



B.K. KUMAR'S ACADEMY

Sub. : Math-I
Std. X (State Board)

Pre. Question Paper - 01

Total Marks : 40
Time : 2 hours

General Instructions :

Read the following instructions carefully and follow them:

1. All questions are compulsory. 2. Use of a calculator is not allowed. 3. The numbers to the right of the questions indicate full marks. 4. In case of MCQs [Q. No. 1 (A)] only the first attempt will be evaluated and will be given credit. 5. For every MCQ, four alternatives (A), (B), (C), (D) of answers are given. Alternative of correct answer is to be written in front of the subquestion number.

Q.1 : A) Solve multiple choice questions. (4)

- 1) If $x = a$, $y = b$ is the solution of the equation $x - y = 2$ and $x + y = 4$, then the value of a and b are, respectively
 - a. 3 and 5
 - b. 5 and 3
 - c. 3 and 1
 - d. -1 and -3
- 2) The expenditure Rs. 45,000 on cement was shown by a sector of central angle of 75° . What was the total expenditure of the construction?
 - a) 2,16,000
 - b) 3,60,000
 - c) 4,50,000
 - d) 7,50,000
- 3) To draw graph of $4x + 5y = 19$, Find y when $x = 1$.
 - a. 4
 - b. 3
 - c. 2
 - d. -3
- 4) The NAV of a unit in mutual fund scheme is 9.25, then find the amount required to buy 400 such units.
 - a. Rs. 3,800
 - b. Rs. 3,700
 - c. Rs. 3,725
 - d. Rs. 3,885

B) Solve the following questions. (4)

- 1) Make the classes exclusive 11-20, 21-30.

- 2) If the following sequences are A.P.? then find the common difference. 2, 4, 6, 8,
- 3) If the total value of the mutual fund scheme is Rs. 200 crores and 8 crore units are issued then find the NAV of one unit.
- 4) For the equation $4x + 5y = 20$, find y when $x = 0$.

Q.2 : A) Complete the following activities. (Any Two) (4)

- 1) The following table shows the daily supply of electricity to different places in a town. To show the information by a pie diagram, measures of central angles of sectors are to be decided. Find the measures.

Places	Supply of electricity (Thousand units)	Measure of central angle
Roads	4	$\frac{4}{30} \times 360 = 48^\circ$
Factories	12	$\square \times 360 = 144^\circ$
Shops	6	$\frac{6}{30} \times 360 = \square$
Houses	8	$\square \times 360 = \square$
Total	30	$\square ?$

- 2) If (2, 0) is the solution of $2x + 3y = k$, then find the value of k by completing the activity.

Solution:

(2, 0) is solution of the equation $2x + 3y = k$

Putting $x = \square$ and $y = \square$ in equation

$$\therefore 2(\square) + 3 \times 0 = k$$

$$\therefore 4 + 0 = k$$

$$\therefore k = \square$$

- 3) Shri Shantilal has purchased 150 shares of FV Rs. 100, for MV of Rs. 120. Company has paid dividend at 7%. Find the rate of return on his investment.

Face value of share = Rs. 100

Dividend on one share = 7% of Rs. 100

$$= \frac{7}{100} \times 100$$

$$= \text{Rs. } \square$$

$$\therefore \text{Dividend on 150 shares} = \square \times 7$$

$$= \text{Rs. } 1050$$

Market value of share = Rs. 120

$$\therefore \text{Total investment} = 150 \times 120$$

$$= \text{Rs. } \square$$

$$\therefore \text{Rate of return} = \square \times 100$$

$$= \square \times 100$$

$$\therefore \text{Rate of return} = \square$$

B) Solve the following questions. (Any four) (8)

- 1) Form the given table, find the median number of rooms occupied per day in a hotel:

Number of rooms occupied	Number of days (f)	(c.f.) (less than types)
0 – 10	5	5
10 – 20	15	20
20 – 30	25	45
30 – 40	10	55
40 – 50	5	60

- 2) Find the amount received when 300 shares of FV Rs. 100, were sold at a discount of Rs. 30.

- 3) A card is drawn from well shuffled pack of 52 playing cards. Find the probability that the card drawn is a face card

- 4) Solve the following simultaneous equations.

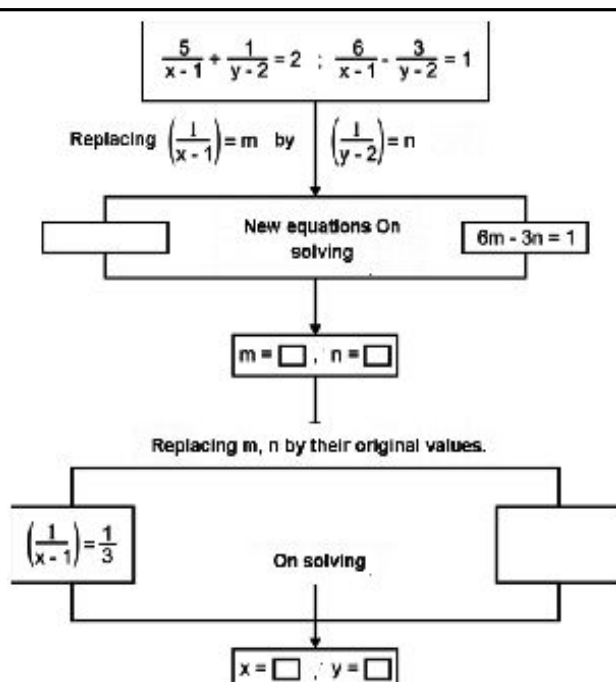
$$5m - 3n = 19 ; m - 6n = -7$$

- 5) Determine the nature of roots of the following quadratic equations from their discriminant.

$$m^2 + 2m + 9 = 0$$

Q.3 : A) Complete the following Activity (Any one) (3)

- 1) To solve given equations fill the boxes below suitably.



$\therefore (x, y) = (,)$ is the solution of the given information simultaneous equations.

2) A die is thrown. Find the probability of getting:

- an odd number.
- a perfect square.
- a number greater than 3.

Let S be the sample space. Then $S =$

$$\{\square\}$$

$$\therefore n(S) = 6.$$

i. Let A be the event of getting an odd number.

$$\text{Then } A = \{\square\} \quad n(A) = 3$$

$$P(A) = \frac{n(A)}{n(S)} \quad \therefore P(A) = \frac{3}{6} = \frac{1}{2}.$$

ii. Let B be the event of getting a perfect square.

$$\text{Then } B = \{\square\} \quad \therefore n(B) = 2$$

$$P(B) = \frac{n(B)}{n(S)} \quad \therefore P(B) = \frac{2}{6} = \frac{1}{3}$$

iii. Let C be the event of getting a number greater than 3.

$$\text{Then } C = \{\square\} \quad \therefore n(C) = 3$$

$$P(C) = \frac{n(C)}{n(S)} \quad \therefore P(C) = \frac{3}{6} = \frac{1}{2}.$$

B) Solve the following questions. (Any two) (6)

1) Solve the following equations by Cramer's method.

$$6x - 3y = -10; 3x + 5y - 8 = 0$$

2) Check the following is quadratic equation or not.

$$(x + 2)^2 = 2x^2$$

3) Two different dice are thrown simultaneously. Find the probability if getting:

- sum 7
- sum ≤ 3
- sum ≤ 10

4) For sequence t_n if $S_n = \frac{n}{n+1}$ then find the first three terms of t_n

Q.4 : Solve the following questions. (Any two) (8)

1) A tank can be filled up by two taps in 6 hours. The smaller tap alone takes 5 hours more than the bigger tap alone. Find the time required by each tap to fill the tank separately.

2) In a tree plantation programme, the number of trees planted by students of different classes is given in the following table. Draw a pie diagram showing the information.

Standard	5 th	6 th	7 th	8 th	9 th	10 th
No. of trees	40	50	75	50	70	75

- 3) There are 37 terms in an A.P., the sum of three terms placed exactly at the middle is 225 and the sum of last three terms is 429. Write the A.P.

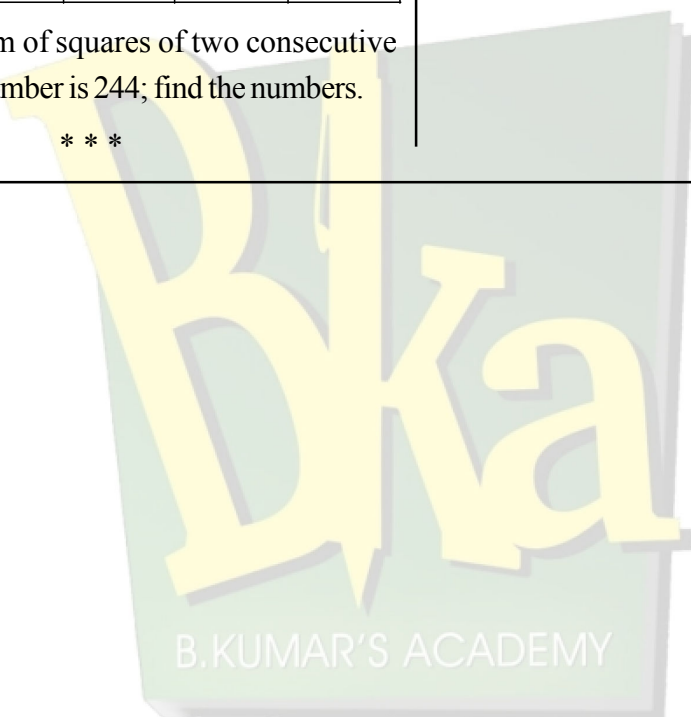
Q.5 : Solve the following questions.
(Any one) (3)

- 1) Calculate the mode:

Number of absent days	0–10	10–20	20–30	30–40
Number of students	30	90	50	40

- 2) The sum of squares of two consecutive even number is 244; find the numbers.

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B.KUMAR'S ACADEMY

Pre. Question Paper - 02

Sub. : Math-I
Std. X (State Board)

Total Marks : 40
Time : 2 hours

General Instructions :

Read the following instructions carefully and follow them:

1. All questions are compulsory. 2. Use of a calculator is not allowed. 3. The numbers to the right of the questions indicate full marks. 4. In case of MCQs [Q. No. 1 (A)] only the first attempt will be evaluated and will be given credit. 5. For every MCQ, four alternatives (A), (B), (C), (D) of answers are given. Alternative of correct answer is to be written in front of the subquestion number.

Q.1 : A) Solve multiple choice questions. (4)

- 1) When a registered dealer sells goods to another registered dealer under GST, then this trading is termed as
a. BB b. B2B c. BC d. B2C
- 2) If the first term of an A.P. is -5 and the common difference is 2, then the sum of its first 6 terms is
a. 0 b. 5 c. 6 d. 15
- 3) If $\frac{1}{2}$ is a root of the quadratic equation $4x^2 - 4kx + k + 5 = 0$, Then the value of k is
a. -6 b. -3 c. 3 d. 6
- 4) Out of vowels, of the English alphabet, one letter is selected at random. the probability of selecting 'e' is
a. $\frac{1}{26}$ b. $\frac{3}{26}$ c. $\frac{1}{4}$ d. $\frac{1}{5}$

B) Solve the following questions. (4)

- 1) Compare the given quadratic equations to the general form and write values of a, b, c.

$$y^2 = 7y$$

- 2) Decide whether the following equation is quadratic equations or not.
 $(m + 2)(m - 5) = 0$
- 3) In a hockey team there are 6 defenders, 4 offenders and 1 goalee. Out of these, one player is to be selected randomly as a captain. Find the probability of the selection that - The goalee will be selected.
- 4) Solve the following quadratic equations by factorisation.

$$m^2 - 11 = 0$$

Q.2 : A) Complete the following activities. (Any Two) (4)

- 1) Two coins are tossed simultaneously. Write the sample space (S) and expected sample points in the given events by completing the activity.
(i) Event A : to get at least one head.
(b) Event B : to get no head.

Let 'S' be the sample space when two coins are tossed simultaneously.

$$\therefore S = \{\square, HT, TH, \square\}$$

Event A : to get at least one head.

$$\therefore A = \{HH, \square, TH\}$$

Event B : to get no head.

$$B = \{\square\}$$

- 2) Determine the nature of roots of the following quadratic equations from their discriminant.

$$x^2 - 4x + 4 = 0$$

Comparing with $ax^2 + bx + c = 0$ we get,

$$a = 1, b = -4, c = 4$$

$$\Delta = \square$$

$$= \square^2 - 4 \times 1 \times 4$$

$$= 16 - 16$$

$$\therefore \Delta = 0$$

As $\Delta = \square$, the roots of the quadratic

equations are $\square$

- 3) By completing the following table, find mean turnover of the stores.

Class Turnover (RS. in lakh)	Class mark x_i	Frequency (No. of stores) f_i	Frequency $\times$ Class mark $f_i x_i$
5-15	10	5	50
15-25	20	10	200
25-35	30	20	600
35-45	40	13	$\square$
45-55	50	2	100
Total	-	$\square$	$\square$

$$\text{mean } \bar{x} = \frac{\sum f_i x_i}{\sum f_i}$$

....(Formula)

$$= \square$$

**B) Solve the following questions.
(Any four) (8)**

- 1) If a card is drawn from a pack of 52 cards, find the probability of the following events:

(i) Event A : not getting a black card.

(ii) Event B : getting a card bearing numbers from 2 to 5.

- 2) Krishna Electricals had bought a TV from a wholesaler at Rs. 36,000. The marked price on it in Krishna Electricals was Rs. 50,000. If it was sold to Kalyan Deshmukh at 10% discount, "calculate the input GST and output GST for Krishna Electricals if the rate of GST is 18%.

- 3) 11, 8, 5, 2, ... In this A.P. which term is number -151 ?

- 4) Find the value of the following determinants.

$$N = \begin{vmatrix} -8 & -3 \\ 2 & 4 \end{vmatrix}$$

- 5) Solve the following quadratic equation by factorization.

$$m^2 - 14m + 13 = 0$$

**Q.3 : A) Complete the following activity
(Any one) (3)**

- 1) Fill in the boxes with the help of the given information:

Tax invoice of services provided (Sample)									
Food Junction, Khed - Shivapur, Pune								Invoice no. 58	
Mob no. 7588580000, email - ahar.khed@yahoo.com									
GSTIN: 27AAAAA5555B1ZA						Invoice Date: 25 Feb., 2020			
SAC	Food items	Qty	Rate (in Rs.)	Taxable amount	CGST	SGST			
9963	Coffee	1	20	20.00	2.5%	Rs. 0.50	2.5%		
9963	Masala Tea	1	10	10.00		Rs. 0.25	2.5%		
9963	Masala Dosa	2	60		2.5%		2.5%	Rs. 3.00	
			Total	150.00				Rs. 3.75	
Grand Total						Rs. 157.50			

2) Complete the following table.

Age group (in years)	No. of persons	Measure of central angle
5 – 10	5	$\frac{5}{150} \times 360^\circ = \square$
11 – 15	45	$\frac{45}{150} \times 360^\circ = \square$
16 – 20	60	$\frac{60}{150} \times \square = 144^\circ$
21 – 25	40	$\frac{40}{150} \times 360^\circ = \square$
Total	150	$\square$

B) Solve the following questions. (Any two) (6)

- For an A.P. $\frac{1}{6}, \frac{1}{4}, \frac{1}{3}, \dots$ find t_{20} and S_{10} .
- Prepare the tax invoices W2D, D2R, and R2C for the following trading chain. GST is 28%.



- Solve the following simultaneous equations using Cramer's method.

$$3x - 4y = 10; 4x + 3y = 5$$

- A tyre manufacturing company decides to study the variations in mileage given by its product. The data on 100 buses is available.

Distance travelled (in thousand km)	20–40	40–60	60–80	80–100	100–120
Number of buses	8	25	40	24	3

Find the median distance travelled by a bus.

Q.4 : Solve the following questions. (Any two) (8)

- Mr. Kasam runs a small business of making earthen pots. He makes certain number of pots on daily basis. Production cost of each pot is Rs.40 more than 10 times total number of pots, he makes in one day. If production cost of all pots per day is Rs. 600, find production cost of one pot and number of pots he makes per day.
- Represent the following data using a histogram:

Height of Students (in cm)	140–144	145–149	150–154	155–159
Number of students	2	12	10	4

- Solve the following simultaneous equations graphically.

$$5x - 6y + 30 = 0; 5x + 4y - 20 = 0$$

Q.5 : Solve the following questions. (Any one) (3)

- The 19th term of an A.P. is equal to three times its 6th term. If its 9th term is 19, find the A.P.
- Draw the graph of $x + y = 6$ which intersects the X-axis and the Y-axis at A and B respectively.

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B.K.KUMAR'S ACADEMY

Pre. Question Paper - 03

Sub. : Math-I
Std. X (State Board)

Total Marks : 40
Time : 2 hours

General Instructions :

Read the following instructions carefully and follow them:

1. All questions are compulsory. 2. Use of a calculator is not allowed. 3. The numbers to the right of the questions indicate full marks. 4. In case of MCQs [Q. No. 1 (A)] only the first attempt will be evaluated and will be given credit. 5. For every MCQ, four alternatives (A), (B), (C), (D) of answers are given. Alternative of correct answer is to be written in front of the subquestion number.

Q.1 : A) Solve multiple choice questions. (4)

- 1) If the face value of a share is Rs. 10 and the market value is Rs. 18, then which of the following statements is correct ?
 - a. The share is at a premium of Rs. 18
 - b. The share is at a discount of Rs. 18
 - c. The share is at a premium of Rs. 8
 - d. The share is at a discount of Rs. 8
- 2) The tax levied by the central government for trading within state is
 - a. IGST b. CGST c. SGST d. UTGST
- 3) To draw the graph of $x + 2y = 4$, find x when $y = 1$:
 - a. 1 b. 2 c. -2 d. 6
- 4) Cumulative frequencies in a grouped frequency table are useful to find.....
 - a. Mean b. Median
 - c. Mode d. All of these

B) Solve the following questions. (4)

- 1) If $\frac{a}{4} + \frac{b}{3} = 4$, write the equation in

standard form.

- 2) How many possibilities are there in the following case?
Select one card from the pack of 52 cards.
- 3) Obtain the quadratic equation if roots are $-3, -7$.
- 4) If the following sequences is A.P. then find the common difference.
 $0, -4, -8, -12, \dots$

Q.2 : A) Complete the following activities. (Any Two) (4)

- 1) Two-digit numbers are formed from the digits 0, 1, 2, 3 where the digits are not repeated.
 - i. A is the event that the number formed is an odd number.
 - ii. B is the event that the number formed is an even number.

$$B = \{ \square \}$$

$$\therefore n(B) = \square$$

As we have to form two-digit numbers, 0 cannot be at the tens place.

The sample space $S = \{10, 12, 13, 20, 21, 23, 30, 31, 32\}$.

$$\therefore n(S) = 9$$

- i. A is the event that the number formed is an odd number.

$$\therefore A = \{\square\}. \quad \therefore n(A) = \square.$$

- ii. B is the event that the number formed is an even number.

$$\therefore B = n(B) = \square. \quad \therefore \{\square\}.$$

- 2) First term and common difference of an A.P. are 6 and 3 respectively ; find S_{27} .

$$a = 6, d = 3, S_{27} = ?$$

$$\therefore S_n = \frac{n}{2} [\square + (n-1)d]$$

$$\therefore S_{27} = \frac{27}{2} [12 + (27-1) \square]$$

$$= \frac{27}{2} \times \square$$

$$= 27 \times 45$$

$$\therefore S_{27} = \square$$

- 3) The following table shows the daily supply of electricity to different places in a town. To show the information by a pie diagram, measures of central angles of sectors are to be decided. Find the measures.

Places	Supply of Electricity (Thousand units)	Measure of central angle
Roads	4	$\frac{4}{30} \times 360 = 48^\circ$
Factories	12	$\frac{\square}{\square} \times 360 = 144^\circ$
Shops	6	$\frac{6}{30} \times 360 = \square$
Houses	8	$\frac{\square}{\square} \times 360 = \square$
Total	30	$\square$

B) Solve the following questions. (Any four) (8)

- 1) There are 21 rows of seats in an auditorium. The first row is of 20 seats, the second of 22 seats, the third of 24 seats, and so on. How many chairs are there in the 21st row?

- 2) Find the value of discriminant for the following equation.

$$\sqrt{5}x^2 - x - \sqrt{5} = 0$$

- 3) The following table shows classification of number of workers and the number of hours they work in a software company. Find the median of the number of hours they work.

Daily No. of hours	8 - 10	10 - 12	12 - 14	14 - 16
Number of workers	150	500	300	50

- 4) Solve the following simultaneous equations.

$$2x - 3y = 9; 2x + y = 13$$

- 5) Six faces of a die are as shown below.

A B C D E A

If the die is rolled once, find the probability of -

- 1) 'A' appears on upper face.
2) 'D' appears on upper face.

Q.3 : A) Complete the following activity (Any one) (3)

- 1) The amount with Mukund is Rs. 50 more than amount with Sagar. The product of the amount is 15000, then find the amounts with each of them.

Let the amount with Sugar be Rs. x.

$\therefore$ The amount with Mukund is Rs. (x + 50)

According to given condition

$$\square = 15000 \dots (\text{given condition})$$

$$\therefore \square = 15000$$

$$\therefore x^2 + 50x - 15000 = 0$$

$$\therefore x^2 + 150x - 100x - 15000 = 0$$

$$\therefore x(x + 150) - 100(x + 150) = 0$$

$$\therefore x + 150 = 0 \text{ or } x - 100 = 0$$

$$\therefore x = \square \text{ or } x = 100$$

$x \neq -150$ amount in rupees can not be negative.

$$\therefore x = 100 \text{ and } x + 50 = 100 + 50 = \square$$

The amount with Sagar is $\square$ and amount

with Mukund is $\square$

2) Find the mean by step deviation method.

Daily Income (in Rs.)	0 - 100	100 - 200	200 - 300	300 - 400	400 - 500
Number of men	12	28	34	41	50

Daily income (in Rs.)	Number of mean c.f.	Class Mark x_i	$d_i = x_i - A$ $d_i = x_i - 250$	Deviations $u_i = \frac{d_i}{g}$ $u_i = \frac{d_i}{100}$	Frequency (Number of men) f_i	$f_i u_i$
0 - 100	12	50	-200	-2	12	-24
100 - 200	28	150	-100	-1	28 - 12 = 16	-16
200 - 300	34	$\square$	$\square$	0	34 - 28 = 6	0
300 - 400	41	350	100	1	41 - 34 = 7	7
400 - 500	50	450	200	2	50 - 41 = 9	18
Total					$\sum f_i = \square$	$\sum f_i u_i = -15$

$$\text{Here, } \sum f_i = \square, \sum f_i u_i = -15.$$

$$\therefore \bar{u} = \left(\frac{\sum f_i u_i}{\sum f_i} \right) g = \square$$

$$\therefore \text{mean } (\bar{x}) = A + \bar{u}$$

$$\therefore \text{mean } (\bar{x}) = \square$$

B) Solve the following questions. (Any two) (6)

1) A two digit number is to be formed from the digits 0, 1, 2, 3, 4. Repetition of the digits is allowed. Find the probability that the number so formed is a -

1) prime number

2) multiple of 4

3) multiple of 11.

2) Solve the following simultaneous equations using Cramer's method.

$$2x + 3y = 2 ; x - \frac{y}{2} = \frac{1}{2}$$

3) Market value of shares and dividend declared by the two companies is given below. Face Value is same and it is Rs. 100 for both the shares. Investment in which company is more profitable.

1) Company A - Rs. 132, 12%

2) Company B - Rs. 144, 16%

4) Solve quadratic equations using formula. $25x^2 + 30x + 9 = 0$

Q.4 : Solve the following questions. (Any two) (8)

1) Smt. Anagha Doshi purchased 22 shares of FV Rs. 100 for Market Value of Rs. 660. Find the sum invested. After taking 20% dividend, she sold all the shares when market value was Rs. 650. She paid 0.1% brokerage for each trading done. Find the percent of profit or loss in the share trading. (Write your answer to the nearest integer.)

2) Solve the following simultaneous equations.

$$\frac{7x-2y}{xy} = 5; \frac{8x+7y}{xy} = 15$$

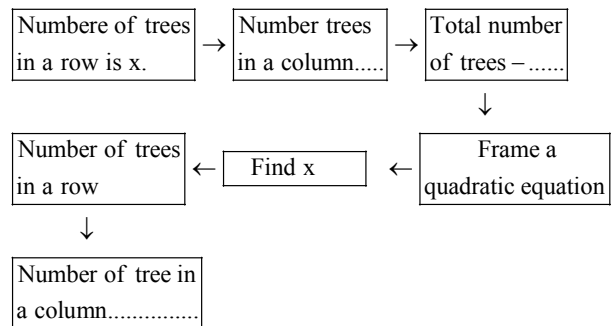
- 3) Automatic filling machine was tested for its performance A sample 100 filled packets generated the data, Which is classified as follows and Draw histogram.

Weight (in gm)	485-490	490-495	495-500	500-505	505-510	510-515
No. of Packets	12	18	20	22	24	4

Q.5 : Solve the following questions.
(Any one) (3)

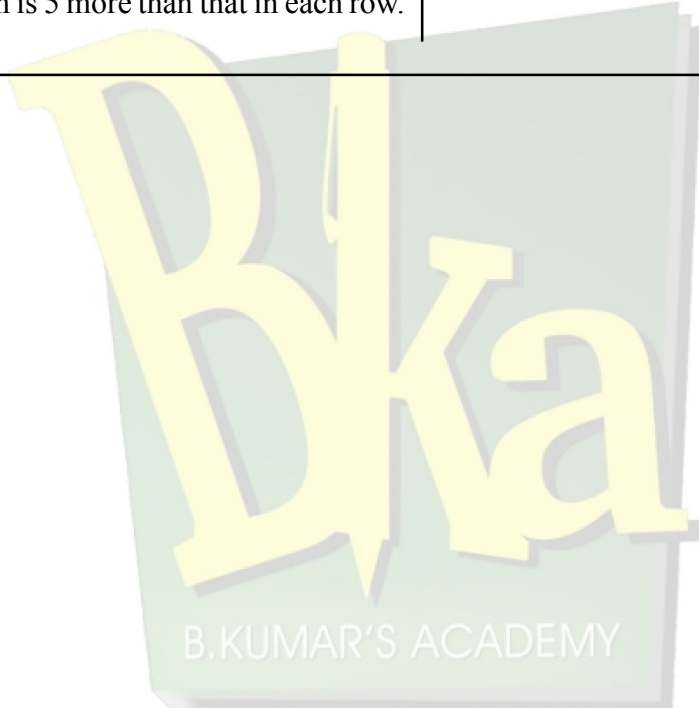
- 1) In an orchard, the number of trees in each column is 5 more than that in each row.

Find the number of trees in each column.
If the total number of trees is 1400.



- 2) i. Write an A.P. in which $a = 10$ and d is any natural number.
ii. Find the sum of the first ten terms using formula.
iii. Can - 80 be a term of this A.P. ? Justify.

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B.KUMAR'S ACADEMY

Pre. Question Paper - 04

Sub. : Math-I
Std. X (State Board)

Total Marks : 40
Time : 2 hours

General Instructions :

Read the following instructions carefully and follow them:

1. All questions are compulsory. 2. Use of a calculator is not allowed. 3. The numbers to the right of the questions indicate full marks. 4. In case of MCQs [Q. No. 1 (A)] only the first attempt will be evaluated and will be given credit. 5. For every MCQ, four alternatives (A), (B), (C), (D) of answers are given. Alternative of correct answer is to be written in front of the subquestion number.

Q.1 : A) Solve multiple choice questions. (4)

- 1) The sum of the digits of a two digit number is 9. If 27 is added to it, the digits of the number get reversed. The number is.

a. 27 b. 72
c. 63 d. 36

- 2) $\sqrt{5}m^2 - \sqrt{5}m + \sqrt{5} = 0$ which of the following statement is true for this given equation ?

a. Real and unequal roots
b. Real and equal roots
c. Roots are not real
d. Three roots

- 3) If Median = 2116.67, L = 1950, f = 21, h = 500 and c.f. = 53, then N = ?

a) 12 b) 1200
c) 120 d) 12.67

- 4) The 11th term of the A.P. $-3, -\frac{1}{2}, 2, \dots$ is

a. 28 b. 22
c. -38 d. -48

B) Solve the following questions. (4)

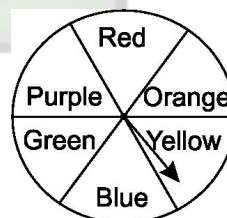
- 1) If for the given values.

c. f. = 22, L = 30 f = 18, h = 10, N = 70 then find median

- 2) If 50 shares of FV Rs. 100 each are purchased for MV Rs. 120. Find the sum invested.

- 3) Write an A.P. whose first term is a and common difference is d in each of the following. a = -1.25, d = 3

4)



The arrow is rotated and it stops randomly on the disc. Find out on which colour it may stop.

Q.2 : A) Complete the following activities. (Any Two) (4)

- 1) Ajay purchased 500 shares of MV Rs. 50 Brokerage paid at the rate of 0.5% and rate of GST on brokerage is 18%. Find the total amount he paid for the share purchase.

$$\text{Total MV} = \text{No. of shares} \times \text{MV per share} \\ = 500 \times 50$$

$$= \text{Rs. } \boxed{}$$

$$\text{Brokerage} = 0.5\% \times 25000$$

$$= \frac{0.5}{100} \times 25000$$

$$= \boxed{}$$

$$\text{GST on Brokerage} = \frac{18}{100} \times 125$$

$$= \boxed{}$$

$$\text{Total Amount Paid} = \text{Rs. } 25,000 + 125 + 22.5$$

$$= \text{Rs. } \boxed{}$$

- 2) By completing the following table, find mean turnover of the stores.

Class Turnover (RS. in lakh)	Class mark x_i	Frequency (No. of stores) f_i	Frequency $\times$ Class mark $f_i x_i$
5–15	10	5	50
15–25	20	10	200
25–35	30	20	600
35–45	50	13	$\boxed{}$
45–55	50	2	100
Total	–	$\boxed{}$	$\boxed{}$

$$\text{Mean } \bar{x} = \frac{\sum f_i x_i}{\sum f_i} \dots (\text{Formula})$$

$$= \boxed{}$$

- 3) A box contains 5 red, 8 blue and 3 green pens. Rutuja wants to pick a pen at random. What is the probability that the pen is blue?

$$\text{Total number of pens} = 5 \text{ red} + 8 \text{ blue} + 3 \text{ green} = 16$$

$$\therefore \text{Total number of sample points} = n(S) \\ = \boxed{}$$

Event A : A blue pen is picked up

There are 8 blue pens.

$$\therefore n(A) = \boxed{}$$

$$P(A) = \frac{n(A)}{n(S)}$$

$$\therefore P(A) = \boxed{}$$

$$= \boxed{}$$

$$\therefore \text{Probability of getting a blue pen is } \boxed{}$$

**B) Solve the following questions.
(Any four) (8)**

- Form a quadratic equation whose roots are 4 and -12.
- Find the values of the following determinants.

$$N = \begin{vmatrix} -8 & -3 \\ 2 & 4 \end{vmatrix}$$

- Find the 27th term of the following A.P.
9, 4, -1, -6, -11.....
- There are 2 red, 3 blue and 4 green balls, of the same size, in a box. One ball is drawn at random from the box.
 - A is the event of getting a red ball.
 - C is the event of getting a red or blue ball.
- Prasad purchased a share of face value Rs. 100 when its market price was Rs. 150. Company declared a dividend of 12% on the share. What was the rate of return on the investment Prasad made?

Q.3 : A) Complete the following activity (Any one) (3)

- 1) Shikha works in a factory. In one week she earned Rs. 390 for working 47 hours. of which 7 hours were overtime. The next week she earned Rs. 416 for working 50 hours, of which 8 hours were overtime. What is Shikha's hourly earning rate?

Let Shikha's earning be Rs. x per regular hour and Rs. y per hour overtime, then according to first condition of given problem, $\square$ (1)

According to second condition of given problem, $42x + 8y = 416$ (2)

Multiplying equation (1) by 8 and equation (2) by 7

$$320x + 46y = 3120$$

$$294x + 56y = 2913$$

$$\begin{array}{r} - \quad - \quad - \\ 26x \quad = 208 \end{array}$$

$$x = \frac{208}{26}$$

$$x = \square$$

Substituting the value of x in equation (1),

$$\text{we get } \square = 390$$

$$320 + 7y = 390$$

$$7y = 390 - 320$$

$$7y = 70$$

$$y = \square$$

Hence, Shika's earning be Rs. $\square$ per regular hours and Rs. $\square$ per hour overtime.

- 2) The product of ages of Pragati 2 years ago and 3 years after is 84. Find her present age. Let the present age of Pragati be x years.

$$\text{Pragati's age 2 years ago} = \square \text{ years and}$$

$$3 \text{ years after} = \square \text{ years}$$

According to given condition

$$(x - 2)(x + 3) = 84$$

$$\therefore x(x + 3) - 2(x + 3) = 84$$

$$\therefore \square = 84$$

$$\therefore x^2 + x - 6 - 84 = 0$$

$$\therefore x^2 + x - 90 = 0$$

$$\therefore \square = 0$$

$$\therefore x(x + 10) - 9(x + 10) = 0$$

$$\therefore (x + 10)(x - 9) = 0$$

$$\therefore x + 10 = 0 \text{ or } x - 9 = 0$$

$$\therefore x = -10 \text{ or } x = 9$$

Now age cannot be negative

$$\therefore x \neq -10$$

$$\therefore x = \square$$

The present age of Pragati is $\square$ years.

B) Solve the following questions. (Any two) (6)

- 1) Solve the following simultaneous equations using Cramer's method.

$$x + 2y = -1 ; 2x - 3y = 12$$

- 2) How many of the three digit natural numbers are divisible by 5?

- 3) Fill in the blanks given in the contract note of sale-purchase of shares. (B - buy S - sell)

No. of shares	MV of shares	Total value	Brokerage 0.2%	9% CGST on brokerage	9% SGST on brokerage	Total value of shares
75 S	Rs. 200					

- 4) Solve the following quadratic equation.

$$x^2 + 10x + 2 = 0$$

Q.4 : Solve the following questions. (Any two) (8)

- 1) Solve the following simultaneous equations graphically.
 $3x - y - 2 = 0$; $2x + y = 8$
- 2) Draw histogram and frequency polygon for the following data :

Body mass index	18-19	19-20	20-21	21-22	22-23	23-24
No. of persons	5	12	18	25	16	4

- 3) Pratik travels by boat 36 km down a river and back in 8 hours. If the speed of his boat in still water is 12 km/hr, find the speed of the river current.

Q.5 : Solve the following questions. (Any one) (3)

- 1) A missing helicopter is reported to have crashed somewhere in the rectangular

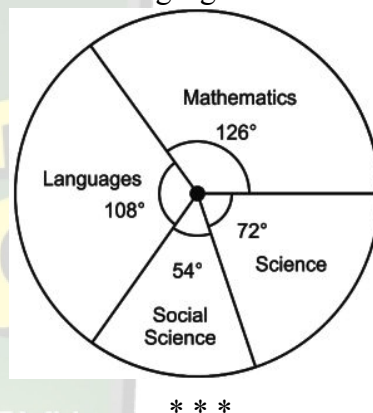
region with dimension 9×4.5 km. There was a lake of dimension 3×2.5 km in one of the corner of the rectangular region.

1. Draw the figure to represent the above information.

2. Find the probability that the helicopter crashed inside the lake.

- 2) A survey was conducted in Aadarsh Vidyalaya to know the inclination of students towards different subjects. The data obtained is presented by the adjacent pie diagram. If the total number of students was 500, answer the following questions.

- i) How many students show inclination towards mathematics ?
- ii) How many students are inclined towards social sciences ?
- iii) How many more students are inclined towards languages than science ?





B.K. KUMAR'S ACADEMY

Pre. Question Paper - 05

Sub. : Math-I
Std. X (State Board)

Total Marks : 40
Time : 2 hours

General Instructions :

Read the following instructions carefully and follow them:

1. All questions are compulsory. 2. Use of a calculator is not allowed. 3. The numbers to the right of the questions indicate full marks. 4. In case of MCQs [Q. No. 1 (A)] only the first attempt will be evaluated and will be given credit. 5. For every MCQ, four alternatives (A), (B), (C), (D) of answers are given. Alternative of correct answer is to be written in front of the subquestion number.

Q.1 : A) Solve multiple choice questions. (4)

1) Which one is a quadratic equation?

- a. $\frac{5}{x} - 3 = x^2$ b. $x(x+5) = 2$
c. $n - 1 = 2n$ d. $\frac{1}{x^2}(x+2) = x$

2) The roots of $x^2 + kx + k = 0$ are real equal, find k.

- a. 0 b. 4
c. 0 or 4 d. 2

3)

Distance Covered per litre (km)	12 - 14	14 - 16	16 - 18	18 - 20
No. of cars	11	12	20	7

The median of the distances covered per litre shown in the above data is in the group

.....

- a. 12 - 14 b. 14 - 16
c. 16 - 18 d. 18 - 20

4) If for any A.P. $d = 5$ then $t_{18} - t_{13} = \dots\dots\dots$

- a. 5 b. 20
c. 25 d. 30

B) Solve the following questions. (4)

1) If $n(A) = 2$, $P(A) = \frac{1}{5}$, then $n(S) = ?$

2) 'Pawan Medical' supplies medicines. On some medicines the rate of GST is 12%, then what is the rate of CGST and SGST?

3) How many possibilities are there in each of the following?

One number from 10 to 20 is written on each card. Select one card randomly.

4) Find the sum of first n natural numbers.

Q.2 : A) Complete the following activities. (Any Two) (4)

1) In a class of 42 students in Model High School, 3 students use spectacles. Fill in the following boxes to find the probability of a students selected at random wearing spectacles.

The total number of students in the class is 42.

$\therefore n(S) = \square$

Let the event, a student uses spectacles, be A.

$$\therefore n(A) = \square$$

$$\therefore P(A) = \square = \frac{3}{42}$$

$$\therefore P(A) = \square$$

- 2) Nazama is a proprietor of a firm, registered under GST. She has paid GST of Rs. 12,500 on purchase and collected Rs. 14,750 on sale. What is the amount of ITC to be claimed? What is the amount of GST payable?

Tax paid while purchase = Rs. 12,500

i.e. Tax Input Credit (ITC) = Rs. 12,500

Tax collected while sale (output tax) = Rs. 14,750

$$\therefore \text{GST} = \square \text{ formula}$$

$$= 14,750 - \square$$

$$\therefore \text{GST} = \square$$

$\therefore$ Input tax credit for Nazma is Rs. 12,500

and GST to be paid is Rs. $\square$

- 3) Fill up the boxes and find out the number of terms in the A. P. 1, 3, 5,, 149.

$$\text{Here } a = 1, d = \square, t_n = 149$$

$$t_n = a + (n - 1) d$$

$$\therefore 149 = \square$$

$$149 = 1 + 2n - 2$$

$$\therefore 149 = 2n - \square$$

$$\therefore 2n = 150$$

$$\therefore n = \square$$

B) Solve the following questions.
(Any four) (8)

1) If the value of the determinant $\begin{vmatrix} 4 & m \\ 2 & 7 \end{vmatrix}$ is

34. Find the value of m.

- 2) A dividend of 6% was declared on a share of FV Rs. 100 at a certain price. If the rate of return is 8%, calculate MV of the share. How many shares would a person get on investing Rs. 7500?

- 3) Find the sum of first 100 terms of A.P.

14, 16, 18, ...

- 4) A bag contains 50 cards. Each card bears only one number from 1 to 50. One card is drawn at random from the bag. Write the sample space. Also write the events A, B and find the number of sample points in them.

i) Condition for event A : The number on the card is divisible by 6.

ii) Condition for event B : The number on the card is a complete square.

- 5) $2x^2 - 7x + 6 = 0$ check whether $x = -2$ is the solution of the equation.

Q.3 : A) Complete the following activity
(Any one) (3)

- 1) Complete the following table.

Age group (in years)	No of persons	Measure of central angle
5-10	5	$\frac{\square}{150} \times 360^\circ = \square$
11-15	45	$\frac{45}{150} \times 360^\circ = \square$
16-20	60	$\frac{60}{150} \times \square = 144^\circ$
21-25	40	$\frac{40}{150} \times 360^\circ = \square$
Total	150	$\square$

- 2) Complete the following activity to solve simultaneous equations.

$$5x + 3y = 9 \text{ ----- I}$$

$$2x - 3y = 12 \text{ ----- II}$$

Let's add equation (I) and (II)

$$\begin{array}{r} 5x + 3y = 9 \\ + 2x - 3y = 12 \\ \hline \end{array}$$

$$x = \frac{\boxed{}}{\boxed{}} \quad x = \boxed{}$$

put $x = 3$ in eqⁿ (I)

$$5 \times \boxed{} + 3y = 9$$

$$3y = 9 - \boxed{}$$

$$3y = \boxed{}$$

B) Solve the following questions. (Any two) (6)

- Shri. Aditya Sanghavi invested Rs. 50,118 in shares of FV Rs. 100, when the market value is Rs. 50. Rate of brokerage is 0.2% and Rate of GST on brokerage is 18%, then How many shares were purchased for Rs. 50,118?
- A tyre manufacturing company decides to study the variations in mileage given by its product. The data on 100 buses is available.

Distance travelled (in thousand km)	20 - 40	40 - 60	60 - 80	80 - 100	100 - 120
Number of buses	8	25	40	24	3

Find the median distance travelled by a bus.

- Solve : $15x + 17y = 21$; $17x + 15y = 11$

- A balloon vendor has 2 red, 3 blue and 4 green balloons. He wants to choose one of them at random to give it to Pranali. What is the probability of the event that Pranali gets,

- a red balloon
- a blue balloon
- a green balloon.

Q.4 : Solve the following questions. (Any two) (8)

- The speed of a boat in still water is 11 km/hr. It can go 12 km up-stream and return downstream to the original point in 2 hours 45 minutes. Find the speed of the stream.
- The following table shows the daily supply of electricity to different places in a town. Show the information by a pie diagram.

Places	Factories	Houses	Roads	Shops	Offices	Others
Supply of electricity (Thousand units)	24	14	7	5	6	4

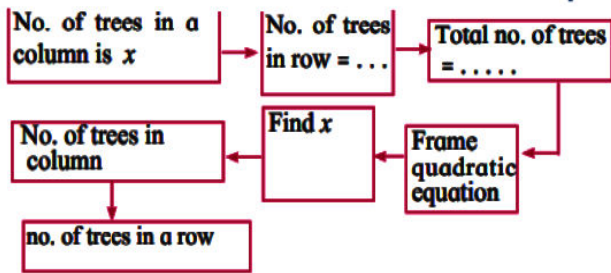
3) Solve the following simultaneously equations graphically. (3)

$$3x - 4y = 7;$$

$$5x - 2y = 0$$

Q.5 : Solve the following questions. (Any one) (3)

- In the orange garden of Mr. Madhusudan there are 150 orange trees. The number of trees in each row is 5 more than that in each column. Find the number of trees in each row and each column with the help of following flow chart.



- 2) Construct a word problem on linear equation in two variables (age related problem) so that one answer will be 1. Solve the problem you have constructed.

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