SHAH CLASSES®

CULTIVATING SUCCESS SINCE 1998

Subject : Algebra **Total Marks : 40**

Class : X^th **Prelim Question Paper - 1** **Time : 2 Hr.**

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

1. A die is rolled. What is the probability that the number appearing on upper face is less than 3 ?

a) $\frac{1}{6}$ b) $\frac{1}{3}$

c) $\frac{1}{2}$ d) 0

2. GST system was introduced in our country from _____.

a) 31st March 2017 b) 1st April 2017

c) 1st January 2017 d) 1st July 2017

3. The formula to find mean from a grouped frequency table is $\bar{X} = A + \frac{\sum f_i u_i}{\sum f_i} \times hg$ In the formula u_i = _____

a) $\frac{x_i + A}{g}$ b) $(x_i - A)$

c) $\frac{x_i - A}{g}$ d) $\frac{A - x_i}{g}$

4. The persons of O - blood are 40%. The classification of persons based on blood groups is to be shown by a pie diagram. What should be the measure of angle for the persons of O - blood group?

a) 114^0 b) 140^0

c) 104^0 d) 144°

B) Solve the following questions. (4)

1. How many possibilities are there in the following event?

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

2. Find the value of the following determinant.

$$\begin{vmatrix} 5 & -2 \\ -3 & 1 \end{vmatrix}$$

3. Two roots of quadratic equations are given; frame the equation.

   i. 10 and -10

4. Is the following sequence A.P.? If it is A.P. find the common difference. 127, 132, 137, ...

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

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 = [{__, __, __, __}]

   ∴ Sample space = {__,__,__,__,__,__}

2. Find the value of following determinant.

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

Ans: $\begin{vmatrix} \frac{7}{3} & \frac{5}{3} \\ \frac{3}{2} & \frac{1}{2} \end{vmatrix}$

$= \left(\frac{7}{3} \times \frac{1}{2}\right) - \square$

$= \frac{7}{6} - \frac{15}{6}$

$= \square$

$= \square$

$= \square$.

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

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

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

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

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

$= 27 \times 45$

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

Q.2. B) Solve the following questions. (Any four) (8)

1. Find the amount received when 300 shares of FV Rs. 100, were sold at a discount of Rs. 30.
2. Determine the nature of roots of the following quadratic equations from their discriminant.

   $2y^2 - 7y + 2 = 0$
3. A card is drawn at random from a pack of well shuffled 52 playing cards. Find the probability that the card drawn is -

   (i) an ace. (ii) a spade.
4. In year 2015, Mrs. Shaikh got a job with salary Rs. 1,80,000 per year. Her employer agreed to give Rs. 10,000 per year as increment. Then in how many years will her annual salary be Rs. 2,50,000?
5. Solve the following simultaneous equations.

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

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

1. The product of ages of Pragati 2 years ago and 3 years after is 84. Find her present age.

Ans: Let the present age of Pragati be x years.

Pragati's age 2 years ago = $\square$ years and 3 years after = $\square$ years According to given condition

$\square = 84$

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

$\therefore\ x^2 + 3x - 2x - 6 = 84$

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

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

$\therefore\ \square = 0$

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

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

$\therefore\ x + 10 = 0$ or $x - 9 = 0$

$\therefore\ x = -10$ or $x = 9$

Now age cannot be negative

$\therefore\ x \neq -10$

$\therefore\ x = \square$

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

2. M/s. Jay Chemicals purchased a liquid soap for Rs. 8000 (with GST) and sold it to the consumers for Rs. 10,000 (with GST). Rate of GST is 18%. Find the amount of CGST and SGST to be paid by Jay Chemicals.

Ans: Here, the prices are including GST.

Total value (value with GST)

= Taxable value + ☐

If the taxable value of liquid soap is Rs. 100, then the total value is Rs. 118.

The ratio of $\frac{\text{Total Value}}{\text{Taxable Value}}$ is constant as the rate of GST is same.

i. For total value of Rs. 118, the taxable value is Rs. 100 and for total value of Rs. 8000, let the taxable value be Rs. x .

$\therefore \frac{x}{8000} = \frac{100}{118}$

$\therefore x = \frac{8000}{118} \times 100$ = ☐

$\therefore$ GST paid at the time of purchase

= 8000 - 6779.66

Input tax = ☐

$\therefore$ ITC = Rs, 1220.34

ii. For total value of Rs. 10,000 let the taxable value be Rs. y.

$\therefore \frac{y}{10000} = \frac{100}{118}$

$\therefore y = \frac{10,00,000}{118}$ = ☐

$\therefore$ Output tax (tax collected)

= 10000.00 –8474.58 = ☐ ... (II)

$\therefore$ GST payable = Output tax - Input tax

= 1525.42 - 1220.34

= ☐

$\therefore$ Payable CGST = Payable SGST

= 305.08 ÷ 2 = Rs. 152.54

Jay Chemicals has to pay Rs. 152.54 CGST and Rs. 152.54 SGST.

Q.3.B) Solve the following questions.
(Any two) **(6)**

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

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

2. Check whether 301 is in the sequence 5, 11, 17, 23, ... ?

3. Determine the nature of roots of the following quadratic from their discriminant.

$3x^2 - 5x + 7 = 0$

4. Mr. Rohit is a retailer. He paid GST of Rs. 6500 at the time of purchase. He collected GST of Rs. 8000 at the time of sale. (i) Find his input tax and output tax. (ii) What is his Input tax credit ? (iii) Find his payable GST. (iv) Hence find the payable CGST and payable SGST.

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

1. Solve the following simultaneous equations graphically. $x + y = 6$; $x - y = 4$

2. The following table shows the average rainfall in 150 towns. Show the information by a frequency polygon.

Average rainfall (cm)	0–20	20–40	40–60	60–80	80–100
No. of towns	14	12	36	48	40

3. The roots of quadratic equation

$(m - 12)x^2 + 2(m - 12)x + 2 = 0$ are real and equal then find the value of m.

5. Solve the following questions.
(Any one) **(3)**

1. Write sample space 'S' and number of sample point n(S) for each of the following experiments. Also write events A, B, C in the set form and write n(A), n(B), n(C). Three coins are tossed simultaneously.

i)Condition for event A : To get at least two heads.

ii) Condition for event B : To get no head.

iii)Condition for event C : To get head on the second coin.

2. The following frequency distribution table shows the classification of the number of vehicles and the volume of petrol filled in them. Find the mode of the volume.

Petrol filled (Litre)	1–3	4–6	7–9	10–12	13–15
No. of vehicle	33	40	27	18	12

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