STD:X 7/12/2020	**KAPOL VIDYANIDHI INTERNATIONAL SCHOOL(ICSE)** **TEMPLE OF KNOWLEDGE** **FIRST PRELIMINARY EXAMINATION** **MATHEMATICS**	**DUR: $2\frac{1}{2}$ hrs.** **Marks: 80**

Answer to this paper must be written on the paper provided separately.
*You will not be allowed to write during first **15 minutes**. This time is to be spent in reading the question paper. The time given at the head of this paper is the time allowed for writing the answers. **Attempt all questions from section A** and*
***any four questions from section B**.*
All working, including rough work, must be clearly shown and must be done on the same sheet as the rest of the answer. Omission of essential working will result in the loss of marks The intended marks of questions or parts of questions are given in brackets [ ].Mathematical tables are provided.

SECTION-A [40 Marks]

Answer <u>all</u> questions from this section.

Question 1:

a) Find the number of terms in the AP. [3]

$18, 15\frac{1}{2}, 13, \ldots\ldots -47$

b) Find the values of x ,which satisfy the inequation : [3]

$$-1\frac{1}{6} \leq \frac{x}{2} + \frac{5}{6} < 2,\ x \in \mathrm{R}$$

Graph the solution set on the number line.

c) There are 12 cards numbered 1 to 12 .Whats is the probability that the card picked up randomly has : [4]

i) A prime number
ii) Number between 3 and 11
iii) A perfect square number
iv) A perfect cube number

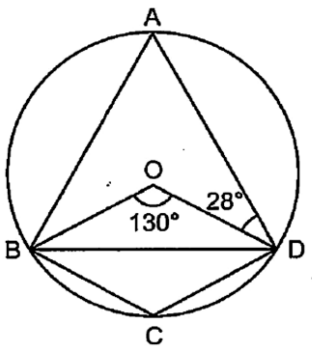
Question 2:

a) Find the value of x *and* y *if* [3]

$$\begin{bmatrix} -4 & 1 \\ 2 & 5 \end{bmatrix} \begin{bmatrix} -2 \\ 3x \end{bmatrix} + 2 \begin{bmatrix} -3 \\ 2 \end{bmatrix} = 5 \begin{bmatrix} 1 \\ y \end{bmatrix}$$

b) Radha opened a Recurring Deposit Account in a bank and deposited ₹2000 per month .If the bank paid interest at the rate of 11% p.a ,what is the amount received by Radha, after 2 years ? [3]

c) A,B,C and D are the points on the circumference of the circle with center O . [4]
$\angle BOD = 130°$, $\angle ADO = 28°$.



Find $\angle BAD$, $\angle BCD$, $\angle OBD, \angle ABO$

Question 3:

a) Prove $(x - 3)$ is the factor of $6x^3 - 23x^2 + 9x + 18$. [3]
Hence factorise the given expression completely .

b) A is on $x - axis$ and B is on $y - axis$ .If mid-point of AB is $P(-3,4)$,find: [3]
i) The coordinates of A and B.
ii) Slope AB

c) Arjun ,firing at a target ,can score from 0 to 6 points for each score of his shots.After firing 25 shots his scores were distributed as follows : [4]

Scores	0	1	2	3	4	5	6
No. of shots	2	8	4	5	3	2	1

Find mean,median and mode of the given distribution .

Question 4:

a) Solve for x using the quadratic formula. Write your answer correct to two significant figures :$(x - 1)^2 - 3x + 4 = 0$ [3]

b) Calculate the ratio in which $P(7, b)$ divides the line joining $A(2,6)\ and\ B(10, -2)$ [3]
Also find the value of b

c) $Prove: (sinA + cosecA)^2 + (cosA + secA)^2 = 7 + tan^2A + cot^2A$ [4]

SECTION-B [40 Marks]
Attempt any Four questions from this section .

Question 5:

a) A statue 1.8 m tall stands on the top of a pedestal.From a point on the ground ,the angle of elevation of the top and the bottom of the statue are $60° \; and \; 45°$. Find the height of the pedestel. [4]

b) The following table shows the marks scored by 80 students in an examination of $Sandipani\ New\ Generation\ School$. [6]

Marks	0–10	10–20	20–30	30–40	40–50	50–60	60–70	70–80
No. of students	3	7	15	24	16	8	5	2

Draw an ogive for the given distribution in a graph sheet using scale $2cm = 10units$ On both the axes .

Use the Ogive to estimate the :

i) Median
ii) Lower quartile.
iii) Number of students who scored more than 65 marks .
iv) The number of students who did not pass in the examination if the pass mark is 35

Question 6:

a) Using properties of proportion ,solve for a ,if [3]

$$\frac{\sqrt{7a^2+1}+2a}{\sqrt{7a^2+1}-2a}=7$$

b) A natural number when ,increased by 12 ,equals 160 times its reciprocal .Find the number. [3]

c) [4]

i) Plot the points $A(4,6) \; and \; B(1,2)$ on graph paper.
ii) A' is the image of A when reflected in $x - axis$.
iii) B' is the image of B when reflected in the line AA'
iv) Give a geometrical name for the figure $ABA'B'$
v) Write the equation for AA'

Question 7:

a) Nitya Kishori deposits ₹ 500 every month in a recurring deposit scheme and receives ₹16,550 at the end of $2\frac{1}{2}$ years .Calculate the rate of interest given by the Bank. [3]

b) Find the values of x ,which satisfy the inequation : [3]

$$\frac{3x}{4} - 1 < \frac{x}{4} + 5 \leq x - \frac{1}{4}, \; x \in W$$

Graph the solution set on the number line.

c) Calculate the ***mean*** of the following frequency distribution using suitable method . [4]

Class -interval	84-90	90-96	96-102	102-108	108-114
Frequency	8	12	15	10	5

Question 8:

a) Polynomial $x^3 - ax^2 + bx - 6$ leaves remainder -8 when divided by $x - 1$ and $x - 2$ is a factor of it .Find the value of $\boldsymbol{a}$ *and* $\boldsymbol{b}$ **.** [3]

b) From a solid cylinder of height $7cm$ and base diameter $12cm$,a conical cavity of same height and same base radius is hollowed out .Find the total surface area of the remaining solid. [3]

c) If the mean of the following distribution is 30 ,find the value of a [4]

Marks	0–10	10–20	20–30	30–40	40–50	50–60
No. of students	4	a	12	15	7	4

Question 9:

a) If the point $P(-1, 2)$ divides the line joining $A(2,5)$ *and* $B(a, b)$ in the ratio 3: 4,find the value of $a \times b - a$ [3]

b) Prove :$\frac{cosA}{1+sinA} + tanA = secA$ [3]

c) The following table shows the expenditure of 60 boys on books from $Onlinekitaab.com$ Find the mode of their expenditure using graph. [4]

Expenditure ₹	20-25	25-30	30-35	35-40	40-45	45-50
No. of students	4	7	23	18	6	2

Question 10:

a) If $A = \begin{bmatrix} 2 & -3 \\ p & q \end{bmatrix}$ find $p\ and\ q$ so that $A^2 = I$ where I is unit matrix [3]

b) If the sum of the first 14 term of an A.P is 1050 and its first term is 10, find the $20th$ term. [3]

c) Solve the following equation for x and give your answer correct to 2 decimal places [4]
$3x^2 + 5x - 9 = 0$

Question 11:

a) If two digit numbers are made with $3,5,7\ and\ 9$,what is the probability that the number is : [3]

i) $Greater\ than\ 55$

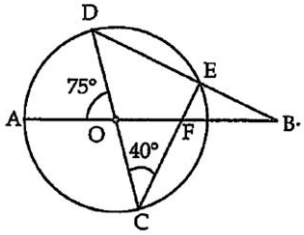
ii) $A\ prime\ number$

iii) $A\ perfect\ square$

b) Find the equation of a line whose slope and $y - intercept$ have same numerical value and pass through the point $A(3, -4)$ [3]

c) In the given figure ,straight line AB and CD pass through the centre O of the circle . [4]

If $\angle OCE = 40°\ and\ \angle AOD = 75°\ Find\ \angle CDE\ and \angle OBE$



All The Best

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Q 1		[3]
		[3]
		[4]
Q2		[3]
		[3]
		[4]