10TH STANDARD MATHS 1

QUESTION WISE PYQ

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SERIES 2026

10th Standard | Maths 1 | Question wise PYQ

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Q.1. (A) **Four alternative answers are given for every subquestion. Choose the correct alternative and write its alphabet with subquestion number:** **[4]**

i. The value of determinant $\begin{vmatrix} 5 & 3 \\ -7 & -4 \end{vmatrix}$ is _____.

(A) -1 (B) -41
(C) 41 (D) 1

ii. Out of the following equations which one is not a quadratic equation?
(A) $x^2 + 4x = 11 + x^2$ (B) $x^2 = 4x$
(C) $5x^2 = 90$ (D) $2x - x^2 = x^2 + 5$

iii. For given A.P. a = 3.5, d = 0, then t_2 = _____.
(A) 0 (B) 3.5
(C) 7 (D) 10.5

iv. From the following numbers which number cannot represent a probability?
(A) 0.6 (B) 2.0
(C) 0.15 (D) 0.75

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Q.1. (A) **Choose the correct alternative from given:** **[4]**

i. $\begin{vmatrix} 1 & 2 \\ 3 & 4 \end{vmatrix}$. Write the degree of the given determinant.

(A) 1 (B) 2
(C) 3 (D) 4

ii. From the following equations which one is the quadratic equation?

(A) $\frac{5}{x} - 3 = x^2$ (B) $x(x+5) = 2$

(C) $n - 1 = 2n$ (D) $\frac{1}{x^2}(x+2) = x$

iii. Find the common difference of the following A.P.:
4, 4, 4, …
(A) 1 (B) 8
(C) 4 (D) 0

iv. Which number cannot represent a probability?

(A) $\frac{2}{3}$ (B) $\frac{15}{10}$

(C) 15% (D) 0.7

Q.1. (A) Choose the correct alternative from given: **[4]**

i. If 3 is one of the root of the quadratic equation $kx^2 - 7x + 12 = 0$, then k = _____

(A) 1 (B) –1 (C) 3 (D) –3

ii. To draw the graph of $x + 2y = 4$, find x when $y = 1$:

(A) 1 (B) 2 (C) –2 (D) 6

iii. For an A.P., $t_7 = 4$, d = –4, then a = _____

(A) 6 (B) 7 (C) 20 (D) 28

iv. In the format of GSTIN, there are _____ alpha-numerals.

(A) 9 (B) 10 (C) 15 (D) 16

Q.1. (A) Choose the correct answer and write the alphabet of it in front of the subquestion number: **[4]**

i. Sum of first five multiples of 3 is _____

(A) 45 (B) 55
(C) 15 (D) 75

ii. Find the value of determinant $\begin{vmatrix} 3 & 2 \\ 4 & 5 \end{vmatrix}$:

(A) 2 (B) 7 (C) –7 D) 23

iii. Which of the following quadratic equations has roots 3 and 5?

(A) $x^2 - 15x + 8 = 0$ (B) $x^2 - 8x + 15 = 0$
(C) $x^2 + 3x + 5 = 0$ (D) $x^2 + 8x - 15 = 0$

iv. Two coins are tossed simultaneously. Write the number of sample points n(S):

(A) 2 (B) 8 (C) 4 (D) 6

Q.1. (A) Choose the correct answer and write the alphabet of it in front of the subquestion number: **[4]**

i. To draw the graph of $4x + 5y = 19$, find y when $x = 1$:

(A) 4 (B) 3 (C) 2 (D) –3

ii. Out of the following equations which one is *not* a quadratic equation?

(A) $x^2 + 4x = 11 + x^2$ (B) $x^2 = 4x$
(C) $5x^2 = 90$ (D) $2x - x^2 = x^2 + 5$

iii. For the given A.P. a = 3.5, d = 0, then t_n = _____

(A) 0 (B) 3.5 (C) 103.5 (D) 104.5

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

(A) 10 (B) $\frac{5}{2}$ (C) $\frac{2}{5}$ (D) $\frac{1}{3}$

Q.1. (A) For every subquestion four alternative answers are given. Choose the correct answer and write the alphabet of it: **[4]**

i. For an A.P., a = 3.5, d = 0, then t_n = _____.

(A) 0 (B) 3.5 (C) 103.5 (D) 104.5

ii. Find the value of the determinant $\begin{vmatrix} 5 & 3 \\ -7 & -4 \end{vmatrix}$.

(A) –1 (B) –41 (C) 41 (D) 1

iii. Which of the following quadratic equations has roots 3 and 5?

(A) $x^2 - 15x + 8 = 0$ (B) $x^2 + 8x - 15 = 0$

(C) $x^2 + 3x + 5 = 0$ (D) $x^2 - 8x + 15 = 0$

iv. There are 40 cards in a bag. Each card bears a number from 1 to 40. One card is drawn at random. What is the probability that the card bears a number which is a multiple of 5?

(A) $\frac{1}{5}$ (B) $\frac{3}{5}$ (C) $\frac{4}{5}$ (D) $\frac{1}{3}$

Q.1. (A) Four alternative answers are given for every subquestion. Choose the *correct* alternative and write its alphabet with subquestion number. **[4]**

i. Which one is the quadratic equation?

(A) $\frac{5}{3} - 3 = x^2$ (B) $x(x + 5) = 2$

(C) n – 1 = 2n (D) $\frac{1}{x^2}(x + 2) = x$

ii. First four terms of an A.P. are _____, whose first term is –2 and common difference is –2.

(A) –2, 0, 2, 4 (B) –2, 4, –8, 16

(C) –2, –4, –6, –8 (D) –2, –4, –8, –16

iii. For simultaneous equations in variables x and y, $D_x = 49$, $D_y = -63$, D = 7, then what is the value of y?

(A) 9 (B) 7

(C) –7 (D) –9

iv. Which number cannot represent a probability?

(A) 1.5 (B) $\frac{2}{3}$

(C) 15% (D) 0.7

Q.1. (A) Four alternative answers are given for every sub-question. Choose the correct alternative and write its alphabet with sub-question number: **[4]**

i. To draw graph of $4x + 5y = 19$, what will be the value of y when $x = 1$:

(A) 4 (B) 3 (C) 2 (D) –3

ii. What is the sum of the first 10 natural numbers?

(A) 55 (B) 20 (C) 65 (D) 11

iii. From the following equations, which one is the quadratic equation?

(A) $\frac{5}{x} - 3 = x^2$ (B) $x(x + 5) = 2$ (C) n – 1 = 2n (D) $\frac{1}{x^2}(x + 2) = x$

iv. In the format of GSTIN there are _____ alpha-numerals.

(A) 9 (B) 10 (C) 16 (D) 15

Q.1. A. For every subquestion 4 alternative answers are given. Choose the correct answer and write the alphabet of it: **[4]**

i. In the format of GSTIN there are _____ alpha-numerals.

(A) 15 (B) 10

(C) 16 (D) 9

ii. From the following equations, which one is the quadratic equation?

(A) $\frac{5}{x} - 3 = x^2$ (B) $x(x + 5) = 4$

(C) $n - 1 = 2n$ (D) $\frac{1}{x^2}(x + 2) = x$

iii. For simultaneous equations in variables x and y, if $D_x = 49$, $D_y = -63$, $D = 7$, then what is the value of x?

(A) 7 (B) -7

(C) $\frac{1}{7}$ (D) $\frac{-1}{7}$

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

(A) $\frac{2}{5}$ (B) $\frac{5}{2}$

(C) 10 (D) $\frac{1}{2}$

(B) Solve the following subquestions: **[4]**

i. For simultaneous equations in variables x and y $D_x = 49$, $D_y = -63$, $D = 7$, then find the value of x.

ii. Write the following quadratic equation in standard form:
$2y = 10 - y^2$

iii. Face value of one share is ₹100 and premium is ₹10. Find the market value of the share.

iv. Find the class mark of the class 6 – 10.

(B) Solve the following subquestions: **[4]**

i. If $2x + y = 7$ and $x + 2y = 11$, then find the value of $x + y$.

ii. Find the first term of the given sequence: $t_n = 3n - 4$.

iii. How many alpha numerals are there in the format of GSTIN?

iv. Two coins are tossed simultaneously. Write the sample space S.

(B) Solve the following subquestions: **[4]**

i. If $17x + 15y = 11$ and $15x + 17y = 21$, then find the value of $x - y$.

ii. Find first term of the sequence $t_n = 3n - 2$.

iii. If the face value of a share is ₹ 100 and market value is ₹ 150. If rate of brokerage is 2%, find brokerage paid on one share.

iv. Two digit numbers are formed using digits 2, 3 and 5 without repeating a digit. Write the sample space.

(B) Solve the following subquestions: **[4]**

i. If $15x + 17y = 21$ and $17x + 15y = 11$, then find the value of $x + y$.

ii. Given sequence is an A.P. Find the next two terms of this A.P.:
5, 12, 19, 26, ……..

iii. On certain article if rate of CGST is 9%, then what is the rate of SGST and what is the rate of GST?

iv. If $n(S) = 2$ and $n(A) = 1$, then find $P(A)$.

(B) Solve the following subquestions: **[4]**

i. Find the value of the following determinant:

$$\begin{vmatrix} 4 & 3 \\ 2 & 7 \end{vmatrix}$$

ii. Find the common difference of the following A.P.:
2, 4, 6, 8, …

iii. On certain article if rate of CGST is 9%, then what is the rate of SGST?

iv. If one coin is tossed, write the sample space 'S'.

(B) Solve the following subquestions: **[4]**

i. The sum of father's age and twice the age of his son is 70. Use the given information to form a linear equation in two variables.

ii. A die is thrown. Write sample space.

iii. Find the roots of the quadratic equation $(x + 5)(x - 4) = 0$.

iv. Find the first term and common difference for an A.P., 127, 135, 143, 151, … .

(B) Solve the following subquestions: **[4]**

i. To draw a graph of $4x + 5y = 19$, find y when $x = 1$.

ii. Determine whether 2 is a root of quadratic equation $2m^2 - 5m = 0$.

iii. Write second and third term of an A.P. whose first term is 6 and common difference is –3.

iv. Two coins are tossed simultaneously. Write the sample space 'S'.

Q.1. (B) Solve the following subquestions: **[4]**

i. For simultaneous equations in variable x and y, if $D_x = 25$, $D_y = 40$, $D = 5$, then what is the value of x?

ii. Find the first term and common difference for the following A.P:

127, 135, 143, 151, ……

iii. A die is rolled then write sample space 'S' and number of sample point n(S).

iv. If $\sum fidi = 108$ and $\sum fi = 100$, then find $\bar{d} = ?$

Q.1. B. Solve the following subquestions: **[4]**

i. Find second and third term of an A.P. whose first term is – 2 and common difference is – 2.

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

iii. Find the values of a and b from the quadratic equation $2x^2 - 5x + 7 = 0$.

iv. If $15x + 17y = 21$ and $17x + 15y = 11$, then find the value of $x + y$.

Q.2. (A) Complete and following activities and rewrite it (any *two*) : **[4]**

i. Complete the following activity to solve the quadratic equation $x^2 + 8x - 48 = 0$ by completing square method.

Activity:

$\therefore \quad x^2 + 8x - 48 = 0$

$\therefore \quad x^2 + 8x + 16 - \square - 48 = 0$

$\therefore \quad (x+4)^2 - \square = 0$

$\therefore \quad (x+4)^2 = 64$

$\therefore \quad x + 4 = \square$ or $x + 4 = -8$

$\therefore \quad x = 4$ or $x = \square$

ii. Courier service agent charged total ₹590 to courier a parcel from Nashik to Nagpur. In the tax invoice taxable value is ₹500 on which CGST is ₹45 and SGST is ₹45. Complete the following activity to find the rate of GST charged for this service:

Activity:

Total GST = CGST + SGST

$= \square + 45$

$= ₹\square$

Rate of GST $= \frac{90}{500} \times \square$

$\therefore$ Rate of GST charged by agent is $\square$ %

iii. The monthly expenditure of a family on different items is shown in the following table. Complete the following activity to calculate the related central angles.

Activity:

Different items	Percentage of expenditure	Measure of central angle
Food	40	$\frac{40}{100} \times 360° = \square°$
Clothing	20	$\frac{20}{100} \times 360° = \square°$
Education	30	$\frac{30}{100} \times 360° = \square°$
Other expenditure	10	$\frac{10}{100} \times 360° = \square°$
Total	100	360°

Q.2. (A) Complete and write any *two* activities from the following: [4]

i. Complete the following table to draw the graph of $x + 2y = 4$.

Activity:

x	-2	☐
y	☐	1
(x, y)	☐	☐

ii. Complete the following activity to form a quadratic equation.

Activity:

I am a quadratic equation.

↓

My standard form is ☐.

↓

My roots are 5 and 12.

↓

Sum of my roots ☐.

↓

Product of my roots ☐.

↓

My quadratic equation is ☐.

iii. Pushpmala has invested ₹ 24,000 and purchased share of FV ₹ 20 at a premium of ₹ 4. Complete the following activity to find the number of shares she purchased.

Activity:

FV = ₹ 20

Premium = ₹ 4

MV = FV + ☐

= 20 + ☐

= ₹ 24

$$\text{Number of shares} = \frac{\text{Total investment}}{\text{MV}}$$

$$= \frac{24,000}{\square}$$

= ☐ shares.

Q.2. (A) Complete the following activities and rewrite it (any *two*): **[4]**

i. If (0, 2) is the solution of $2x + 3y = k$, then to find the value of k, complete the following activity:

Activity:

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

Put $x =$ ☐ and $y =$ ☐ in the given equation;

$\therefore \quad 2 \times$ ☐ $+ 3 \times 2 = k$

$\therefore \quad 0 + 6 = k$

$\therefore \quad k =$ ☐

ii. If 2 and 5 are the roots of the quadratic equation, then complete the following activity to form quadratic equation:

Activity:

Let $\alpha = 2$ and $\beta = 5$ are the roots of the quadratic equation.

Then quadratic equation is:

$x^2 - (\alpha + \beta)x + \alpha\beta = 0$

$\therefore \quad x^2 - (2 +$ ☐ $)\,x +$ ☐ $\times 5 = 0$

$\therefore \quad x^2 -$ ☐ $x +$ ☐ $= 0$

iii. Two coins are tossed simultaneously. Complete the following activity to write the sample space and the given events A and B in the set form:

Event A: To get at least one head.

Event B: To get no head.

Activity:

Two coins are tossed simultaneously.

$\therefore$ Sample space is

S = {☐, HT, TH, ☐}

Event A: To get at least one head.

$\therefore \quad$ A = {☐, HT, TH}

Event B: To get no head.

$\therefore \quad$ B = {☐}

Q.2. (A) Complete the following activity and rewrite (any *two*): **[4]**

i. Complete the following table to draw the graph of the equation $x + y = 3$:

x	3	☐	☐
y	☐	5	3
(x, y)	(3, 0)	☐	(0, 3)

ii. Complete the following activity to find the value of discriminant of the equation $x^2 + 10x - 7 = 0$.

Solution:

Comparing $x^2 + 10x - 7 = 0$ with $ax^2 + bx + c = 0$

$a = 1, b = 10, c =$ ☐

$\therefore \quad b^2 - 4ac =$ ☐ $- 4 \times 1 \times (-7)$

$= 100 +$ ☐

$\therefore \quad =$ ☐

iii. Complete the following table using given information:

Sr. No.	FV	Share is at	MV
1.	₹ 10	Premium of ₹ 7	☐
2.	₹ 25	☐	₹ 16
3.	₹ 300	☐	₹ 315
4.	☐	at par	₹ 5

Q.2. (A) Complete any *two* given activities and rewrite it: **[4]**

i. Complete the following activity; find the value of x:

$5x + 3y = 9$ …(I)

$2x - 3y = 12$ …(II)

Add equations (I) and (II)

$5x + 3y = 9$

$+ 2x - 3y = 12$

$7x =$ ☐

$x =$ ☐/☐

$x =$ ☐

ii. Complete the following activity to determine the nature of the roots of the quadratic equation $x^2 + 2x - 9 = 0$:

Solution:

Compare $x^2 + 2x - 9 = 0$ with $ax^2 + bx + c = 0$

$a = 1, b = 2, c =$ ☐

$\therefore \quad b^2 - 4ac = (2)^2 - 4 \times$ ☐ $\times$ ☐

$\Delta = 4 +$ ☐ $= 40$

$\therefore \quad b^2 - 4ac > 0$

$\therefore$ The roots of the equation are real and unequal.

iii. Complete the following table using given information:

Sr. No.	FV	Share is at	MV
1.	₹ 100	Par	☐
2.	☐	Premium ₹ 500	₹ 575
3.	₹ 10	☐	₹ 5
4.	₹ 200	Discount ₹ 50	☐

Q.2. (A) Complete and write any *two* activities from the following: **[4]**

i. Complete the following activity to find the 27th term of the following A.P.,
9, 4, –1, –6, –11, … .

Activity:

Here, a = 9, d = ☐ , n = 27

t_n = ☐ + (n – 1)d …[Formula]

∴ $t_{27} = 9 + (\square - 1)(-5)$

∴ t_{27} = ☐

ii. One die is rolled. Complete the following activity, to find the probability that the number on the upper face is prime.

Activity:

S is the sample space.

S = {☐}

∴ n(S) = 6

Even A: Getting a prime number on the upper face.

A = {☐}

∴ n(A) = 3

$P(A) = \frac{n(A)}{\square}$ …[Formula]

∴ P(A) = ☐

iii. Complete the following activity to find the value of x.

Activity;

$3x - y = 2$

$2x + y = 8$

☐ x = ☐

∴ $x = \frac{\square}{5}$

∴ x = ☐

Q.2. (A) Complete the following activities and rewrite it (any *two*): **[4]**

i. Complete the activity to find the value of the determinant.

Activity:

$$\begin{vmatrix} 2\sqrt{3} & 9 \\ 2 & 3\sqrt{3} \end{vmatrix} = 2\sqrt{3} \times \square - 9 \times \square$$

= ☐ –18

= ☐

ii. Complete the following activity to find the 19^{th} term of an A.P., 7, 13, 19, 25, ... :

Activity:

Given A.P. : 7, 13, 19, 25, ...

Here first term a = 7; t_{19} = ?

$t_n = a + (\square)\, d$ ..... (formula)

$\therefore \quad t_{19} = 7 + (19 - 1)\ \square$

$\therefore \quad t_{19} = 7 + \square$

$\therefore \quad t_{19} = \square$

iii. If one die is rolled, then to find the probability of an event to get prime number on uppe complete the following activity.

Activity:

One die is rolled.

'S' is sample space.

$S = \{\square\}$

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

Event A: Prime number on the upper face.

$A = \{\square\}$

$\therefore \quad n(A) = 3$

$\therefore \quad P(A) = \dfrac{\square}{n(S)}$ ..... (formula)

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

Q.2. (A) Complete the following activities and rewrite it (any two): **[4]**

i. Activity:

$$\begin{vmatrix} 3 & 2 \\ 4 & 5 \end{vmatrix} = 3 \times \square - \square \times 4$$

$$= \square - 8$$

$$= \square$$

ii. One of the roots of quadratic equation $5m^2 + 2m + k = 0$ is $-\frac{7}{5}$.

Complete the following activity to find the value of k.

Activity:

$-\frac{7}{5}$ is a root of quadratic equation

$5m^2 + 2m + k = 0$

Put m = ☐ in the equation

$\therefore \quad 5 \times \left(-\frac{7}{5}\right)^2 + 2 \times$ ☐ $+ k = 0$

$\therefore$ ☐ $+ \left(-\frac{14}{5}\right) + k = 0$

$\therefore \quad k =$ ☐

iii. Complete the activity to prepare a table showing the co-ordinates which are necessary to draw a frequency polygon:

Class	18 – 19	19 – 20	20 – 21	☐
Class Mark	18.5	19.5	☐	21.5
Frequency	4	☐	15	19
Co-ordinates of point	☐	(19.5, 13)	(20.5, 15)	(21.5, 19)

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Q.2. A. Complete and write any *two* activities from the following: **[4]**

i. Complete the following table to draw the graph of $2x - 6y = 3$:

x	–5	☐
y	☐	0
(x, y)	☐	☐

ii. First term and common difference of an A.P. are 6 and 3 respectively. Find S_{27}.

Solution:

First term = a = 6, common difference = $d = 3$, $S_{27} = ?$

$S_n = \frac{n}{2}[$ ☐ $+ (n-1)d]$ – formula

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

$= \frac{27}{2} \times$ ☐

$= 27 \times 45$

$\therefore \quad S_{27} =$ ☐

iii. A card is drawn from a well shuffled pack of 52 playing cards. Find the probability of the event, the card drawn is a red card.

Solution:

Suppose 'S' is sample space.

$\therefore \quad n(S) = 52$

Event A: Card drawn is a red card.

$\therefore$ Total red cards = ☐ hearts + 13 diamonds

$\therefore \quad n(A) =$ ☐

$\therefore \quad p(A) = \frac{\square}{n(S)}$ – formula

$\therefore \quad p(A) = \frac{26}{52}$

$\therefore \quad p(A) =$ ☐

(B) Solve the following subquestions (any *four*): **[8]**

i. Find the values of $(x + y)$ and $(x - y)$ of the following given simultaneous equations:
$101x + 99y = 501$
$99x + 101y = 499$

ii. Solve the following quadratic equation by factorisation method:
$x^2 - 15x + 54 = 0$

iii. Which term of the following A.P is 560?
2, 11, 20, 29,.....

iv. Market value of a share is ₹200. If the brokerage rate is 0.3%, then find the purchase value of the share.

v. If $\sum fidi = 10{,}000$, $\sum fi = 100$ and A = 2000, then find mean $(\bar{x})$.

(B) Solve any *four* subquestions from the following:

i. Solve the following simultaneous equations:
$x + y = 3$; $3x - 2y = 4$

ii. Solve the following quadratic equation by factorisation method:
$m^2 + 14m + 13 = 0$

iii. Find the 19th term of the following A.P.:
7, 13, 19, 25, …

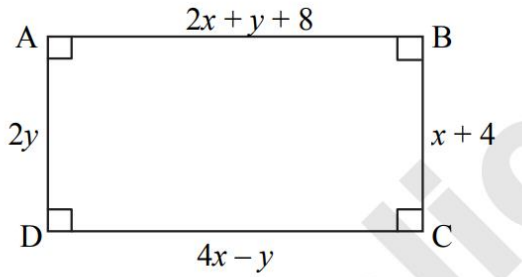
iv. A share is sold for the market value of ₹ 2,000. Brokerage is paid at the rate of 0.5%. What is the amount received after the sale?

v. The following table shows the number of students and the time they utilized daily for their studies. Find the mean time spent by the students for their studies.

Class Time (In hours)	Class Marks (x_i)	No. of Students (f_i)	$f_i x_i$
0 – 2	1	8	08
2 – 4	3	14	42
4 – 6	5	18	90
6 – 8	7	10	70
8 – 10	9	10	90

(B) Solve the following subquestions (any *four*): **[8]**

i. □ABCD is a rectangle. Write two simultaneous equations using information given below in the diagram, in the form of $ax + by = c$:



ii. Solve the following quadratic equation using factorisation method:
$x^2 + x - 20 = 0$

iii. Find the 19^{th} term of the following A.P.:
7, 13, 19, 25, …….

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

v. The following table shows classification of number of workers and number of hours they work in software company. Prepare less than upper limit type cumulative frequency distribution table:

Number of hours daily	Number of workers
8 – 10	150
10 – 12	500
12 – 14	300
14 – 16	50

(B) Solve the following subquestions (any *four*): **[8]**

i. Solve the following simultaneous equations:
$x + y = 6; x - y = 4$

ii. Solve the following quadratic equation by factorisation method:
$x^2 + 15x + 54 = 0$

iii. The first term a = 8 and common difference d = 5 are given. Write an A.P.

iv. Mr. Rohit is a retailer. He paid GST of ₹ 6,500 at the time of purchase. He collected GST of ₹8,000 at the time of sale.
(a) Find his input tax and output tax.
(b) What is his input tax credit?
(c) Find his payable GST.
(d) Hence find the payable CGST and payable SGST.

v. Find the mean from the given values:
$\sum x_i f_i = 1265; N = 50$

(B) Solve the following subquestions (any *four*): **[8]**

i. Solve the following simultaneous equations:
$x + y = 4$; $2x - y = 2$

ii. Write the following equation in the form $ax^2 + bx + c = 0$, then write the values of a, b, c:
$2y = 10 - y^2$.

iii. Write an A.P. whose first term is a = 10 and common difference d = 5.

iv. Courier service agent charged total ₹ 590 to courier a parcel from Nashik to Nagpur. In the tax invoice taxable value is ₹ 500 on which CGST is ₹ 45 and SGST is ₹ 45. Find the rate of GST charged for this service.

v. Observe the following table and find Mean:
Assumed mean A = 300

Class	Class mark x_i	$d_i = x_i - A$ $d_i = x_i - 300$	Frequency f_i	Frequency × Deviation $f_i d_i$
200 – 240	220	–80	5	– 400
240 – 280	260	–40	10	– 400
280 – 320	300→ A	0	15	0
320 – 360	340	40	12	480
360 – 400	380	80	8	640
Total			$\Sigma f_i = 50$	$\Sigma f_i d_i = 320$

(B) Solve any *four* subquestions from the following: **[8]**

i. For solving the following simultaneous equations, find the values of $(x + y)$ and $(x - y)$.
$15x + 17y = 21$, $17x + 15y = 11$.

ii. Find the value of the discriminant of the quadratic equation $2y^2 - y + 2 = 0$.

iii. Find the sum of the first 21 even natural numbers.

iv. Two coins are tossed simultaneously. Find the probability of the event of getting no head.

v. Find D_x and D_y for the following simultaneous equations.
$x + 2y = -1$, $2x - 3y = 12$

(B) Solve the following subquestions (any *four*): **[8]**

i. To solve the following simultaneous equations by Cramer's rule, find the value of D_x and D_y.
$3x + 5y = 26$
$x + 5y = 22$

ii. 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?

iii. Find the sum of first 'n' even natural numbers.

iv. Solve the following quadratic equations by factorisation method:
$x^2 + x - 20 = 0$

v. Find the values of $(x + y)$ and $(x - y)$ of the following simultaneous equations:
$49x - 57y = 172$
$57x - 49y = 252$

Q.2. (B) Solve the following sub-questions (any four): **[8]**

i. Sum of two numbers is 7 and their difference is 5. Find the numbers.

ii. Solve the quadratic equation by factorisation method:
$x^2 + x - 20 = 0$

iii. Find the 19th term of the following A.P.:
7, 13, 19, 25, …….. .

iv. For the following experiments, write sample space 'S' and number of sample points n(S):
Two digit numbers are formed using digits 2, 3 and 5 without repeating a digit.

v. The following table shows causes of noise pollution. Find the measure of central angles for each, to draw a pie diagram:

Construction	Traffic	Aircraft take offs	Industry
10%	50%	15%	25%

Q.2. B. Solve any *four* subquestions from the following: **[8]**

i. Find the value of the determinant:

$$\begin{bmatrix} \frac{7}{3} & \frac{5}{3} \\ \frac{3}{2} & \frac{1}{2} \end{bmatrix}$$

ii. Solve the quadratic equation by factorisation method:
$x^2 - 15x + 54 = 0$

iii. Decide whether the following sequence is an A.P. if so, find the 20^{th} term of the progression:
$-12, -5, 2, 9, 16, 23, 30, \ldots\ldots\ldots\ldots$

iv. A two digit number is formed with digits 2, 3, 5, 7, 9 without repetition. What is the probability that the number formed is an odd number?

v. If L = 10, $f_1 = 70, f_0 = 58, f_2 = 42, h = 2$, then find the mode by using formula.

Q.3. (A) Complete the following activities and rewrite it (any *one*): **[3]**

i. In an A.P sum of three consecutive terms is 27 and their product is 504. Complete the following activity to find the terms.

Activity:

Let three consecutive terms be a – d, a, a + d.

∴ a – d + a + a + d = ☐

∴ a = ☐

Similarly:

(a – d) × a × (a + d) = ☐

∴ $[(9)^2 - d^2] \times 9 = 504$

∴ $(81 - d^2) \times 9 = 504$

∴ $d^2 = 81 -$ ☐

∴ $d = \pm 5$

Thus by putting a = 9 and d = 5 we get three consecutive terms = ☐

Or by putting a = 9 and d = –5 we get three consecutive terms = ☐

ii. A card is drawn from a well shuffled pack of 52 playing cards.
Complete the following activity to find the probability of the following events:
a. A red card
b. A face card.

Activity:

Let 'S' is the sample space.

∴ n (S) = ☐

Event A: Card drawn is a red card.

Total red cards = ☐

∴ n(A) = ☐

∴ $P(A) = \frac{n(A)}{n(S)}$ ..... [Formula]

∴ $P(A) = \frac{26}{52}$

Event B: Card drawn is a face card.

Total face cards = 12

∴ n (B) = ☐

∴ $P(B) = \frac{n(B)}{n(S)}$ ..... [Formula]

∴ $P(B) = \frac{12}{52}$

∴ P(B) = ☐

Q.3. (A) Complete and write any *one* activity from the following: **[3]**

i. Shri Maniklal has purchased 300 shares of F.V. ₹ 100, for M.V. ₹ 120. Company has paid dividend at 7%. Complete the following activity to find the rate of return on his investment.

Activity:

F.V. = ₹ 100

Number of shares = 300

Market value = ₹ 120

a. Sum invested = M.V. × No. of shares

∴ = ☐ × ☐

= ₹ 36,000

b. Dividend per share = F.V. × rate of dividend

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

= ₹ 7

∴ Total dividend received = 300 × 7

= ₹ ☐

c. Rate of return = $\frac{\text{Dividend income}}{\text{Sum invested}} \times 100$

$= \frac{2,100}{36,000} \times 100$

= ☐ %.

ii. A two digit number is to be formed from the digits 2, 3, 5 without repetition of the digits. Complete the following activity to find the probability that the number so formed is an odd number.

Activity:

Let S be the sample space.

∴ S = {23, 25, 32, ☐, 52, 53}

∴ n(S) = ☐

Event A: The number so formed is an odd number.

∴ A = {23, 25, ☐, 53}

∴ n(A) = 4

∴ $P(A) = \frac{\square}{n(S)}$ …[Formula]

∴ $P(A) = \frac{\square}{6}$

∴ $P(A) = \frac{\square}{3}$

Q.3. (A) Complete the following activity and rewrite it (any *one*): **[3]**

i. The following frequency distribution table shows the classification of the number of vehicles and the volume of petrol filled in them. To find the mode of the volume of petrol filled, complete the following activity:

Class (Petrol filled in Liters)	Frequency (Number of Vehicles)
0.5 – 3.5	33
3.5 – 6.5	40
6.5 – 9.5	27
9.5 – 12.5	18
12.5 – 15.5	12

Activity:

From the given table,

Modal class = ☐

$\therefore$ Mode = ☐ $+ \left[\frac{f_1 - f_0}{2f_1 - f_0 - \square}\right] \times h$

$\therefore$ Mode = $3.5 + \left[\frac{40 - 33}{2(40) - 33 - 27}\right] \times$ ☐

$\therefore$ Mode = $3.5 + \left[\frac{7}{80 - 60}\right] \times 3$

$\therefore$ Mode = ☐

$\therefore$ The mode of the volume of petrol filled is ☐.

ii. The total value (with GST) of remote controlled toy car is ₹ 2360. Rate of GST is 18% on toys. Complete the following activity to find the taxable value for the toy car:

Activity:

Total value for toy car with GST = ₹ 2360

Rate of GST = 18%

Let taxable value for toy car be ₹ x

$\therefore$ GST = $\frac{18}{100} \times x$

$\therefore$ Total value for toy car = $\begin{pmatrix}\text{taxable value}\\ \text{for toy car}\end{pmatrix}$ + ☐ ….. Formula

$\therefore$ 2360 = ☐ $+ \frac{\square}{100} \times x$

$\therefore$ 2360 = $\frac{\square}{100} \times x$

$\therefore$ $2360 \times 100 = 118x$

$\therefore$ $x = \frac{2360 \times 100}{\square}$

$\therefore$ Taxable value for toy car is ₹ ☐

Q.3. (A) Complete the following activity and rewrite (any *one*): **[3]**

i. Smita has invested ₹ 12,000 and purchased shares of FV ₹ 10 at a premium of ₹ 2. Find the number of shares she purchased. Complete the given activity to get the answer.

Solution:

FV = ₹ 10, Premium = ₹ 2

∴ MV = FV + ☐ = 10 + ☐ = ☐

∴ Number of shares = $\frac{\text{Total investment}}{\text{MV}} = \frac{12{,}000}{\square}$

= ☐ shares

Ans. Smita has purchased ☐ shares.

ii. If one die is rolled once, then find the probability of each of the following events:

(a) Number on the upper face is prime.

(b) Number on the upper face is even.

Solution:

'S'is the sample space

S = {1, 2, 3, 4, 5, 6} ∴ n(S) = ☐

(a) Event A : Prime number on the upper face

A = {2, 3, 5} ∴ n(A) = ☐

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

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

Q.3. (A) Complete any *one* activity and rewrite it: **[3]**

i. Form a 'Road Safety Committee' of two, from 2 boys (B_1, B_2) and 2 girls (G_1, G_2). Complete the following activity to write the sample space:

a. Committee of 2 boys = {☐}

b. Committee of 2 girls = {☐}

c. Committee of one boy and one girl = {B_1G_1, B_1G_2, ☐, ☐}

d. ∴ Sample space (S) = {(B_1B_2), (B_1G_1), ☐, ☐, (B_2G_2), (G_1G_2)}

ii. Fill in the boxes with the help of 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 ₹)	Taxable amount	CGST		SGST	
9963	Coffee	1	20	20.00	2.5 %	₹ 0.50	2.5 %	
9963	Masala Tea	1	10	10.00		₹ 0.25	2.5 %	
9963	Masala Dosa	2	60		2.5%		2.5%	₹ 3.00
			Total	150.00				₹ 3.75
						Grand Total	= ₹ 157.50	

Q.3. (A) Complete and write any *one* activity from the following: **[3]**

i. From three men and two women, environment committee of two persons is to be formed. To find the probabilities of the given events, complete the following activities.

Event A: There must be at least one woman member.

Event B: Committee of one man and one woman to be formed.

Activity:

Let M_1, M_2, M_3 be three men and W_1, W_2 be two women. Out of these men and women environment committee of the 2 persons is to be formed.

$S = \{M_1M_2, M_1M_3, M_2M_3, M_1W_1, M_1W_2, M_2W_1, M_2W_2, M_3W_1, M_3W_2, \square\}$

$\therefore$ $n(S) = 10$

Event A: There must be at least one woman member.

$A = \{M_1W_1, M_1W_2, \square, M_2W_2, M_3W_1, M_3W_2, W_1W_2\}$

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

$P(A) = \dfrac{n(A)}{n(S)}$ …[Formula]

$\therefore$ $P(A) = \dfrac{\square}{10}$

Event B: Committee of one man and one woman to be formed.

$B = \{M_1W_1, M_1W_2, M_2W_1, \square, M_3W_1, M_3W_2\}$

$\therefore$ $n(B) = 6$

$P(B) = \dfrac{n(B)}{n(S)}$ …[Formula]

$\therefore \quad P(B) = \frac{6}{10}$

$\therefore \quad P(B) = \frac{3}{\square}$

ii. Complete the following activity to find the roots of the quadratic equation $25x^2 + 30x + 9 = 0$ by formula method.

Activity:

$25x^2 + 30x + 9 = 0$

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

$a = 25, b = \square, c = 9$

$b^2 - 4ac = (30)^2 - 4 \times 25 \times 9$

$= 900 - 900$

$= \square$

$x = \frac{\square \pm \sqrt{b^2 - 4ac}}{2a}$

$= \frac{-\square \pm \sqrt{0}}{2 \times 25}$

$\therefore \quad x = \frac{-30 + 0}{50}$ or $\therefore \quad x = \frac{\square - 0}{50}$

$\therefore \quad x = -\frac{30}{50}$ or $\therefore \quad x = -\frac{30}{50}$

$\therefore \quad x = -\frac{\square}{5}$ or $\therefore \quad x = -\frac{3}{5}$

Q.3. (A) Complete the following activity and rewrite it (any *one*): **[3]**

i. One of the roots of equation $kx^2 - 10x + 3 = 0$ is 3. Complete the following activity to find the value of k.

Activity:

One of the roots of equation

$kx^2 - 10x + 3 = 0$ is 3

Putting $x = \square$ in the above equation

$\therefore \quad k(\square)^2 - 10 \times \square + 3 = 0$

$\therefore \quad \square - 30 + 3 = 0$

$\therefore \quad 9k = \square$

$\therefore \quad k = \square$

ii. A card is drawn at random from a pack of well shuffled 52 playing cards. Complete the following activity to find the probability that the card drawn is –

Event A: The card drawn is an ace.

Event B: The card drawn is a spade.

Activity:

'S' is the sample space.

$\therefore$ $n(S) = 52$

Event A: The card drawn is an ace.

$\therefore$ $n(A) =$ ☐

$\therefore$ $P(A) =$ ☐ ……..(formula)

$\therefore$ $P(A) = \frac{\square}{52}$

$\therefore$ $P(A) = \frac{\square}{13}$

Event B: The card drawn is a spade.

$\therefore$ $n(B) =$ ☐

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

$\therefore$ $P(B) = \frac{\square}{4}$

Q.3. (A) Complete the following activity and rewrite it (any one): **[3]**

i. In an A.P. the first term is –5 and last term is 45. If sum of 'n' terms in the A.P. is 120, then complete the activity to find n.

Activity:

$t_1 = -5$, $t_n =$ ☐ , $S_n =$ ☐

$S_n = \frac{n}{2}[t_1 +$ ☐ $]$

☐ $= \frac{n}{2}[-5 + 45]$

$240 = n \times$ ☐

$n =$ ☐

ii. A card is drawn from a well shuffled pack of 52 playing cards.
Complete the activity to find the probability of the event that the card drawn is a red card.

Activity:

'S' is the sample space.

$n(S) = 52$

Event A: Card drawn is a red card.

Total number of red cards = ☐ hearts + ☐ diamonds

$\therefore$ $n(A) =$ ☐

$$p(A) = \frac{\square}{n(S)}$$

$$\therefore \quad p(A) = \frac{\square}{52}$$

$$\therefore \quad p(A) = \square$$

March 2020

Q.3. A. Complete and write any *one* activity from the following: **[3]**

i.

Age group (in years)	**No. of Persons**	**Measure of central angle**
20 – 25	80	$\frac{\square}{200} \times 360 = \square$
25 – 30	60	$\frac{60}{200} \times 360 = \square$
30 – 35	35	$\frac{35}{200} \times \square = 63^\circ$
35 – 40	25	$\frac{25}{200} \times 360 = \square$
Total	200	$\square$

ii. Shri Shantilal has purchased 150 shares of FV ₹ 100, for MV of ₹ 120, Company has paid dividend at 7%, then to find the rate of return on his investment, complete the following activity:

Solution: FV = ₹ 100; Number of shares = 150

Market value = ₹ 120

1. Sum investment = MV × No. of Shares

$$= \square \times \square$$

$\therefore$ Sum investment = ₹ 18,000

2. Dividend per share = FV × Rate of dividend

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

$$= ₹\ 7$$

$\therefore$ Total dividend received = 150 × 7

$$= \square$$

3. $$\text{Rate of return} = \frac{\text{Dividend income}}{\text{Sum invested}} \times 100$$

$$= \frac{1050}{18000} \times 100$$

$$= \square$$

(B) Solve the following subquestions (any *two*): **[6]**

i. In the following table the yearly investment made by 210 families is given. From this information draw the histogram.

Investment (Thousand Rupees)	Number of families
10 – 20	30
20 – 30	50
30 – 40	60
40 – 50	55
50 – 60	15

ii. Shri Shivajirao has purchased 150 shares of F.V. ₹100, for M.V. of ₹120. Company has paid 7% dividend. Find the rate of return on his investment.

iii. Product of Shraddha's age 2 years ago and 3 years hence is 84. Find her present age.

iv. Solve the following simultaneous equations graphically:
$x + y = 6, x - y = 4$

(B) Solve any *two* subquestions from the following: **[6]**

i. Solve the following simultaneous equations by Cramer's rule:
$4x + 3y = 18; 3x - 2y = 5$

ii. Solve the following quadratic equation by using formula method:
$x^2 - 2x - 3 = 0$

iii. A committee of two members is to be formed from three boys and two girls. Find the probability of the following events:
Event A: At least one girl must be a member of the committee.
Event B: Committee must be of one boy and one girl.

iv. In a general store the prices of different articles and its demand is shown in the following frequency distribution table. Find the Median of the prices.

Price in Rupees	No. of Articles
Less than 20	140
20 – 40	100
40 – 60	80
60 – 80	60
80 – 100	20

(B) Solve the following subquestions (any *two*): **[6]**

i. Solve the following quadratic equation by formula method:
$3m^2 - m - 10 = 0$

ii. Solve the following simultaneous equations using Cramer's rule:
$3x - 4y = 10, 4x + 3y = 5$

iii. 50 shares of face value ₹ 10 were purchased for market value of ₹ 25. Company declared 30% dividend on the shares, then find:
   a. Sum invested
   b. Dividend received
   c. Rate of return.

iv. One coin and a die are thrown simultaneously. Find the probability of the following events:
Event A: To get a head and a prime number.
Event B: To get a tail and an odd number.

(B) Solve the following subquestions (any *two*): **[6]**

i. Two numbers differ by 3. The sum of the twice the smaller number and thrice the greater number is 19. Find the numbers.

ii. Solve the given quadratic equation by using formula method: $5x^2 + 13x + 8 = 0$

iii. 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) a red balloon

(b) a blue balloon

(c) a green balloon.

iv. The following table shows the number of students of class X and the time they utilized daily for their studies. Find the mean time spent by 50 students for their studies by direct method:

Time (hrs.)	No. of students
0 – 2	7
2 – 4	18
4 – 6	12
6 – 8	10
8 – 10	3

(B) Solve the following subquestions (any *two*): **[6]**

i. Solve the following simultaneous equations using Cramer's rule
$4m + 6n = 54$; $3m + 2n = 28$

ii. Solve the following quadratic equation by formula method:
$x^2 + 10x + 2 = 0$

iii. A two digit number if formed with digits 2, 3, 5, 7, 9 without repetition. What is the probability of the following events?
Event A: The number formed is an odd number.
Event B: The number formed is a multiple of 5.

iv. The frequency distribution table shows the number of mango trees in a grove and their yield of mangoes. Find the median of data:

No. of Mangoes	No. of Trees
50 – 100	33
100 – 150	30
150 – 200	90
200 – 250	80
250 – 300	17

(B) Attempt any *two* subquestions from the following: **[6]**

i. Solve the given equation by factorisation: $5m^2 = 22m + 15$.

ii. Solve the following equations:
$3x - 2y = \frac{5}{2}$, $\frac{1}{3}x + 3y = -\frac{4}{3}$.

iii. Length and breadth of a rectangular garden are 77 metres and 50 metres. There is a circular lake in the garden having diameter 14 m. Due to wind, a towel from a terrace on a nearby building fell into the garden. Find the probability of the event that it fell in the lake.

iv. A two digit number and the number with digits interchanged add up to 143. In the given number the digit in units place is 3 more than the digit in the tens place. Find the original number.

(B) Solve the following subquestions (any *two*): **[6]**

i. Solve the simultaneous equations by using graphical method:
$x + 3y = 7$
$2x + y = -1$

ii. There is an auditorium with 27 rows of seats. There are 20 seats in the first row, 22 seats in the second row, 24 seats in the third row and so on. Find how many total seats are there in the auditorium?

iii. Sum of the present ages of Manish and Savita is 31 years. Manish's age 3 years ago was 4 times the age of Savita at that time. Find their present ages.

iv. Solve the following quadratic equation using formula:
$x^2 + 10x + 2 = 0$

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Q.3. (B) Solve the following subquestions (any two): **[6]**

i. Solve the following simultaneous equations graphically:
$x + y = 5; x - y = 1.$

ii. Solve quadratic equation using formula method:
$5m^2 + 13m + 8 = 0.$

iii. A retailer sold 2 tins of lustre paint and taxable value of each tin is ₹ 2,800. If the rate of GST is 28%, then find the amount of CGST and SGST charged in the tax invoice.

iv. Time allotted for the preparation of an examination by some students is shown in the table. Draw a histogram to show this information:

Time (minutes)	No. of Students
60-80	14
80-100	20
100-120	24
120-140	22

March 2020 **www.saiphy.com**

Q.3. B. Attempt any *two* subquestions from the following: **[6]**

i. 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:
1. a red balloon.
2. a blue balloon.

ii. The denominator of a fraction is 4 more than twice its numerator. Denominator becomes 12 times the numerator, if both the numerator and the denominator are reduced by 6, find the fraction.

iii. A milk centre sold milk to 50 customers. The table below gives the number of customers and the milk they purchased. Find the mean of the milk sold by direct method:

Milk Sold (litre)	No. of Customers
1–2	17
2–3	13
3–4	10
4–5	7
5–6	3

iv. In an A.P. sum of three consecutive terms is 27 and their products is 504. Find the terms. (Assume that three consecutive terms in an A.P. are a – d, a, a + d.)

Q.4. Solve the following subquestions (any *two*): **[8]**

i. In an agriculture field the ratio of salary of skilled and unskilled workers is 5 : 4. Total salary of one day of both of them is ₹900. Find daily wages of skilled and unskilled workers.

ii. Two dice are thrown. Find the probability of the following events:
   a. Event A: The sum of the numbers on their upper faces is at least 9.
   b. Event B: The sum of the numbers on their upper faces is divisible by 5.
   c. Event C: The number on the upper face of the first die is greater than the number on the upper face of the second die.

iii. In the following frequency distribution table ages of 300 patients and number of patients in a hospital is given. Find the median age of the patients:

Age (In years)	Number of patients
10 – 20	60
20 – 30	42
30 – 40	55
40 – 50	70
50 – 60	53
60 – 70	20

Q.4. Solve any *two* subquestions from the following: **[8]**

i. Find the value of 'm' if the quadratic equation
$(m - 12)x^2 + 2(m - 12)x + 2 = 0$
has real and equal roots.

ii. A farmer borrows ₹ 1,000 and agrees to repay with a total interest of ₹ 140, in 12 instalments. Each instalment being less than the preceding instalment by ₹ 10. What should be the amount of his first and last instalment?

iii. The following table shows the marks of 180 students in Mathematics.

Marks	No. of Students
0 – 10	25
10 – 20	x
20 – 30	30
30 – 40	$2x$
40 – 50	65

Find the value of 'x' and draw histogram.

Q.4. Solve the following subquestions (any *two*): **[8]**

i. 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.

ii. The following table shows the classification of percentage of marks of students and the number of students. Draw frequency polygon from the table without drawing histogram:

Result (Percentage)	Number of Students
20 – 40	25
40 – 60	65
60 – 80	80
80 – 100	15

iii. In a 'Mahila Bachat Gat' Kavita invested from the first day of month ₹ 20 on first day, ₹ 40 on second day and ₹ 60 on third day. If she saves like this, then what would be her total saving in the month of February 2020?

Q.4. Solve the following subquestions (any *two*): **[8]**

i. The sum of two roots of a quadratic equation is 5 and sum of their cubes is 35, find the equation.

ii. If p times the p^{th} term of an A.P. is equal to q times q^{th} term, then show that $(p + q)^{th}$ term of that A.P. is zero ($p \neq q$).

iii. Draw a pie diagram to represent the world population given in the following table :

Country	Japan	England	India	China
Percentage of World Population	20	10	40	30

Q.4. Solve the following subquestions (any *two*): **[8]**

i. If the first term of an A.P. is p, second term is q and last term is r, then show that sum of all terms is $(q + r - 2p) \times \frac{(p+r)}{2(q-p)}$.

ii. Show the following data by a frequency polygon:

Electricity bill (₹)	Families
200 – 400	240
400 – 600	300
600 – 800	450
800 – 1000	350
1000 – 1200	160

iii. The sum of the squares of five consecutive natural numbers is 1455. Find the numbers.

Q.4. Attempt any *two* subquestions from the following: **[8]**

i. Solve the following simultaneous equations graphically:
$x + y = 4$, $3x - 2y = 7$.

ii. A train travels 240 km with uniform speed. If the speed of the train is increased by 12 km/h, it takes one hour less to cover the same distance. Find the initial speed of the train.

iii. If the sum of the first p terms of an A.P. is equal to the sum of first q terms, then show that the sum of its first (p + q) terms is zero ($p \neq q$).

Q.4. Solve the following subquestions (any *two*): **[8]**

i. If 460 is divided by a natural number, then quotient is 2 more than nine times the divisor and remainder is 5. Find the quotient and divisor.

ii. If the 9^{th} term of an A.P. is zero, then prove that the 29^{th} term is double the 19^{th} term.

iii. The perimeter of an isosceles triangle is 24 cm. The length of its congruent sides is 13 cm less than twice the length of its base. Find the lengths of all sides of the triangle.

Q.4. Solve the following subquestions (any two): **[8]**

i. If one root of the quadratic equation $ax^2 + bx + c = 0$ is half of the other root, show that, $b^2 = \frac{9ac}{2}$.

ii. Bhujangrao invested ₹ 2,50,590 in shares of F.V. ₹ 10 when M.V. is ₹ 250. Rate of brokerage is 0.2% and GST is 18%, then find:
   a. the number of shares purchased,
   b. the amount of brokerage paid, and
   c. GST paid for the trading.

iii. The following table shows frequency distribution of number of trees planted by students in the school:

No. of Trees Planted	No. of Students
0-10	30
10-20	70
20-30	100
30-40	70
40-50	40

Find the mode of trees planted.

Q.4. Attempt any *two* subquestions from the following: **[8]**

i. Represent the following data by histogram:

Price of Sugar (per kg in ₹)	Number of Weeks
18–20	4
20–22	8
22–24	22
24–26	12
26–28	6
28–30	8

ii. One person borrows ₹ 4,000 and agrees to repay with a total interest of ₹ 500 in 10 instalments. Each instalment being less than the preceding instalment by ₹ 10. What should be the first and the last instalments?

iii. The sum of the areas of two squares is 400 sq.m. If the difference between their perimeters is 16 m, find the sides of two squares.

Q.5. Solve the following subquestions (any *one*) : **[3]**

i. Three conditions are given below. Write the quadratic equation for each of them satisfy that condition:

a. If discriminant $\Delta = 0$

b. If discriminant $\Delta > 0$

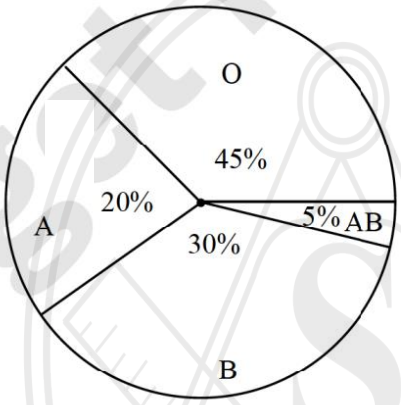
c. If discriminant $\Delta < 0$

ii. If first term of an A.P. is 'p', second term is 'q' and last term is 'r', then show that the sum of all terms is $\frac{(p+r)(q+r-2p)}{2(q-p)}$.

Q.5. Solve any *one* of the following subquestions: **[3]**

i. Draw the graphs representing the equation $2x = y + 2$ and $4x + 3y = 24$ on the same graph paper. Find the area of the triangle formed by these lines and the X-axis.

ii. The following pie-diagram shows percentage of persons according to blood group in a blood group checking camp. Answer the following questions:



a. Find the measure of central angle for each blood group.

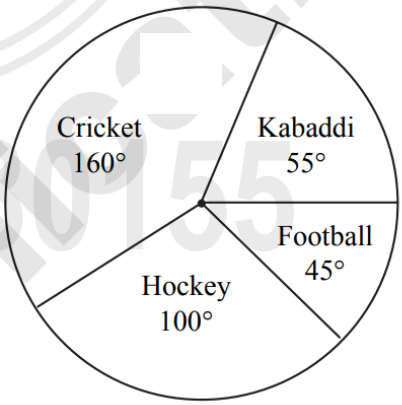
b. Find the total number of persons, if there are 600 persons of blood group B.

Q.5. Solve the following subquestions (any *one*): **[3]**

i. In the given figure, the pie diagram represents the amount spent on different sports by a school administration in a year. If the money spent on football is ₹ 9,000, answer the following questions:

a. What is the total amount spent on sports?

b. What is the amount spent on cricket?



ii. Draw the graph of the equation $x + y = 4$ and answer the following questions:

a. Which type of triangle is formed by the line with X and Y-axes based on its sides.

b. Find the area of that triangle.

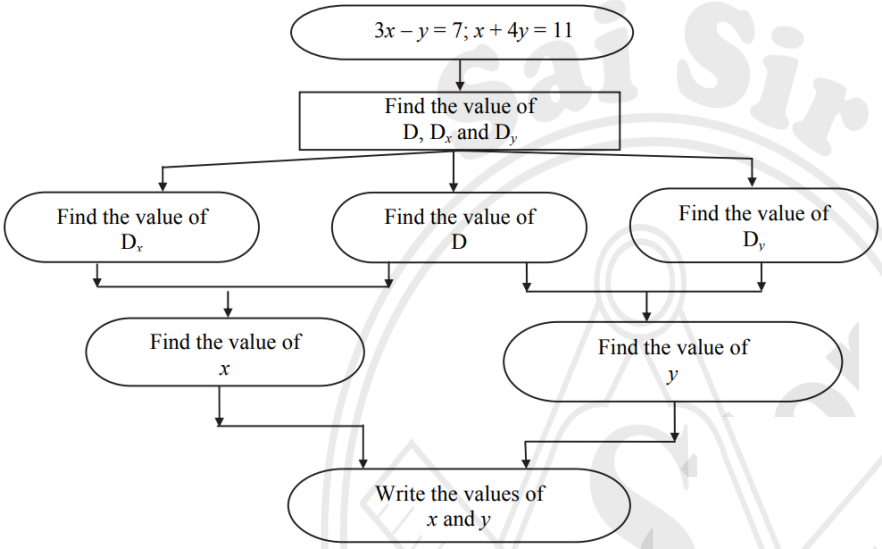
July 2023 www.saiphy.com

Q.5. Solve the following subquestions (any *one*): **[3]**

i. Represent the following data using histogram:

Daily Income (₹)	No. of Workers
130 – 135	4
135 – 140	7
140 – 145	14
145 – 150	16

ii. Observe the following flow chart and solve it:



March 2023 www.saiphy.com

Q.5. Solve the following subquestions (any *one*): **[3]**

i. Draw the graph of the equation $x + 2y = 4$. Find the area of the triangle formed by the line intersecting to X-axis and Y-axis.

ii. A survey was conducted for 180 people in a city. 70 ate Pizza, 60 ate burgers and 50 ate chips. Draw a pie diagram for the given information.

July 2022 www.saiphy.com

Q.5. Solve the following subquestions: (Any *one*) **[3]**

i. The measures of the angles of a quadrilateral are in A.P. The measure of largest angle is twice the smallest. Find the measures of all angles of the quadrilateral.
[Assume measures of angles as a°, (a + d)°, (a + 2d)°, (a + 3d)°,
(where a < a + d < a + 2d < a + 3d)]

ii. The product of two numbers is 352 and their mean is 19. Find the numbers.

March 2022 www.saiphy.com

Q.5. Solve the following subquestions (any *one*): **[3]**

i. A bag contains 8 red and some Blue balls. One ball is drawn at random from the bag. If ratio of probability of getting red ball and blue ball is 2 : 5, then find the number of blue balls.

ii. Measures of angles of a triangle are in A.P. the measure of smallest angle is five times of common difference. Find the measures of all angles of a triangle.
(Assume the measures of angles as a, a + d, a + 2d)

Q.5. Solve the following subquestions (any one): **[3]**

i. Six faces of a die are as shown below:

A	B	C	D	E	O

If the die is rolled once, find the probability of event 'M' that 'English vowel appears on upper face'.

ii. Construct any one linear equation in two variables. Obtain another equation by interchanging only coefficients of variables. Find the value of the variables.

Q.5. Attempt any *one* subquestion from the following: **[3]**

i. Convert the following equations into simultaneous equations and solve:

$$\sqrt{\frac{x}{y}} = 4, \frac{1}{x} + \frac{1}{y} = \frac{1}{xy}$$

ii. A dealer sells a toy for ₹ 24 and gains as much percent as the cost price of the toy. Find the cost price of the toy.