

- Note:**
- All questions are compulsory.
 - Use of a calculator is not allowed.
 - The numbers to the right of the questions indicate full marks.
 - In case of MCQs [Q. No. 1(A)], only the first attempt will be evaluated and will be given credit.
 - For every MCQ, the correct alternative (A), (B), (C) or (D) with subquestion number is to be written as an answer.

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

- To draw the graph of $4x + 5y = 19$, find y when $x = 1$:
(a) 4 (b) 3 (c) 2 (d) -3
- 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) $2x - x^2 = x^2 + 5$
- For the given A.P. $a = 3.5$, $d = 0$, then $t_n = \dots$
(a) 0 (b) 3.5 (c) 103.5 (d) 104.5
- 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. (B) Solve the following sub-questions. [4]

- Find the value of the following determinant:
$$\begin{vmatrix} 4 & 3 \\ 2 & 7 \end{vmatrix}$$
- Find the common difference of the following A.P.:
2, 4, 6, 8,
- On certain article if rate of CGST is 9%, then what is the rate of SGST?
- If one coin is tossed, write the sample space 'S'.

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

(1) Complete the following activity; find the value of x :

$$5x + 3y = 9 \dots\dots\dots (I)$$

$$2x - 3y = 12 \dots\dots\dots (II)$$

Add equations (I) and (II)

$$\begin{array}{r} 5x + 3y = 9 \\ + \quad 2x - 3y = 12 \\ \hline 7x = \boxed{} \end{array}$$

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

$$\therefore x = \boxed{}$$

(2) 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 $ax^2 + bx + c = 0$

$$a = 1, b = 2, c = \boxed{}$$

$$\therefore b^2 - 4ac = (2)^2 - 4 \times \boxed{} \times \boxed{}$$

$$\Delta = 4 + \boxed{} = 40$$

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

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

(3) Complete the following table using given information:

Sr. No.	FV	Share is at	MV
1.	₹100	Par	<input type="text"/>
2.	<input type="text"/>	Premium ₹500	₹575
3.	₹10	<input type="text"/>	₹5
4.	₹200	Discount ₹50	<input type="text"/>

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

(1) Solve the following simultaneous equations:

$$x + y = 4, 2x - y = 2$$

(2) Write the following equation in the form $ax^2 + bx + c = 0$, then write the values of a, b, c :

$$2y = 10 - y^2$$

(3) Write an A.P. whose first term is $a = 10$ and common difference $d = 5$.

(4) 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.

(5) 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 \times Deviation $f_i d_i$
200–240	220	-80	5	-400
240–280	260	-40	10	-400
280–320	300 \rightarrow A	0	15	0
320–360	340	40	12	480
360–400	380	80	8	640
Total			$\sum f_i = 50$	$\sum f_i d_i = 320$

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

(1) 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

= { , , , }

(d) \therefore Sample space (S) =

$\{(B_1, B_2), (B_1, G_1), \square, \square, (B_2, G_2), (G_1, G_2)\}$

(2) 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%	<input type="text"/>
9963	Masala Tea	1	10	10.00	<input type="text"/>	₹ 0.25	2.5%	<input type="text"/>
9963	Masala Dosa	2	60	<input type="text"/>	2.5%	<input type="text"/>	2.5%	₹ 3.00
			Total	150.00		<input type="text"/>		₹ 3.75
Grand Total							= ₹ 157.50	

Q.3. (B) Solve the following sub-questions. (Any two) [6]

(1) Solve the following simultaneous equations using Cramer's rule:

$$4m + 6n = 54; 3m + 2n = 28$$

(2) Solve the following quadratic equation by formula method:

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

(3) A two digit number is 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.

(4) 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

Q.4. Solve the following sub-questions. (Any two) [8]

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

- (3) The sum of the squares of five consecutive natural numbers is 1455. Find the numbers.

Q.5. Solve the following sub-questions. (Any one) [3]

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