

VELAMMAL BODHI CAMPUS

SUBJECT: MATHEMATICS

UNIT – I

MARKS: 40

GRADE: X

TIME: 1HR 30 MINS

I. Answer the following:

5X1=5

1. HCF of two numbers is 27 and their LCM is 162. if one of the number is 54, then the other number is

- a) 36 b) 35 c) 9 d) 81

2. If $2520 = 2^a \times 3^b \times 5^c \times 7^d$, then $a+b-2c-3d =$ _____

- a) 1 b) 0 c) 2 d) 3

3. If one of the zeros of the quadratic polynomial $(k-1)x^2 + Kx + 1$ is -3, then the value of K is

- a) $\frac{4}{3}$ b) $-\frac{4}{3}$ c) $\frac{2}{3}$ d) $-\frac{2}{3}$

4. The sum of the digits of a two digit number is 9. if 27 is added to it, the digits of the number to get reversed. The number is

- a) 25 b) 72 c) 63 d) 36

5. The value of K for which the system of equations $Kx - y = 2$ and $6x - 2y = 3$ has a unique solution, is

- a) $K=3$ b) $K \neq 3$ c) $K \neq 0$ d) $K=0$

Section - B

4X2=8

6. Given that $\sqrt{2}$ is irrational, prove that $(5+\sqrt{2})$ is an irrational number.

7. If α and β are the zeros of the polynomial $f(x) = x^2 + px + q$, form a polynomial whose zeros are $(\alpha + \beta)^2$ and $(\alpha - \beta)^2$.

8. In a shop the cost of 2 pencils and 3 erasers is Rs. 9 and the cost of 4 pencils and 6 erasers is Rs.18. find the cost of each pencil and each eraser.

9. Solve: $\sqrt{2}x + \sqrt{3}y = 0$ and $\sqrt{3}x - \sqrt{8}y = 0$.

SECTION - C

3X3=9

10. There is a circular path around a sports field. Priya takes 18 minutes to drive one round of the field, while Rashi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point?

11. If α, β are the zeros of the polynomial $f(x) = 2x^2 + 5x + K$, satisfying the relation $\alpha^2 + \beta^2 + \alpha\beta = \frac{21}{4}$, then find the value of K for this to be possible.

12. A fraction becomes $\frac{1}{3}$ when 2 is subtracted from the numerator and it becomes $\frac{1}{2}$ when 1 is subtracted from the denominator. Find the fraction.

SECTION – D**2x5=10**

13. A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid Rs.27 for a book kept for seven days, while susy paid Rs. 21 for the book she kept for five days. Find the fixed charge and the charge for each extra day.

14. If α and β are the zeros the polynomial $2x^2 - 4x + 5$, find the value of

i) $\alpha^2 + \beta^2$

ii) $\frac{1}{\alpha} + \frac{1}{\beta}$

iii) $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$

iv) $(\alpha - \beta)^2$

SECTION - E**2x4=8**

15. Lavanya wants to organise her birthday party. She is very happy on her birthday. She is very health conscious, thus she decided to serve fruits only in her birthday party. She has 36 apples and 60 bananas at home and decided to serve them. She wants to distribute fruits among guests. She does not want to discriminate among guests, so she decided to distribute fruits equally among all.

i) How many maximum guests Lavanya can invite?

ii) Lavanya decide to add 42 mangoes also.

In this case how many maximum guests Lavanya can invite.

iii) How many total fruits will each guest get?

(or)

How many apples and bananas will each guest get?

16) An asana is body posture, originally and still a general term for a sitting meditation pose, and later extended in hat ha, yoga and modern yoga as exercise, to any type of pose or position adding reclining, standing, inverted, twisting, and balancing poses. In the figure one can observe that poses can be related to representation of quadratic polynomial.



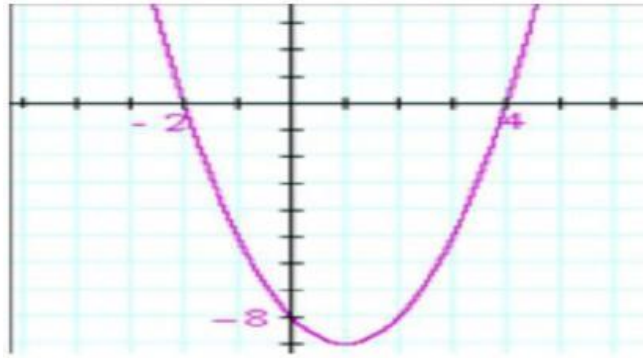
i) The shape of the poses shown is

- a) Spiral b) ellipse c) linear d) parabola

ii) The graph of parabola opens downwards, if

- a) $a \geq 0$ b) $a = 0$ c) $a < 0$ d) $a > 0$

iii) Two zeros in the graph are



- a) 2,4 b) -2,4 c) -8,4 d) 2,-8

(or)

The zeros of the quadratic polynomial $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$ are

- a) $\frac{\sqrt{3}}{4}, \frac{-2}{\sqrt{3}}$ b) $\frac{-2}{3}, \frac{\sqrt{3}}{4}$ c) $\frac{2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$ d) $\frac{-2}{\sqrt{3}}, \frac{-\sqrt{3}}{4}$
