### Sample/Pre-Board Paper 24

### Class X Term 1 Exam Nov -Dec 2021

# Mathematics (Standard) 041

## Time Allowed: 90 minutes Maximum Marks: 40

### **General Instructions:**

- The question paper contains three parts A, B and C. 1
- 2 Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.
- Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted. 3.
- 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.

- The sum of exponents of prime factors in the prime-1. factorisation of 196 is
  - (a) 3 (b) 4
  - (c) 5 (d) 2
- 2. 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
- In given figure  $\triangle ABC \sim \triangle DEF$ . AP bisects  $\angle CAB$ 3. and DQ bisects  $\angle FDE$ .



Consider the following statement: (1)  $\frac{AP}{DQ} = \frac{AB}{DE}$ 

- (2)  $\Delta CAP \sim \Delta FDQ$

Which of the above are correct statement?

(a) only 1 (b) only 2

- (c) both 1 and 2(d) none
- 4. A ladder 10 m long reaches a window 8 m above the ground. The distance of the foot of the ladder from the base of the wall is ..... m.

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

- 5. A card is drawn at random from a well-shuffled pack of 52 cards. What is the probability of getting a red king?
  - (a)  $\frac{1}{13}$ (b)  $\frac{1}{26}$ (c)  $\frac{3}{26}$ (d)  $\frac{1}{52}$
- 6. In an equilateral triangle of side  $3\sqrt{3}$  cm the length of the altitude will be
  - (a) 6.5 cm (b) 5.5 cm
  - (c) 4.5 cm (d) 7.5 cm
- The value of the  $(\tan^2 60^\circ + \sin^2 45^\circ)$  is ...... 7.
  - (a)  $\frac{1}{2}$ (b)  $\frac{3}{2}$
  - (c) 1 (d)  $\frac{7}{2}$

Which of the following is the HCF of  $3^3 \times 5$  and  $3^2 \times 5^2$ .

- (a) 15 (b) 30 (d) 90 (c) 45
- 9. If the lines given by 3x + 2ky = 2 and 2x + 5y + 1 = 0are parallel, then the value of k is
  - (a)  $-\frac{5}{4}$ (b)  $\frac{2}{5}$ (d)  $\frac{3}{2}$ (c)  $\frac{15}{4}$
- 10. If the distance between the points (4, p) and (1, 0) is 5, then the value of p is
  - (a) 4 only (b)  $\pm 4$ (c) -4 only (d) 0

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11. The quadratic polynomial, the sum of whose zeroes is -5 and their product is 6, is

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- (a)  $x^2 + 5x + 6$ (b)  $x^2 - 5x + 6$
- (d)  $-x^2 + 5x + 6$ (c)  $x^2 - 5x - 6$

- 12. The number  $\frac{7}{75}$  will have -
  - (a) non-terminating repeating decimal expansion.
  - (b) terminating decimal expansion.
  - (c) non-terminating non repeating decimal expansion.
  - (d) terminating non repeating decimal expansion
- 13. If  $1 + \sin^2 \theta = 3\sin\theta\cos\theta$ , then  $\tan\theta$  will be
  - (a) only 1 (b) only  $\frac{1}{2}$
  - (c) both 1 and  $\frac{1}{2}$  (d) only 2
- 14. If  $\sec \theta \cdot \sin \theta = 0$ , then value of  $\theta$  will be
  - (a) 0 (b)  $90^{\circ}$
  - (c)  $45^{\circ}$  (d)  $\infty$
- 15. The area of the square that can be inscribed in a circle of radius 8 cm is
  - (a)  $256 \,\mathrm{cm}^2$  (b)  $128 \,\mathrm{cm}^2$
  - (c)  $64\sqrt{2} \text{ cm}^2$  (d)  $64 \text{ cm}^2$
- **16.** A man steadily goes 10 m due east and then 24 m due north. What is the distance from the starting point.
  - (a) 25 m (b) 26 m
  - (c) 15 m (d) 18 m

- 17. What is the altitude of an equilateral triangle when each of its side is a ?
  - (a)  $\frac{1}{\sqrt{3}}a$  (b)  $\frac{\sqrt{3}}{3}a$ (c)  $\frac{\sqrt{3}}{4}a$  (d)  $\frac{\sqrt{3}}{2}a$
- 18. The value of  $\sin 30^{\circ} \cos 60^{\circ} + \cos 30^{\circ} \sin 60^{\circ}$  will be
  - (a) 2 (b) 1 (c)  $\frac{1}{\sqrt{3}}$  (d)  $2\sqrt{2}$
- 19. What are the values of x and y for the following pair of linear equations ?

3x + 2y - 7	= 0
4x + y - 6	= 0

- (a) 1 and 2 (b) 2 and 2
- (c) 1 and 1 (d) -1 and -1
- **20.** A card is drawn from a well shuffled deck of playing cards. What is the probability of drawing a red face card?
  - (a)  $\frac{1}{26}$  (b)  $\frac{3}{26}$
  - (c)  $\frac{5}{26}$  (d)  $\frac{7}{26}$

# **SECTION B**

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

21. Mercury, Venus, and Earth revolve around the Sun approximately once every 3 months, 7 months, and 12 months, respectively. If the planets begin lined up, what is the minimum number of months required for them to be aligned again? (Assume that the planets lie roughly in the same plane.)



- (a) 4 years(b) 6 year(c) 7 years(d) 8 year
- 22. What is the ratio in which the point p(m, 6) divides the line segment joining the points A(-4, 3) and

B(2,8).	
(a) 2:3	(b) $3:2$
	( - )

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

**23.**  $(\csc \theta - \sin \theta)(\sec \theta - \cos \theta)(\tan \theta + \cot \theta) = ?$ 

- (a)  $2\sqrt{2}$  (b) 0 (c) 1 (d)  $\sqrt{2}$
- 24. The ratio of incomes of Ram and Shyam is 11:7 and the ratio of their expenditures is 9:5. Each of them manages to save ₹ 400 per month. What is monthly incomes of Ram?
  - (a) ₹ 2200 (b) ₹ 1400
  - (c) ₹ 1100 (d) ₹ 700
- **25.** If one of the zeroes of the quadratic polynomial  $(k-1)x^2 + kx + 1$  is -3, then the value of k is

(-)	4	(1-)	-4
(a)	2	(D)	) <u> </u>
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(c)  $\frac{2}{3}$  (d)  $-\frac{2}{3}$ 

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**26.** Two different dice are thrown together. What is the probability that the number obtained have a product less than 16?

(a)	$\frac{13}{18}$	(b)	$\frac{5}{12}$
(c)	$\frac{2}{3}$	(d)	$\frac{13}{36}$

- **27.** An integer is chosen between 70 and 100. What is the probability that it is a prime number?
  - (a)  $\frac{18}{29}$  (b)  $\frac{23}{29}$
  - (c)  $\frac{11}{29}$  (d)  $\frac{6}{29}$

28.	$\sqrt{\frac{1}{1}}$	$\frac{-\cos\theta}{+\cos\theta}$	for	$\theta = 60^{\circ}$	will	be	
	(a)	$\frac{2}{\sqrt{3}}$				(b)	$\frac{1}{\sqrt{3}}$
	(c)	$\frac{1}{\sqrt{2}}$				(d)	$\frac{3}{\sqrt{2}}$

- **29.** The x-coordinate of a point P is twice its y-coordinate. If P is equidistant from Q(2, -5) and R(-3, 6), the co-ordinates of P will be
  - (a) (4,8) (b) (16,8)
  - (c) (8,16) (d) (8,4)
- **30.** In the given figure, if  $\angle ACB = \angle CDA$ , AC = 6 cm and AD = 3 cm, then the length of AB will be



(a)	6  cm	(b) 4 cm

- (c) 12 cm (d) 8 cm
- **31.** If the co-ordinates of points A and B are (-2, -2) and (2, -4) respectively, what are the co-ordinates of P such that  $AP = \frac{3}{7}AB$ , where P lies on the line segment AB?
  - (a)  $\left(\frac{-2}{7}, \frac{-20}{7}\right)$  (b)  $\left(\frac{2}{7}, \frac{20}{7}\right)$
  - (c)  $\left(\frac{-20}{7}, \frac{-2}{7}\right)$  (d)  $\left(\frac{20}{7}, \frac{2}{7}\right)$
- **32.** In an acute angled triangle *ABC* if  $\sin(A + B C) = \frac{1}{2}$ and  $\cos(B + C - A) = \frac{1}{\sqrt{2}}$ , measure of  $\angle B$  is
  - (a)  $37.5^{\circ}$  (b)  $45^{\circ}$
  - (c)  $75^{\circ}$  (d)  $62.5^{\circ}$
- **33.** What are the HCF and LCM of 510 and 92 ?
  - (a) 4 and 16980 (b) 16980 and 4
  - (c) 23460 and 2 (d) 2 and 23460

- **34.** 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
- **35.** The vertices of quadrilateral *ABCD* are A(5, -1), B(8,3), C(4,0) and D(1, -4). Shape *ABCD* is a\_\_\_\_
  - (a) square (b) rectangle
  - (c) rhombus (d) parallelogram
- **36.** A road which is 7 m wide surrounds a circular park whose circumference is 88 m. What is the area of the road?
  - (a)  $165 \text{ m}^2$  (b)  $330 \text{ m}^2$
  - (c)  $385 \text{ m}^2$  (d)  $770 \text{ m}^2$
- 37. If the circumference of a circle increases from  $4\pi$  to  $8\pi$ , then what about its area ?
  - (a) half (b) 2 times
  - (c) 4 times (d) does not change
- **38.** If  $\alpha$  and  $\beta$  are zeroes of the polynomial  $p(x) = 6x^2 5x + k$  such that  $\alpha \beta = \frac{1}{6}$ . The value of k will be
  - (a) 1 (b) 2 (c) 3 (d) 4
- **39.** What is the area of the shaded region in figure, if PQ = 24 cm, PR = 7 cm and O is the centre of the circle?



- (a)  $210.5 \, \mathrm{cm}^2$
- (b)  $292.8 \, \mathrm{cm}^2$
- (c)  $161.5 \, \mathrm{cm}^2$
- (d)  $192.8 \, \mathrm{cm}^2$
- 40. A fraction become  $\frac{9}{11}$  if 2 is added to both numerator and denominator. If 3 is added to both numerator and denominator it becomes  $\frac{5}{6}$ . The fraction will be
  - (a)  $\frac{5}{11}$
  - (b)  $\frac{5}{9}$
  - (c)  $\frac{7}{9}$
  - (d)  $\frac{6}{11}$

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)

Rani wants to make the curtains for her window as shown in the figure. The window is in the shape of a rectangle, whose width and height are in the ratio 2:3. The area of the window is 9600 square cm.



- 41. What is the shape of the window that is uncovered?
  - (a) Right triangle (b) Equilateral triangle
  - (c) Isosceles triangle (d) Rectangle
- **42.** What will be the ratio of two sides of each curtain (other than hypotenuse) ?
  - (a) 1:3 (b) 2:3
  - (c) 1:1 (d) 3:2
- 43. What are the dimensions of the window ?
  - (a)  $40 \text{ cm} \times 80 \text{ cm}$  (b)  $20 \text{ cm} \times 60 \text{ cm}$ (c)  $80 \text{ cm} \times 120 \text{ cm}$  (d)  $40 \text{ cm} \times 120 \text{ cm}$
- 44. What will be the perimeter of the window ?
  - (a) 200 cm (b) 100 cm
  - (c) 400 cm (d) 450 cm
- 45. How much window area is covered by the curtains?

(a)	50%	(b)	75%
(c)	25%	(d)	80%

#### Case Based Questions: (46-50)

For the box to satisfy certain requirements, its length must be three unit greater than the width, and its height must be two unit less than the width.



- **46.** If width is taken as x, find the polynomial that represent volume of box.
  - (a)  $6x^2 + 4x 12$  (b)  $5x^2 + 3x 12$
  - (c)  $x^3 + x^2 6x$  (d)  $4x^2 + 2x + 4$
- 47. Find the polynomial that represent the area of paper sheet used to make box.
  - (a)  $6x^2 + 4x 12$  (b)  $5x^2 + 3x 12$
  - (c)  $x^3 + x^2 6x$  (d)  $4x^2 + 2x + 4$
- **48.** If it must have a volume of 18 unit, what must be its length and height ?
  - (a) 6 and 1 (b) 5 and 2
  - (c) 6 and 2 (d) 5 and 3
- **49.** If box is made of a paper sheet which cost is ₹ 100 per square unit, what is the cost of paper?
  - (a) ₹ 2100 (b) ₹ 4200
  - (c) ₹ 2800 (d) ₹ 5400
- 50. The graph of y = p(x), where p(x) is a polynomial in variable x, is as follows.



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The number of zeroes of p(x) is ......

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(c) 4 (d) 5

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(b)	Ch-1	1
2	(c)	Ch-3	12
3	(c)	Ch-4	S-145
4	(c)	Ch-4	21
5	(b)	Ch-8	35
6	(c)	Ch-4	39
7	(d)	Ch-6	25
8	(c)	Ch-1	S-12
9	(c)	Ch-3	16
10	(b)	Ch-5	34
11	(a)	Ch-2	5
12	(a)	Ch-1	31
13	(c)	Ch-6	70
14	(a)	Ch-6	36
15	(b)	Ch-7	21
16	(b)	Ch-4	54
17	(d)	Ch-4	42
18	(b)	Ch-6	S-20
19	(a)	Ch-3	38
			1
20	(b)	Ch-8	38
21	(c)	Ch-1	55
22	(b)	Ch-5	70
23	(c)	Ch-6	78
24	(a)	Ch-3	D-74
25	(a)	Ch-2	14

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# SAMPLE PAPER - 19 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
26	(c)	Ch-8	136
27	(d)	Ch-8	79
28	(b)	Ch-6	S-9
29	()	Ch-5	S-15
30	(c)	Ch-4	131
31	(a)	Ch-5	61
32	(a)	Ch-6	105
33	(d)	Ch-1	S-24
34	(d)	Ch-4	46
35	(c)	Ch-5	101
36	(d)	Ch-7	S-9
37	(c)	Ch-7	S-19
38	(a)	Ch-2	S-30
39	(c)	Ch-7	S-29
40	(c)	Ch-3	89
41	(c)	Ch-4	110
42	(a)	Ch-4	111
43	(d)	Ch-4	112
44	(c)	Ch-4	113
45	(a)	Ch-4	114
46	(c)	Ch-2	47
47	(a)	Ch-2	48
48	(a)	Ch-2	49
49	(d)	Ch-2	50
50	(d)	Ch-2	27

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