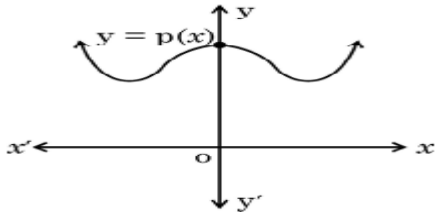
KENDRIYA VIDYALAYA

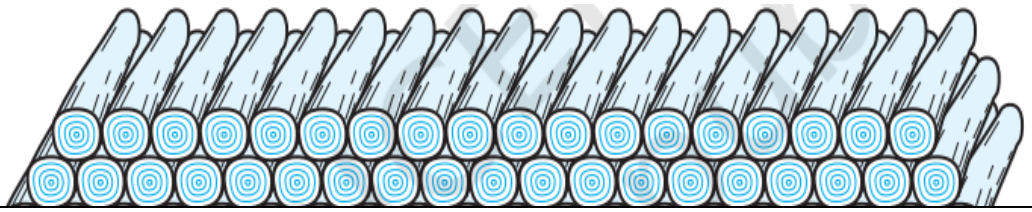
PT -2 EXAM

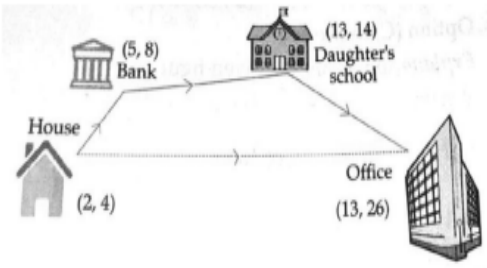
CLASS- X	**SUBJECT: MATHS**
MM: 80	**TIME: 3 HRS**

General Instructions:

1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

Q	**SECTION A**	M
1	If two positive integers a and b are written as a = $x^3 y^2$ and b = $x y^3$, where x, y are prime numbers, then the result obtained by dividing the product of the positive integers by the LCM (a, b) is (a) xy (b) $x y^2$ (c) $x^3 y^3$ (d) $x^2 y^2$	1
2	If HCF (x,8) = 4 LCM (x,8) = 24 then x is (a) 8 (b) 10 (c) 12 (d) 14	1
3	If a pair of equations is consistent, then the lines representing them are (a)Parallel (b) always coincident (c) intersecting or coincident (d) always intersecting	1
4	The system of equation x = 0, y= 3 has (a) A unique solution (b) no solutions (c) two solutions (d) infinitely many solutions	1
5	The nature of roots of the quadratic equation $9x^2 - 6x - 2 = 0$ is: (a) No real roots (b) 2 equal real roots (c) 2 distinct real roots (d) More than 2 real roots	1
6	The number of real roots of equation $x^2 + 3x + 2 = 0$ is (a) 2 (b) 3 (c) 0 (d) 4	1
7	Assertion (A): The point (0, 4) lies on y-axis. Reason(R): The x-coordinate of a point on y-axis is zero (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.	1
8	Two APs have the same common difference. The first term of one of these is –1 and that of the other is – 8. The difference between their 4th terms is (a) 1 (b) -7 (c) 7 (d) 9	1
9	Distance of a point P(x,y) from the origin O(0,0) is given by OP = .	1
10	Distance between the following pairs of points :(2, 3), (4, 1)	1
11	The graph of polynomial f(x) is shown in fig The number of zeroes of f(x) is-  (a) 3 (b) 2 (c) 1 (d) 4	1
12	In Δ ABC, DE ∥ AB. If AB = a, DE = x, BE = b and EC = c. Then x expressed in terms of a, b and c is: a) ac/b (b) ac/(b+c) (c) ab / c (d) ab /(b+c)	1
13	The value of cosec60° is	1

14	The coordinates of any point on abscissa are of the form (x,0) TRUE/FALSE	1
15	The coordinates of any point on ordinate are of the form (y ,0) TRUE/FALSE	1
16	A point (x,y) is at a distance of 5 units from the origin. How many such points lie in the third quadrant? (a) 0 (b) 1 (c) 2 (d) infinitely many	1
17	All the congruent figures are similar but the converse is not true. TRUE/FALSE	1
18	2 cos A=1 then value of A is equal to .	1
19	**Assertion**: for some integer n the odd integer is represented in the form of 2n+1 **Reason**: 2n represent the even number and 2n+1 will represent odd a) both Assertion and reason are correct and reason is correct explanation for assertion b) both Assertion and reason are correct but reason is not correct explanation for Assertion c) Assertion is correct but reason is false d) both Assertion and reason are false.	1
20	**Assertion:** Sum of natural number from 1 to 100 is 5050. **Reason:** Sum of n natural number is n(n+1)/2. a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion. c.) assertion is true but the reason is false. d.) both assertion and reason are false.	1
	SECTION: B	
21	Find the sum of the first 15 multiples of 8.	2
22	If α, β are zeroes of quadratic polynomial $\mathbf{5x^2 + 5x + 1}$, find the value of $\boldsymbol{\alpha^{-1} + \beta^{-1}}$	2
23	Find the values of k for quadratic equations, so that they have two equal roots. $2x^2 + kx + 3 = 0$	2
24	Which term of the AP: 3, 8, 13, 18. .... . is 78?	2
25	Find the coordinates of the point which divides the join of (–1, 7) and (4, –3) in the ratio 2 : 3.	2
	SECTION: C	
26	ABCD is a trapezium in which AB || DC and its diagonals intersect each other at the point O. Show that $\frac{AO}{BO} = \frac{CO}{DO}$	3
27	Find two numbers whose sum is 27 and product is 182. Or Find the zeroes of the quadratic polynomial $4s^2 - 4s + 1$ and verify the relationship between the zeroes and the coefficients	3
28	Solve 2x + 3y = 11 and 2x – 4y = – 24 and hence find the value of 'm' for which y = mx + 3.	3
29	Prove that $\sqrt{3}$ is irrational.	3
30	Find the ratio in which the line segment joining A(1, – 5) and B(– 4, 5) is divided by the x-axis. Also find the coordinates of the point of division.	3
31	If tan (A + B) = $\sqrt{3}$ and tan (A – B) = $1/\sqrt{3}$; $0° < A + B < 90°$; A > B, find A and B. OR Find the value of x if $2\,\text{cosec}^2 30 + x \sin^2 60 - 3/4 \tan^2 30 = 10$	3
	SECTION: D	
32	Solve the following system of linear equations graphically: $3x + y - 12 = 0$; $x - 3y + 6 = 0$ Shadow the region bounded by these lines and the x-axis. Also find the ratio of areas of triangles formed by given lines with x-axis and the y-axis.	5
33	State & prove Basic proportionality theorem.	5
34	$\frac{\sin\theta - \cos\theta + 1}{\sin\theta + \cos\theta - 1} = \frac{1}{\sec\theta - \tan\theta}$ using the identity $\sec^2\theta = 1 + \tan^2\theta$. **Or** a. $(\sin A + \text{cosec } A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$ b. Find the value of: $9 \sec^2 A - 9 \tan^2 A$.	5
35	200 logs are stacked in the following manner: 20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on (see Fig.). In how many rows are the 200 logs placed and how many logs are in the top row? 	5

	SECTION: E	
36	Three friends Virat, Rohit, and Sachin used to ride their bicycles around their Society's park every day in the evening. The shape of the society's park is a Rectangle  One day, they decide to play a game. All three have a ringing bell on their bicycle. They ring the bell at an interval of 9, 12, 15 minutes respectively means after every 9 mins Virat rings the bell, after every 12 mins Rohit rings the bell and after every 15 mins, Sachin rings the bell. (a) If they start ringing together a time, after what time will they next ring together? (b) If only Sachin and Virat play this game, then after what time will they next ring together? (c)Find LCM of numbers whose prime factorisation are expressible as 3×5^2 and $3^2 \times 7^2$.	4
37	Your elder brother wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of Rs 1,18,000 by paying every month starting with the first instalment of Rs 1000. If he increases the instalment by Rs 100 every month , answer the following:  (a) The amount paid by him in 30th instalment is (b) The amount paid by him in the 30 instalments is (c) The ratio of the 1st instalment to the last instalment is	4
38	Sanjay starts walking from his house to office. Instead of going to the office directly, he goes to a bank first, from there to his daughter ‘s school and then reaches the office. Assume that all the distances are covered in a straight line. If the house is situated at (2 , 4), bank at (5 , 8), school at (13 , 14) snd office at (13 , 26) and coordinates are in Km. Based on the above information answer the following questions.  (i) Find the distance between house and bank. (ii) Find the distance between bank and Daughter’s school. (iii) What is the total distance travelled by Sanjay between house and office?	4