SHIKSHA CLASSES

Subject : Algebra **Prelim Question Paper - 1** **Marks : 40**

Class : X **Time : 2 Hr.**

Q. 1 A. Choose the correct alternative. **4**

1) **The first four terms of an A.P. having the first term –2 and the common difference –2 are**

a) –2, 0, 2, 4 b) –2, 4, –6, –8

c) –2, –4, –6, –8 d) –2, –4, –8, –16

2) **For $\sqrt{2}x^2 - 5x + \sqrt{2} = 0$ find the value of the discriminant?**

a) –5 b) 17

c) $\sqrt{2}$ d) $2\sqrt{2} - 5$

3) **If 217x + 131y = 913,**
131x + 217y = 827 then x + y is.

a) 5 b) 6

c) 7 d) 8

4) **What is the probability of the event that a number choosen from 1 to 100 is a prime number?**

a) $\frac{1}{5}$ b) $\frac{6}{25}$

c) $\frac{1}{4}$ d) $\frac{13}{15}$

B. Solve the following sub questions. **4**

1) Find the value of $\begin{vmatrix} 4 & 3 \\ 2 & 7 \end{vmatrix}$.

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

3) In an AP, if d = – 4, n = 7, and $t_n = 4$ then find the value of a.

4) Find K if x = 3 is a root of equation $kx^2 - 10x + 3 = 0$.

Q. 2 A. Complete any TWO of the following activities. **4**

1) If two coins are tossed, find the probability of the following events.

Getting at least one head.

→ Let S be the sample space

Then S = { ☐ }

∴ n(S) = ☐

Let A be the event where atleast one head turns up

Then A = { ☐ }

∴ n(A) = 3

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

∴ $P(A) = \frac{\square}{\square}$

2) The sum of two numbers is 1000 and difference between their squares is 256000 then find the numbers.

Let the two number are x and y

According to first condition

☐ + ☐ = 1000 ---(i)

According to second condition

$\square + \square = 256000$ ---(ii)

$(x + y)(x - y) = 256000$

But $x + y = 1000$

$1000(x - y) = 256000$

$$x - y = \frac{256000}{1000}$$

$x - y = \square$ ---(iii)

Adding equation (i) and (iii)

$$\begin{array}{r} x + y = 1000 \\ + \\ x - y = \square \\ \hline 2x = 744 \end{array}$$

$$x = \frac{744}{2}$$

$x = \square$

Put $x = 372$ i equation (i)

$x + y = 1000$

$372 + y = 1000$

$y = 1000 - 372$

$y = \square$.

3) Which term of the AP 27, 24, 21, ----- is zero?

$a = 27, d = \square, t_n = 0$

$\therefore$ $t_n = \square$ --- formula

$0 = 27 + (n - 1)\square$

$0 = 27 - 3n + 3$

$3n = \square$

$n = \square$

$\square$ term of given AP is zero.

B. Solve any Four of the following subquestions. 8

1) Solve the following using formula method $5m^2 - 4m - 2 = 0$.

2) 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

3) Divide 207 into three parts such that the numbers are in A.P. and the product of the two smaller parts is 4623.

4) Solve the following simultaneous equations graphically $x + y = 5, x - y = 3$

5) Determine nature of roots of the quadratic equation

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

Q. 3 A. Complete any ONE of the following activities. 3

1) ₹1000 is invested at 10% simple interest check at the end of every year if the total interest amount is in AP. If this is an AP then find interest amount after 20 years. For this complete the following activity.

$$\text{Simple interest} = \frac{P \times R \times N}{100}$$

Simple interest after 1 year =

$$\frac{1000 \times 10 \times 1}{100} = \square$$

Simple interest after 2 year =

$$\frac{1000 \times 10 \times 2}{100} = \square$$

Simple interest after 3 year =

$$\frac{\square \times \square \times \square}{100} = 300$$

According to this simple interest for 4, 5, 6 years will be 400, $\square$, $\square$ respectively from this d = $\square$, and a = $\square$ Amount of simple interest after

20 year

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

$t_{20} = \square + (20 - 1)\ \square$

$t_{20} = \square$

Amount of simple interest after 20 year

is = $\square$

2) A bag contains 3 red, 3 white and 3 green balls. One ball is taken out of the bag at random. What is the probability that the ball drawn is

i) red, ii) not red, 3) either red or white

Total number of ball = 3 + 3 + 3 = 9

number of red balls 3

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

i) Event A : Ball drawn is a red ball

$\therefore\ n(A) = 3$

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

$$= \frac{3}{\square}$$

$$= \frac{1}{3}$$

Hence the probability that a red ball is drawn $= \frac{1}{3}$.

ii) Event B - Ball drawn is not red.

Number of balls which are not red

= 3 + 3 = 6

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

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

$$= \frac{\square}{\square}$$

$$= \frac{2}{3}$$

Hence the probability that a ball drawn is not red $= \frac{2}{3}$.

iii) Event C - Ball drawn is either red or white

Number of red and white balls

= 3 + 3 = 6

$\therefore\ n(C) = 6$

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

$$= \frac{6}{\square}$$

$$= \frac{2}{3}$$

Hence the probability that a ball drawn is either red or white $= \frac{2}{3}$.

B Solve any TWO of the following sub questions. 6

1) The A.P. in which 4th term is – 15 and 9th term is – 30. Find the sum of the first 10 numbers.

2) Pintu takes 6 days more than those of Nishu to complete certain work. If they work together they finish it in 4 days. How many days would it take to complete the work if they work alone?

3) In a factory the ratio of salary of skilled and unskilled workers is 5 : 3. Toral salary of one day of both of them is ₹ 720. Find daily wages of skilled and unskilled workers.

4) 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

iii) a face card.

Q. 4 Solve any TWO of the following sub questions. **8**

1) A two digit number and the number with digits interchanged add up to 143. In the given number the digit in unit's place is 3 more than the digit in the ten's place. Find the original number.

2) A manufacturer of TV sets produced 600 sets in the third year and 700 sets in the seventh year. Assuming that the production increases uniformly by a fixed number every year find.

i) the production in the 1^{st} year

ii) the production in the 10^{th} year

iii) the total production in first 7 years.

3) An express train takes 1 hour less than a passenger train to travel 132 km between Mysore and Banglore (without taking into consideration the time they stop at intermediate station) if the average speeds of the express train is 11 km /h more than that of the passenger train. Find the average speed of the two trains.

Q. 5 Solve any ONE of the following question. **3**

1) Ajay sharma repays the borrowed amount of ₹ 3,25,000 by paying ₹ 30500 in the first month and then decreases the payment by ₹ 1500 every month. How long will it take to clear his amount?

2) Two dice are rolled, write the sample space 'S' and number of sample point n(s). Also write events and number of sample points in the event according to the given condition.

i) Sum of the digits on upper face is a prime number

ii) Sum of the digits on the upper face is a multiple of 5

iii) Sum of the digits on the upper face is 25.

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