build a tank to store water in an apartment. The volume of the rectangular tank will be modelled by $V(x) = x^3 + x^2 - 4x - 4$.

46. He planned in such a way that its base dimensions are $(x+1)$ and $(x+2)$. How much he has to dig ?

(a) $(x+1)$ (b) $(x-2)$

(c) $(x-3)$ (d) $(x+2)$

47. If $x = 4$ meter, what is the volume of the water tank?

(a) 30 m^3 (b) 20 m^3

(c) 15 m^3 (d) 60 m^3

48. If $x = 4$ and the builder wants to paint the entire inner portion on the water tank, what is the total area to be painted ?

(a) 52 m^2 (b) 96 m^2

(c) 208 m^2 (d) 104 m^2

49. If the cost of paint is ₹ 25/ per square metre, what is the cost of painting ?

(a) ₹ 3900 (b) ₹ 2600

(c) ₹ 1300 (d) ₹ 5200

50. What is the storage capacity of this water tank ?

(a) 3000 litre (b) 6000 litre

(c) 60000 litre (d) 30000 litre

SAMPLE PAPER - 30 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(b)	Ch-1	1
2	(a)	Ch-2	S-12
3	(c)	Ch-4	1
4	(a)	Ch-4	12
5	(d)	Ch-8	1
6	(b)	Ch-4	25
7	(d)	Ch-6	1
8	(d)	Ch-1	21
9	(d)	Ch-3	1
10	(a)	Ch-5	1
11	(b)	Ch-1	36
12	(c)	Ch-1	S-17
13	(d)	Ch-6	13
14	(b)	Ch-6	29
15	(c)	Ch-7	29
16	(a)	Ch-4	35
17	(d)	Ch-4	45
18	(a)	Ch-6	42
19	(c)	Ch-3	12
20	(c)	Ch-8	13
21	(c)	Ch-1	53
22	(a)	Ch-5	11
23	(c)	Ch-6	60
24	(b)	Ch-3	24
25	(d)	Ch-2	1

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(c)	Ch-8	23
27	(b)	Ch-8	33
28	(a)	Ch-6	74
29	(d)	Ch-5	22
30	(c)	Ch-4	56
31	(a)	Ch-5	46
32	(d)	Ch-6	86
33	(c)	Ch-1	S-27
34	(b)	Ch-4	D-67
35	(a)	Ch-5	33
36	(d)	Ch-7	82
37	(a)	Ch-7	92
38	(d)	Ch-2	16
39	(c)	Ch-7	102
40	(a)	Ch-3	34
41	(b)	Ch-5	112
42	(a)	Ch-5	113
43	(b)	Ch-5	114
44	(b)	Ch-5	115
45	(d)	Ch-5	116
46	(b)	Ch-2	104
47	(d)	Ch-2	105
48	(d)	Ch-2	106
49	(b)	Ch-2	107
50	(c)	Ch-2	108

*** S- = Self Test Question, * D- = Direction Based Question**