

CARMEL CONVENT SCHOOL, CHANDIGARH
TERM I EXAMINATION (2024-25)
MATHEMATICS

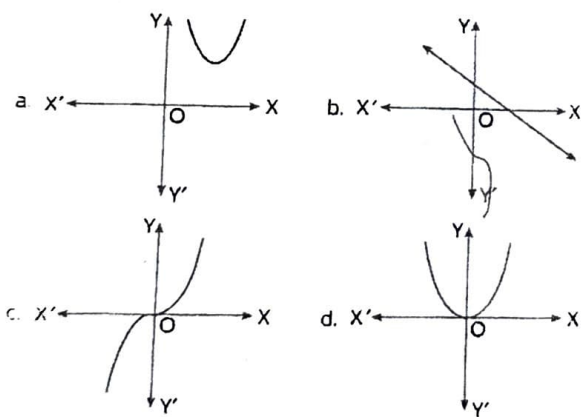
CLASS: 10
DATE: 12.09.24

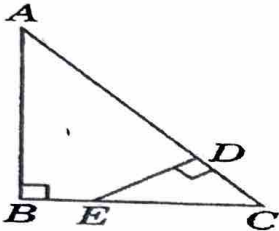
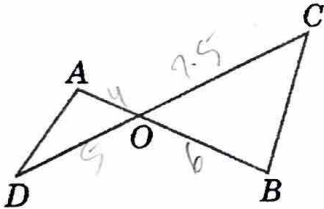
TOTAL MARKS: 80
TIME: 3 HOURS

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	If the product of two co-prime numbers is 553, then their HCF is a) 1 b) 553 c) 7 d) 79	1
2	The HCF x LCM for the numbers 50 and 20 is a) 10 b) 100 c) 1000 d) 50	1
3	Which of the following figures represent the graph of a linear equation? 	1
4	A quadratic polynomial whose zeros are -3 and 4 is a) $x^2 - x + 12$ b) $x^2 + x + 12$ c) $x^2 - x - 12$ d) $2x^2 + 2x - 24$	1
5	If zeros of the quadratic polynomial $ax^2 + x + a$ are equal, then the value of a is a) $1/2$ b) $-1/2$ c) $\pm 1/2$ d) ± 1	1

6	One equation of a pair of dependent linear equations in two variables having infinitely many solutions is $-5x + 7y = 2$. The second equation can be a) $10x + 14y + 4 = 0$ b) $-10x - 14y + 4 = 0$ c) $-10x + 14y + 4 = 0$ d) $10x - 14y = -4$	1
7	The lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel, the value of k is a) $-5/4$ b) $2/5$ c) $15/4$ d) $3/2$	1
8	In the given figure, $\angle ABC = 90^\circ$ and $ED \perp AC$, then $\triangle ABC$ similar to  a) $\triangle CDE$ b) $\triangle EDC$ c) $\triangle CED$ d) $\triangle ECD$	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) None of these	1
10	If ABC and DEF are two triangles and $AB/DE = BC/FD$, then the two triangles are similar if (a) $\angle A = \angle F$ (b) $\angle B = \angle D$ (c) $\angle A = \angle D$ (d) $\angle B = \angle E$	1
11	Given that $\sin \theta = a/b$, find $\cos \theta$ a) $\frac{b}{\sqrt{b^2 - a^2}}$ b) $\frac{b}{a}$ c) $\frac{\sqrt{b^2 - a^2}}{b}$ d) $\frac{a}{\sqrt{b^2 - a^2}}$	1
12	If $\sin^2 \theta + \sin \theta = 1$, then the value of $\cos^2 \theta + \cos^4 \theta$ is a) -1 b) 1 c) 0 d) 2	1
13	If $\tan \theta = \sin 45^\circ + \sin 30^\circ$, then θ equals a) 45° b) 90° c) 30° d) $1/2$	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	From a point on the ground 30 m away from the foot of the tower, the angle of elevation of top of the tower is 30° . The height of the tower is. a) 30 m b) $10\sqrt{3}$ m c) 10 m d) $30\sqrt{3}$ m	1
16	The mode of the distribution: 7,4,3,5,6,3,3,2,4,3,4,3,3,4,4,2,3 a) 2 b) 3 c) 4 d) 5	1
17	The mean, and the median of a data are 12 and 15 respectively, then the mode is a) 13.5 b) 21 c) 6 d) 14	1
18	If a die is thrown, what is the probability of getting a number less than 4 and greater than 3? a) 0 b) 1 c) $1/3$ d) $2/3$	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) : $1242 / 49$ is it non-terminating repeating decimal. Reason(R) : The rational number p by q is a terminating decimal if $q = (2^m \times 5^n)$ for some whole numbers, m and n.	1
20	Assertion (A) : Cards numbered 5 to 102 are placed in a box. If a card is selected at random from the box, then the probability that the card selected has a number, which is a perfect square, is $4 / 49$. Reason(R) : Probability of an event E is a number $P(E)$ such that $0 \leq P(E) \leq 1$	1

SECTION – B

Q. No.	Question	Marks
21	Explain why $(17 \times 5 \times 11 \times 3 \times 2 + 2 \times 11)$ is a composite number?	2
22	If the sum of zeros of the quadratic polynomial $x^2 + 4kx - 3$ is 4, then find the value of k.	2

23	The angles of a triangle are x , y and 40° . The difference between two angles x and y is 30° . Find x and y .	2
24	Simplify: $(1 + \tan^2 \theta) (1 - \sin \theta) (1 + \sin \theta)$	2
25	One card is drawn from a well shuffled deck of 52 cards. Find the probability that the card drawn is is a) A red king b) Not a black card	2

SECTION – C

Q. No.	Question	Marks																		
26	Prove that $\sqrt{5}$ is an irrational number. Hence prove that $2 + 3\sqrt{5}$ is an irrational number.	3																		
27	The sum of digits of a two digit number is 12. Seven times the number is equal to 4 times the number obtained by reversing the order of the digits. Find the number.	3																		
28	Sides AB and BC and median AD of $\triangle ABC$ are respectively proportional to side PQ and QR and median PM of $\triangle PQR$. Show that $\triangle ABC \sim \triangle PQR$.	3																		
29	A boy 1.7m tall is standing on horizontal ground, 50 m away from the building. The angle of elevation of the top of the building from his eye is 60° . Calculate the height of the building. (Given $\sqrt{3} = 1.732$)	3																		
30	The following cumulative frequency distribution is given <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Less than 20</td> <td>Less than 30</td> <td>Less than 40</td> <td>Less than 50</td> <td>Less than 60</td> <td>Less than 70</td> <td>Less than 80</td> <td>Less than 90</td> <td>Less than 100</td> </tr> <tr> <td>0</td> <td>4</td> <td>16</td> <td>30</td> <td>46</td> <td>66</td> <td>82</td> <td>92</td> <td>100</td> </tr> </table> <p>Write the ordinary frequency distribution.</p>	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80	Less than 90	Less than 100	0	4	16	30	46	66	82	92	100	3
Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80	Less than 90	Less than 100												
0	4	16	30	46	66	82	92	100												
31	Find the mean of the following data by assumed mean method. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Class</td> <td>10-20</td> <td>20-30</td> <td>30-40</td> <td>40-50</td> <td>50-60</td> <td>60-70</td> <td>70-80</td> </tr> <tr> <td>Frequency</td> <td>4</td> <td>8</td> <td>10</td> <td>12</td> <td>10</td> <td>4</td> <td>2</td> </tr> </table>	Class	10-20	20-30	30-40	40-50	50-60	60-70	70-80	Frequency	4	8	10	12	10	4	2	3		
Class	10-20	20-30	30-40	40-50	50-60	60-70	70-80													
Frequency	4	8	10	12	10	4	2													

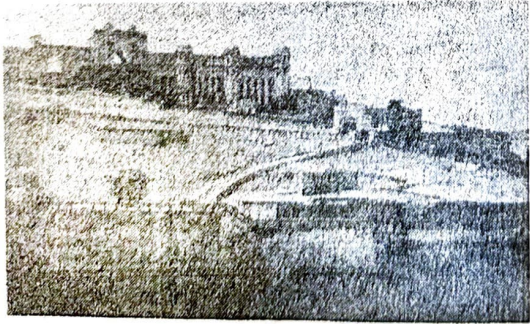
SECTION – D

Q. No.	Question	Marks
32	Solve the pair of linear equations graphically. $4x - 5y - 20 = 0$ $3x + 5y - 15 = 0$ 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 obtained.	5

33	<p>State and prove Basic Proportionality theorem. Hence prove the following: ABCD is a trapezium in which AB parallel to DC and its diagonals intersect each other at point O show that:</p> $\frac{AO}{BO} = \frac{CO}{DO}$	5																
34	$\frac{\sin\theta - \cos\theta + 1}{\sin\theta + \cos\theta - 1} = \frac{1}{\sec\theta - \tan\theta}$	5																
35	<p>The median of the following data is 50. Find the values of p and q, if the sum of all frequencies is 90.</p> <table border="1" data-bbox="194 549 845 946"> <thead> <tr> <th>Marks Obtained</th> <th>Number of students</th> </tr> </thead> <tbody> <tr> <td>20 - 30</td> <td>p</td> </tr> <tr> <td>30 - 40</td> <td>15</td> </tr> <tr> <td>40 - 50</td> <td>25</td> </tr> <tr> <td>50 - 60</td> <td>20</td> </tr> <tr> <td>60 - 70</td> <td>q</td> </tr> <tr> <td>70 - 80</td> <td>8</td> </tr> <tr> <td>80 - 90</td> <td>10</td> </tr> </tbody> </table>	Marks Obtained	Number of students	20 - 30	p	30 - 40	15	40 - 50	25	50 - 60	20	60 - 70	q	70 - 80	8	80 - 90	10	5
Marks Obtained	Number of students																	
20 - 30	p																	
30 - 40	15																	
40 - 50	25																	
50 - 60	20																	
60 - 70	q																	
70 - 80	8																	
80 - 90	10																	

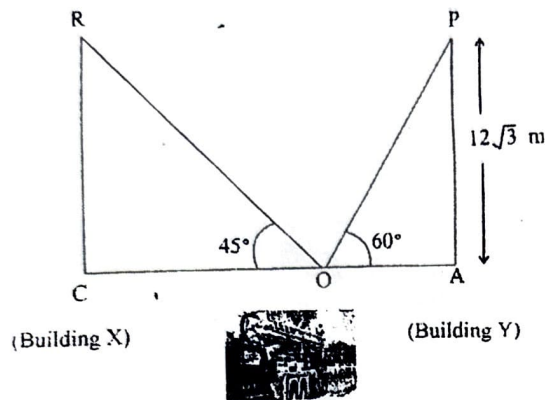
SECTION E

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

Q. No.	Question	Marks
36	<p>Amber Fort situated in Amer, Rajasthan is one of the famous tourist destinations. The fort was built by Mughals and is famous for its artistic style and designs. The entry ticket for the fort is ₹150 for Indians and ₹400 for foreigners. One day the cashier found that 480 tickets were sold and ₹134500 was collected.</p>  <p>Based on the above information, answer the following questions:</p> <ol style="list-style-type: none"> If x and y are the number of Indians and foreigners, respectively, then write the equations that models the problem? How many Indians visited the fort on that day? How much would be collected if 300 Indians and 350 foreigners visit the fort? 	4 (1,2,1)

37

Due to a short circuit, a fire broke out in the New home complex. Two buildings, namely X and Y have mainly been affected. The fire engine has arrived and it has been stationed at a point which is in between the two buildings. A ladder at point O is fixed in front of the fire engine. The ladder inclined at an angle of 60° to the horizontal is leaning against the wall of the terrace of the building Y. The foot of the ladder is kept fixed, and after some time, it is made to lean against the terrace of the opposite building X at an angle of 45° with the ground. Both the buildings along with the foot of the ladder fixed at O are in a straight line.

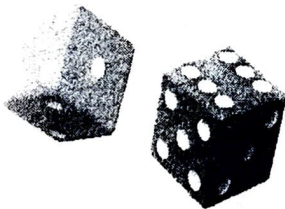


Based on the above, given information, answer the following questions

- Find the length of the ladder
- Find the distance of building Y from point O i.e. OA
- Find the horizontal distance between the two buildings.

38

The Modern day cubicle dice originated in China and have been dated back as early as 600 BC. Dice were handcrafted and produced on a small scale up until the 20th century. A pair of dice is rolled.



Based on the above information, answer the following questions

- What will be the probability of getting a doublet of prime numbers?
- What is the probability of not getting 4 in either of two dice?
- What is the probability that the product of numbers is a perfect square?

4
(1,1,2)4
(1,1,2)

'The End''