KV NO. 2, AFS KALAIKUNDA

SUMMER BREAK HOLIDAY HOMEWORK (2021)

MATHEMATICS

CLASS - 10

Q1) If LCM (480, 672) = 3360, find HCF (480,672).

Q2) Find the HCF of 612 and 1314 using prime factorisation.

Q3) Find the zeroes of the following polynomials by factorisation method and verify the relations between the zeroes and the coefficients of the polynomials:

    i. $4x^2 - 3x - 1$ ii. $5t^2 + 12t + 7$

    iii. $4x^2 + 5x - 3$ iv. $t^3 - 2t^2 - 15t$

Q4) For each of the following, find a quadratic polynomial whose sum and product of the zeroes are respectively as given. Also find zeros.

    i. $\sqrt{2}$, -3/2   ii. -2, -9

Q5) Find a quadratic polynomial whose zeroes are $3 + \sqrt{5}$ and $3 - \sqrt{5}$.

Q6) State Euclid's division lemma.

Q7) State Fundamental theorem of Arithmetic.

Q8) Prove that following numbers are irrational number

    A. $\sqrt{2}$

    B. $3 - 5\sqrt{5}$

    C. $2 + 3\sqrt{7}$.

Q9) Show that the square of any positive integer is of the form 4q, 4q + 1 for some integer.

Q10) If a and b are the zeroes of the quadratic polynomial $f(x) = x^2 - 2x + 3$, then find a quadratic polynomial whose zeroes are (a-1)/(a+1) and (b-1)/(b+1).

Q11) Show that cube of any positive integer is of the form 4m , 4m +1 or 4m +3 for some integer m.

Q12) If one zero of the quadratic polynomial $2x^2 + px + 4$ is 2, find the other zero. Also, find the value of p.

Q13) Using Euclid's division algorithm, find which of the followings are co-prime:

    i.   231, 396   ii. 847, 2160

Q14) Show that the number in the form 7^n, n is a natural number, can't not have unit digit zero.

Q15) Given that 2 is a zero of the cubic polynomial $6x^3 + 2x^2 - 10x - 4$, find its other two zeroes.

Q16) Find all the zeroes of the polynomial $+ - 34x^2 - 4x + 120$, if two of its zeroes are 2 and -2.

Q17) Represent the situation as pair of linear equations in two variables.

A. Points A and B are 90 km apart from each other on a highway. A car starts from A and another from B at the same time. If they go in the same direction they meet in 9 hours and if they go in opposite directions they meet in 9/4 hours. Find their speeds.

B. A train covered a certain distance at a uniform speed. If the train would have been 10 km/h faster, it would have taken 2 hours less than the scheduled time. And, if the train were slower by 10 km/h; it would have taken 3 hours more than the scheduled time. Find the distance covered by the train.

Q18)CASE STUDY BASE QUESTIONS

Soaring high above a rugged canyon or a city street, a peregrine falcon spots its prey. The falcon accelerates, then transforms its body into the shape of a speeding bullet by pointing its head down and tucking in its wings and feet. Within seconds of beginning its dive, called a stoop, the peregrine falcon can reach speeds of up to 217 miles per hour.

About the same size as a crow, peregrine falcons are predators with streamlined bodies and long, pointed wings. The falcon's wings are strong enough to give it the power to carry its prey back to a nest in the cliffs or a top a high-rise city building. But the specialized wings of this falcon provide more than just strength. They also enable the peregrine falcon to claim the title of the fastest-moving animal on the earth.

Suppose that the height, in feet, of a peregrine falcon t seconds after it starts diving toward its prey is modelled by the quadratic function
$h(t) = -16t^2 - 20t + 1000$.

(a)	What is the sum of the zeros of the above polynomial ? i) 1.25 ii) 2.5 iii) -1.25 iv) 5
(b)	What is the product of zeroes of the given polynomial ? i) 62.5 ii) -62.5 iii) -61.25 iv)62.05
(c)	If the falcon is on 500ft tall building, how long it will take to reach to the prey? i) 10 seconds ii) 7 seconds iii) 5 seconds iv) 13 seconds
(d)	What will be the height of the peregrine falcon in 2 seconds after it starts diving toward its prey? i) 869 ft ii) 896ft ii) impossible to find out iv) 890ft
e)	What is the nature of the given quadratic equation $-16t^2 - 20t + 1000 = 0$? i)Real and unequal ii) Real and equal iii)Does not exist iv)None