Sample/Pre-Board Paper 34

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 total number of factors of prime number is

(a) 1 (b) 0

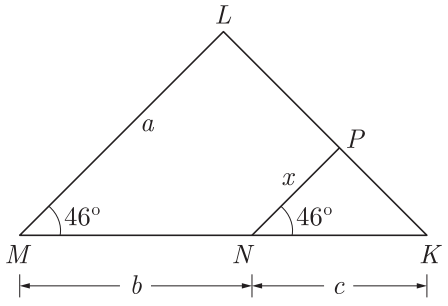
(c) 2 (d) 3

2. If α and β are the zeroes the polynomial $2x^2 - 4x + 5$, the value of $\alpha^2 + \beta^2$ is

(a) 2 (b) 1

(c) -1 (d) -6

3. In the given figure, x is



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

(c) $\frac{bc}{b+c}$ (d) $\frac{ac}{a+c}$

4. If $\Delta ABC \sim \Delta APQ$ and $\text{ar}(\Delta APQ) = 4\text{ar}(\Delta ABC)$, ar (ΔABC), then the ratio of BC to PQ is

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

(c) 1 : 4 (d) 4 : 1

5. Two coins are tossed simultaneously. The probability of getting at most one head is

(a) $\frac{1}{4}$ (b) $\frac{1}{2}$

(c) $\frac{2}{3}$ (d) $\frac{3}{4}$

6. The corresponding sides of two similar triangles are in the ratio 3 : 4, then the ratio of the areas of triangles is .....

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

(c) $\frac{9}{16}$ (d) $\frac{3}{4}$

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

(a) 0 (b) 1

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

8. If $x = 0.\overline{7}$, then $2x$ is

(a) $1.\overline{4}$ (b) $1.\overline{5}$

(c) $1.\overline{54}$ (d) $1.\overline{45}$

9. The value of k for which the system of equations $x + y - 4 = 0$ and $2x + ky = 3$, has no solution, is

(a) -2 (b) $\neq 2$

(c) 3 (d) 2

10. If the point P (6, 2) divides the line segment joining $A(6, 5)$ and $B(4, y)$ in the ratio 3:1 then the value of y is

(a) 4 (b) 3

(c) 2 (d) 1

11. The HCF and LCM of 378, 180 and 420 of will be

(a) 6 and 3980 (b) 12 and 3780

(c) 6 and 3780 (d) 12 and 3980

12. Given that HCF (306, 1314) = 18. What is the LCM (306, 1314)

(a) 22338 (b) 11164

(c) 16146 (d) 19248

13. If $b\tan\theta = a$, the value of $\frac{a\sin\theta - b\cos\theta}{a\sin\theta + b\cos\theta}$ is

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

(c) $\frac{a^2+b^2}{a^2-b^2}$ (d) $\frac{a^2-b^2}{a^2+b^2}$

14. If $\tan A = \cot B$, then the value of $(A+B)$ is

(a) $90°$ (b) $120°$

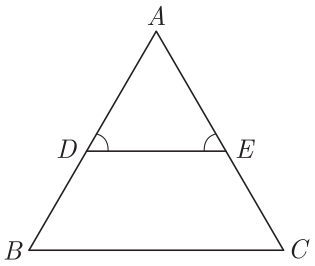
(c) $60°$ (d) $180°$

15. What is the area of the sector of a circle of radius 6 cm whose central angle is $30°$? (Take $\pi = 3.14$)

(a) $9.42\,\text{cm}^2$ (b) $18.84\,\text{cm}^2$

(c) $6.32\,\text{cm}^2$ (d) $12.64\,\text{cm}^2$

16. In Figure $\angle D = \angle E$ and $\frac{AD}{DB} = \frac{AE}{EC}$, then ΔBAC is



(a) isosceles triangle (b) scalene triangle

(c) equilateral triangle (d) right angle triangle

17. In a rectangle $ABCD, E$ is a point on AB such that $AE = \frac{2}{3}AB$. If $AB = 6$ km and $AD = 3$ km, then length of DE. will be

(a) 2 km (b) 3 km

(c) 4 km (d) 5 km

18. $\frac{\sin A - 2\sin^3 A}{2\cos^3 A - \cos A} = ?$

(a) $\sin A$ (b) $\tan A$

(c) $\cos A$ (d) $\cot A$

19. The pair of equations $y = 0$ and $y = -7$ has

(a) one solution

(b) two solutions

(c) infinitely many solutions

(d) no solution

20. 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

(a) $\frac{1}{5}$ (b) $\frac{3}{5}$

(c) $\frac{4}{5}$ (d) $\frac{1}{3}$

SECTION B

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

21. A patient admitted to the Jaipur Golden hospital was prescribed a pain medication to be given every 4 hr and an antibiotic to be given every 5 hr. Bandages applied to the patient's external injuries needed changing every 12 hr. The nurse changed the bandages and gave the patient both medications at 6:00 A.M. Monday morning.

How many hours will pass before the patient is given both medications and has his bandages changed at the same time?

(a) 60 hours (b) 40 hours

(c) 20 hours (d) 90 hours

22. x-axis divides the line segment joining $A(2,-3)$ and $B(5,6)$ in the ratio

(a) 2 : 3 (b) 3 : 5

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

23. $\sqrt{\frac{1-\cos A}{1+\cos A}} = ?$

(a) $1+\cos A$ (b) $\text{cosec}\,A + \cot A$

(c) $\text{cosec}\,A - \cot A$ (d) $1 - \cos A$

24. What do you say about the solution of the pair of linear equations $y = 0$ and $y = -5$?

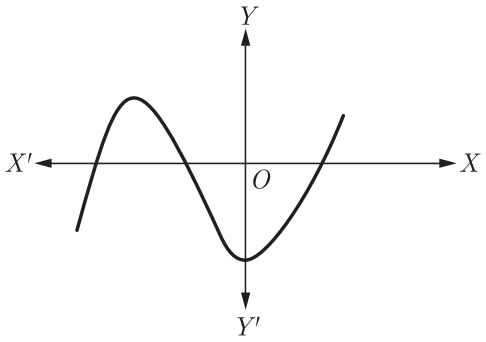
(a) no solution

(b) unique solution

(c) infinitely solution

(d) can't say anything

25. The graph of a polynomial is shown in Figure, then the number of its zeroes is



(a) 3 (b) 1

(c) 2 (d) 4

26. If a number x is chosen at random from the numbers $-2, -1, 0, 1, 2$. Then, the probability that $x^2 < 2$ is

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

(c) $\frac{1}{5}$ (d) $\frac{3}{5}$

27. What is the probability of an impossible event?

(a) ∞ (b) 1

(c) 0 (d) 0.5

28. If $b\cos\theta = a$, then $\operatorname{cosec}\theta + \cot\theta = ?$

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

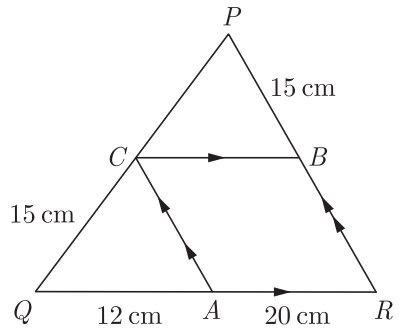
(c) $\sqrt{\frac{a-b}{2ab}}$ (d) $\sqrt{\frac{b-a}{b+a}}$

29. The centroid of the triangle whose vertices are $(3, -7)$, $(-8, 6)$ and (5, 10) is

(a) (0, 9) (b) (0, 3)

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

30. In the given figure below, $CB \,||\, QR$ and $CA \,||\, PR$. Also $AQ = 12$ cm, $AR = 20$ cm, $PB = CQ = 15$ cm. Calculate PC and BR.



The length PC is

(a) 15 cm (b) 25 cm

(c) 12 cm (d) 9 cm

31. If $A(4,3)$, $B(-1, y)$, and $C(3,4)$ are the vertices of a right triangle ABC, right angled at A, then the value of y will be

(a) –8 (b) –6

(c) –2 (d) –4

32. If $\sin\theta + \cos\theta = \sqrt{2}$, then $\tan\theta + \cot\theta = ?$

(a) 1 (b) 2

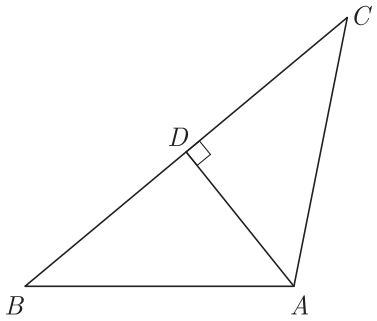
(c) $2\sqrt{2}$ (d) $2\sqrt{3}$

33. If $a = 2^3 \times 3$, $b = 2 \times 3 \times 5$, $c = 3^n \times 5$ and $\text{LCM}(a, b, c) = 2^3 \times 3^2 \times 5$, then n is

(a) 1 (b) 2

(c) 3 (d) 4

34. In the given figure, if $AD \perp BC$, the term $AB^2 + CD^2$ is equal to



(a) $2BD^2 + 3AC^2$ (b) $\frac{1}{2}BD^2 + AC^2$

(c) $BD^2 + \frac{1}{2}AC^2$ (d) $BD^2 + AC^2$

35. If the distance between the points $(4, p)$ and (1, 0) is 5, then the value of p is

(a) 4 only (b) ± 4

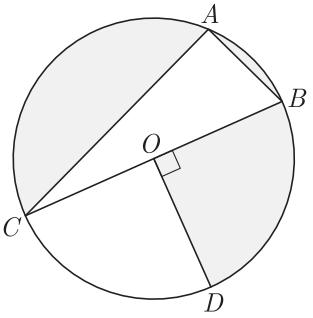
(c) -4 only (d) 0

36. Two circular beads of different sizes are joined together such that the distance between their centres is 14 cm. If sum of their areas is 130π cm^2, what is the radius of each bead?

(a) 2 cm (b) 3 cm

(c) 4 cm (d) 5 cm

37. In the given figure, O is the centre of the circle with $AC = 24$ cm, $AB = 7$ cm and $\angle BOD = 90^\circ$. What is the area of the shaded region?



(a) 185 cm^2 (b) 284 cm^2

(c) 105 cm^2 (d) 198 cm^2

38. If the zeroes of the quadratic polynomial $ax^2 + bx + c$, where $c \neq 0$, are equal, then

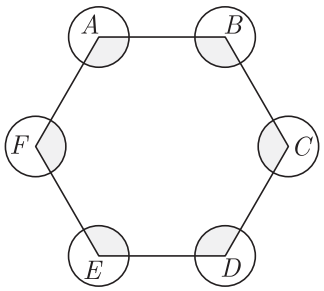
(a) c and a have opposite signs

(b) c and b have opposite signs

(c) c and a have same sign

(d) c and b have the same sign

39. In fig., $ABCDEF$ is any regular hexagon with different vertices A, B, C, D, E and F as the centres of circle with same radius r are drawn. What is the area of the shaded portion?



(a) πr^2

(b) $2\pi r^2$

(c) $4\pi r^2$

(d) $8\pi r^2$

40. For what value of p does the pair of linear equations given below has unique solution ?
$4x + py + 8 = 0$ and $2x + 2y + 2 = 0$.

(a) $p = 1$

(b) $p = 2$

(c) $p \neq 4$

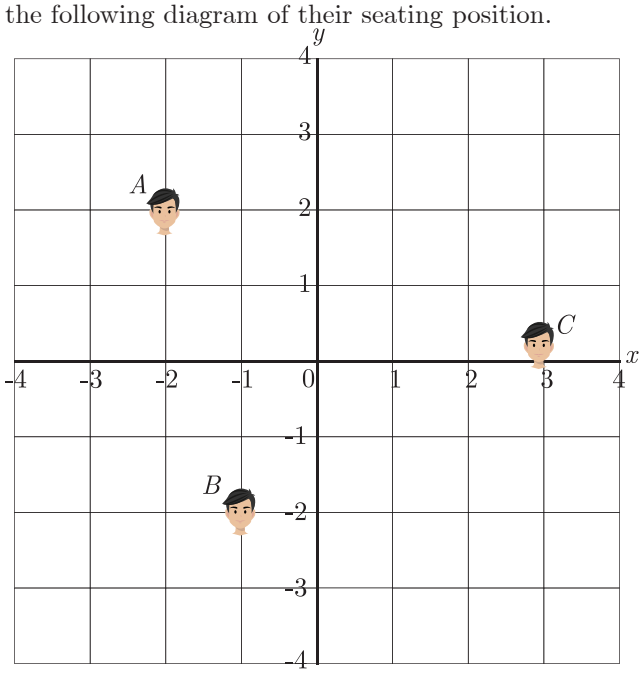
(d) $p \neq 2$

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)

Ajay, Bhigu and Colin are fast friend since childhood. They always want to sit in a row in the classroom . But teacher doesn't allow them and rotate the seats row-wise everyday. Bhigu is very good in maths and he does distance calculation everyday. He consider the centre of class as origin and marks their position on a paper in a co-ordinate system. One day Bhigu make the following diagram of their seating position.



41. What are the coordinates of point A?

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

(c) $(-2, 2)$ (d) $(-2, -2)$

42. What is the distance of point A from origin ?

(a) 8 (b) $2\sqrt{2}$

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

43. What is the distance between A and B ?

(a) $3\sqrt{19}$ (b) $3\sqrt{5}$

(c) $\sqrt{17}$ (d) $2\sqrt{5}$

44. What is the distance between B and C ?

(a) $3\sqrt{19}$ (b) $3\sqrt{5}$

(c) $2\sqrt{17}$ (d) $2\sqrt{5}$

45. A point D lies on the line segment between points A and B such that $AD : DB = 4 : 3$. What are the the coordinates of point D ?

(a) $\left(\frac{10}{7}, \frac{2}{7}\right)$

(b) $\left(\frac{2}{7}, \frac{7}{7}\right)$

(c) $\left(-\frac{10}{7}, -\frac{2}{7}\right)$

(d) $\left(-\frac{2}{7}, -\frac{7}{7}\right)$

Case Based Questions: (46-50)

Pyramid, in architecture, a monumental structure constructed of or faced with stone or brick and having a rectangular base and four sloping triangular sides meeting at an apex. Pyramids have been built at various times in Egypt, Sudan, Ethiopia, western Asia, Greece, Cyprus, Italy, India, Thailand, Mexico, South America, and on some islands of the Pacific Ocean. Those of Egypt and of Central and South America are the best known.

The volume and surface area of a pyramid with a square base of area a^2 and height h is given by

$$V = \frac{ha^2}{3} \text{ and } S = a^2 + 2a\sqrt{\left(\frac{a}{2}\right)^2 + h^2}$$

A pyramid has a square base and a volume of $3y^3 + 18y^2 + 27y$ cubic units.

46. If its height is y, then what polynomial represents the length of a side of the square base ?

(a) $9(y+3)$ (b) $9(y+3)^2$

(c) $3(y+3)$ (d) $3(y+3)^2$

47. If area of base is 576 metre, what is the side of base?

(a) 24 metre (b) 16 metre

(c) 13 metre (d) 12 metre

48. What is the height of pyramid at above area of base ?

(a) 4 metre (b) 6 metre

(c) 5 metre (d) 12 metre

49. What is the ratio of length of side to the height ?

(a) $\frac{1}{5}$ (b) $\frac{2}{5}$

(c) $\frac{5}{24}$ (d) $\frac{24}{5}$

50. What is surface area of pyramid ?

(a) 800 m^2 (b) 2400 m^2

(c) 1200 m^2 (d) 1600 m^2

SAMPLE PAPER - 29 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(c)	Ch-1	2
2	(c)	Ch-2	S-11
3	(b)	Ch-4	2
4	(b)	Ch-4	13
5	(d)	Ch-8	2
6	(c)	Ch-4	26
7	(d)	Ch-6	2
8	(b)	Ch-1	20
9	(d)	Ch-3	2
10	(d)	Ch-5	2
11	(c)	Ch-1	35
12	(a)	Ch-1	S-18
13	(d)	Ch-6	15
14	(a)	Ch-6	31
15	(a)	Ch-7	30
16	(a)	Ch-4	36
17	(d)	Ch-4	46
18	(b)	Ch-6	45
19	(d)	Ch-3	13
20	(a)	Ch-8	14
21	(a)	Ch-1	D-51
22	(c)	Ch-5	12
23	(c)	Ch-6	61
24	(a)	Ch-3	25
25	(a)	Ch-2	2

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(d)	Ch-8	24
27	(c)	Ch-8	24
28	(b)	Ch-6	75
29	(b)	Ch-5	23
30	(b)	Ch-4	D-57
31	(c)	Ch-5	47
32	(b)	Ch-6	89
33	(b)	Ch-1	S-7
34	(d)	Ch-4	69
35	(b)	Ch-5	34
36	(b)	Ch-7	80
37	(b)	Ch-7	91
38	(c)	Ch-2	19
39	(b)	Ch-7	101
40	(c)	Ch-3	35
41	(c)	Ch-5	117
42	(b)	Ch-5	118
43	(c)	Ch-5	119
44	(d)	Ch-5	120
45	(c)	Ch-5	121
46	(c)	Ch-2	99
47	(a)	Ch-2	100
48	(c)	Ch-2	101
49	(d)	Ch-2	102
50	(c)	Ch-2	103

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