CARMEL CONVENT SCHOOL, CHANDIGARH

TERM I EXAMINATION (SESSION 2025-2026)

MATHEMATICS

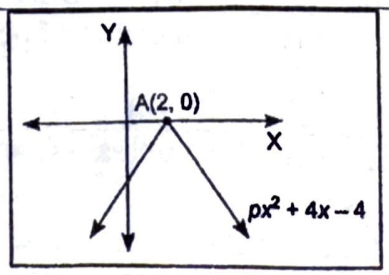
CLASS: X **TOTAL MARKS: 80**

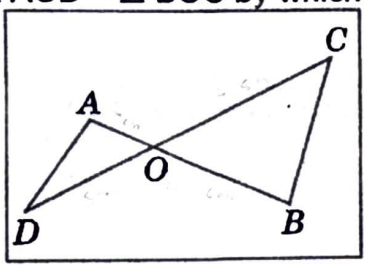
DATE: 09.09.2025 **TIME: 3 HOURS**

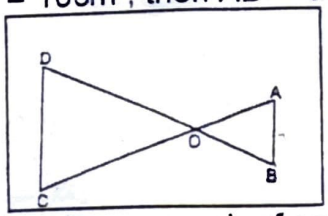
General Instructions:

(i) All questions are compulsory.
(ii) There are 38 questions in the paper.
(iii) The question paper has five sections: A, B, C, D and E.
Section–A has 20 questions (Q1 to 20) of 1 mark each.
Section–B has 5 questions (Q21 to 25) of 2 marks each.
Section–C has 6 questions (Q26 to 31) of 3 marks each.
Section D has 4 questions (Q32 and 35) of 5 marks each.
Section–E has 3 Case Study questions (Q36 to 38) of 4 marks each.
(iv) All questions are compulsory . Draw neat figures wherever required.

SECTION A

Q. No.	Question	Marks
1	The Fundamental Theorem of Arithmetic states that: a) Every integer > 1 is even b) Every composite number has a unique prime factorization c) HCF × LCM = product of two numbers d) $\sqrt{2}$ is irrational	1
2	The decimal expansion of rational number 7/ 80 terminates after how many decimal places a) 1 b) 2 c) 3 d) 4	1
3	The number of quadratic polynomials having zeros -1 and 3 is a) 1 b) 2 c) 3 d) more than 3	1
4		1

	The graph of the polynomial $P(x) = px^2 + 4x - 4$ is given as above. The value of p is. a) 0 b) 2 c) -1 d) 1	
5	The value of 'k' for which the system of linear equations $x + 2y = 3$; $5x + ky + 7 = 0$ is inconsistent is a) -14/3 b) 2/5 c) 5 d) 10	1
6	Match the following 1 — $2x + 5y = 10$, $3x + 4y = 7$ — A — Unique solution 2 — $2x + 5y = 10$, $6x + 15y = 20$ — B — Infinitely many solutions 3 — $5x + 2y = 10$, $10x + 4y = 20$ — C — No common solution a) 1 - A, 2 - B, 3 - C b) 1 - B, 2 - C, 3 - A c) 1 - C, 2 - B, 3 - A d) 1 - A, 2 - C, 3 - B	1
7	The pair of equations $x = 4$ and $y = 3$ graphically represents the lines which are a) parallel b) intersecting at (3 , 4) c) coincident d) intersecting at (4 , 3)	1
8	The midpoint of the line segment joining the points P(-4 , 5) and Q(4 , 6) a) x - axis b) y - axis c) origin d) neither x - axis nor y - axis	1
9	In the given figure OA = 4 cm; OB = 6 cm OD = 5 cm and OC = 7.5 cm. Then $\triangle AOD \sim \triangle BOC$ by which criteria of similarity.  a) SAS b) SSS c) AAA d) SSA	1
10	The coordinates of the point, which is reflection of point (-3, 5) in X axis are (a) (3,5) (b) (3, -5) (c) (-3, -5) (d) (-3, 5)	1
11	In $\triangle ABC$, right angled at B , AB = 5cm and sin C = ½. The length of side AC is a) 12 b) 2 c) 6 d) 10	1
12	In the formula $\bar{X} = a + h\frac{f_i u}{f_i}$, for finding mean of grouped frequency distribution , u_i =	1

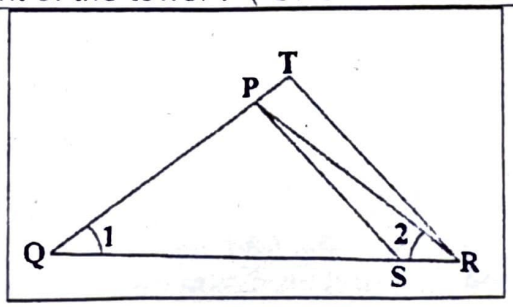
	a) $\frac{x_i + a}{h}$ b) $h(x_i - a)$ c) $\frac{x_i - a}{h}$ d) $\frac{a - x_i}{h}$	
13	If sec A = 2 cos A, find the value of A a) 45° b) 60° c) 30° d) 0°	1
14	If the length of the shadow on the ground of the pole is $\sqrt{3}$ times the height of the pole, then the angle of elevation of the Sun is a) 30° b) 45° c) 60° d) 90°	1
15	The angle of depression of a car, standing on the ground, from the top of a 75 m high tower is 30°. The distance of car from the base of the tower in metres is a) $25\sqrt{3}$ m b) $50\sqrt{3}$ m c) $75\sqrt{3}$ m d) 150 m	1
16	The empirical relation between the Mode, Median, and Mean of a distribution is a) Mode = 3 Median - 2 Mean b) Mode = 3 Mean - 2 Median c) Mode = 2 Median - 3 Mean d) Mode = 2 Mean - 3 Median	1
17	Two dice are thrown at the same time and the product of numbers appearing on them is noted. The probability that the product of numbers lie between 8 and 13 is a) 7/36 b) 5/36 c) 2/9 d) 1/4	1
18	All queens , jacks, and aces are removed from a pack of 52 playing cards. The remaining cards are shuffled and one card is picked up at random from it. The probability of that card to be a king is a) 1/10 b) 1/13 c) 3/10 d) 3/13	1
19	Q19 and Q20 are Assertion and reasoning questions In these questions, a statement of assertion(A) is followed by a statement of reason(R) . Choose the correct option : a) Both assertion(A) and reason (R) are true and reason(R) is the correct explanation of assertion (A) b) Both assertion(A) and reason (R) are true and reason(R) is not the correct explanation of assertion(A) c) Assertion(A) is true but reason (R) is false d) Assertion(A) is false but reason (R) is true **Assertion** (A) : In the given figure, if AO/CO = BO/DO = ½ CD = 10cm , then AB = 4 cm  **Reason**(R) : If in two triangles, one pair of corresponding sides of proportional and the included angles are equal. Then the two triangles are similar.	1

20	**Assertion** (A) : The point (-2 , 0) lies on the x - axis. **Reason** (R) : The y - coordinate of any point on x- axis is zero	1

SECTION – B

Q. No.	Question	Marks
21	Prove that $\sqrt{5}$ is an irrational number	2
22	Find a quadratic polynomial whose zeros are -9 and -1/9	2
23	If Q(0 , 1) is equidistant from P (5, 3) and R(x, 6), find the value of x.	2
24	Prove that $1 + \frac{cot^2\theta}{1+cosec\theta} = cosec\theta$	2
25	A box contains cards numbered from 1 to 20. A card is drawn at random from the box. Find the probability that the number of the drawn card is a) a prime number, b) a composite number	2

SECTION – C

Q. No.	Question	Marks
26	Vijay invested a certain amount of money in two schemes, A and B which offer interest at the rate of 8% per annum and 9% per annum respectively. He received ₹1860 as the total annual interest. However, had he interchanged the amount of investments in the two schemes, he would have received ₹20 more as annual interest. How much money did he invest in each scheme?	3
27	State and prove Thale's Theorem.	3
28	Verify: $\frac{cos\theta - sin\theta + 1}{cos\theta + sin\theta - 1} = cosec\theta + \cot\theta$	3
29	The shadow of a vertical tower on level ground increases by 10m when the altitude of the sun changes from angle of elevation 45° to 30°. Find the height of the tower . (Given $\sqrt{3} = 1.732$)	3
30	 In the given figure $\frac{QR}{QS} = \frac{QT}{PR}$, $\angle 1 = \angle 2$,	3

	Show that $\triangle PQS \sim \triangle TQR$	
31	The distribution below gives the weight of 30 students of a class. Find the median weight of the students.	3

Weight(in kg)	40-45	45-50	50-55	55-60	60-65	65-70	70-75
No. of students	2	3	8	6	6	3	2

SECTION – D

Q. No.	Question	Marks
32	Solve the pair of linear equations graphically. $x - y = 1$ $\quad\quad$ $2x + y = 8$ Determine the vertices of the triangle formed by the lines representing the above equations and the y- axis. Also, find the area of the triangle so obtained.	5
33	CD and GH are, respectively, the bisectors of $\angle ACB$ and $\angle EGF$ such that D and H lie on sides AB and FE of $\triangle ABC$ and $\triangle EFG$ respectively. If, $\triangle ABC \sim \triangle FEG$ show that a) $\frac{CD}{GH} = \frac{AC}{FG}$ b) $\triangle DCB \sim \triangle HGE$ c) $\triangle DCA \sim \triangle HGF$	5
34	An aeroplane is flying at a height of 300 m above the ground. Flying at this height, the angles of depression from the aeroplane, of two points on both the banks of river in opposite directions are 45° and 60° respectively. Find the width of the river. (Given $\sqrt{3} = 1.732$)	5
35	Find the missing frequency 'f' in the following table, if the mean of the given data is 18. Hence, find the mode.	5

Marks Obtained	Number of students
11 - 13	7
13 - 15	6
15 - 17	9
17 - 19	13
19 - 21	f
21 - 23	5
23 - 25	4

Section E

Question number 36 to 38 are case based questions. Each question has three sub parts

Q. No.	Question	Marks
36	A school is distributing ribbons to participants in two competitions for the Annual Science Fair. There are 96 Blue ribbons for science project winners and 120 Green ribbons for quiz winners. The teachers want to make sets so that, *Each set has the same number of blue ribbons. *Each set has the same number of green ribbons. *All ribbons are distributed with none left over.  (a) What is the highest number of sets that can be made so that each set has an equal number of both types of ribbons? (b) How many blue and green ribbons will be in each set? (c) If each blue ribbon cost ₹12 and each green ribbon cost ₹15, what is the total cost of all the ribbons in one set?	4 (1,1,2)
37	A family from Lucknow(L) decides to visit Bhuj(B), Nashik(N), and Puri(P) in that order. Their respective coordinates on the map are : L(2,3) , B(5,7) , N(8,3) , P(5,0)  a) Find the distance between Lucknow and Bhuj b) There is a town right at the midway of Nashik and Puri. What are the coordinates of that town? c) If Kota (K) divides the segment LB in the ratio of 3:2. Find the coordinates of K.	4 (1,1,2)
38	Three persons toss 3 coins simultaneously and note the outcomes. Then they ask a few questions to one another. Help them in finding the answers of the following questions.	4 (1,1,2)

a) What will be the probability of getting at most one tail?
b) What is the probability of getting exactly one head?
c) What is the product of probability of getting at most 3 heads and exactly 3 tails?

'The End'