***10<sup>th</sup> Standard Mathematics***

***Important Questions For APR - 25***

**PART - 1**

**Note: There is some creative and 1 mark sums . *LEARN ALL***

*1.*Let A = The set of all natural numbers less than 8, B = The set of all prime numbers less than 8, C = The set of even prime number. Verify that

   **(i)**      (A∩B) x C = (AxC)∩(BxC)
   **(ii)**     Ax(B-C)=(AxB)-(AxC)

*2.*Represent each of the given relations by (a) an arrow diagram, (b) a graph and (c) a set in roster form, wherever possible.

   **(i)**      {(x,y) x = 2y, x ∈ {2,3,4,5}, y ∈ {1,2,3,4}}
   **(ii)**     {(x,y) y = x+3, z, y are natural numbers < 10}

*3.*A function f is defined by f(x) = 2x – 3

   **(i)**      Find f(0)+f(1) /2
   **(ii)**     Find x such that $f(x)$ = 0.
   **(iii)**    Find x such that f(x) = x.
   **(iv)**     Find x such that f(x) = f(1-x).

*4.*The function (T) which maps temperature in Celsius © into temperature in Fahrenheit (F) is defined by t(c) = F where F =C+32. Find,

   **(i)**      T(0)
   **(ii)**     T(28)
   **(iii)**    T(-10)
   **(iv)**     The value of C when T(c) = 212
   **(v)**      The temperature when the Celsius value is equal to the Farenheit value.

*5.*If f(x) = 3x-2, g(x) = 2x + k and if fog = gof, then find the value of k.

*6.*If f(x) = 2x -1, g(x) = +, 2 , show that fog=gof = x

*7.* If f(x) = x ^ 2 – 1, g(x) = x – 2 find a, if go f(a) = 1.

8.Find the HCF of 396, 504, 636.

*9.*'a' and 'b' are two positive integers such that a × b = 800. Find 'a' and 'b.

**10**.Is 7×5×3×2+3 a composite number? Justify your answer.

**11**.If 13824 = 2^a x 3^b then find a and b.

**12**.Solve 5x = 4 (mod 6)

**13**.Find the $19^{th}$ term of an A.P. -11,15,19,...

**14**.The product of three consecutive terms of a Geometric Progression is 343 and their sum is 91/3.Find the three terms.

**15**.Find the sum to n terms of the series 2+22+222+...

**16**.Find the GCD of the given polynomials

  **(i)**      $X^2 + 3x^3$-x-3 ,  $x^2$ +x^2 – 5x + 3

**17**.Show that the points P(-1.5,3), Q(6,-2), R(-3,4) are collinear.

**18**.If vertices of a quadrilateral are at A(-5,7), B(-4,k), C(-1,-6) and D(4,5) and its area is 72 sq.units. Find the value of k.

**19**.Find the slope of a line joining the given points

  **(i)**      (-6,1) and (-3,2)
  **(ii)**     (14,10) and (14,-6)

**20**.Without using Pythagoras theorem, show that the points (1,-4), (2,-3) and (4,7) form a right angled triangle.

**21**.Find the equation of a line which passes through (5,7) and makes intercepts on the axes equal in magnitude but opposite in sign.

**22**.Show that the straight lines 2x+3y-8=0 and 4x+6y+18=0 are parallel .

**23**.Show that the straight lines-2y+3=0 and 6x + 3y + 8 = 0 are perpendicular.

**24**.Find the slope of the straight line 6x -3y + 7 = 0.

**25**.Find the equation of a straight line through the point of intersection of the lines 8x + 3y = 18, 4x+5y=9 and bisecting the line segment joining the points (5,-4) and (-7,6).

**26**.Prove that $\tan^2 0 – \sin^2 0 = \tan^2 0 \sin^2 0$.

**27**.Prove that $\sin^2 A \cos^2 B + \cos^2 A\sin^2 B + \cos^2 A \cos^2 B + \sin^2 A\sin^2 B = 1$.

**28**.A flag pole of height 'h metres is on the top of the hemispherical dome of radius 'r' metres. A man is standing Z m away from the dome. Seeing the top of the pole at an angle45° and moving 5 m away from the dome and seeing the bottom of the pole at an angle 30°.Find (i) the height of the pole  (ii) radius of the dome. **($\sqrt{3}$ = 1.732)**
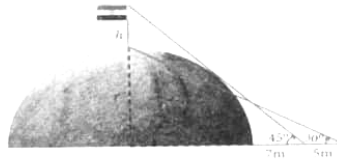


**29**.The internal and external diameters of a hollow hemispherical vessel are 20 am and 28 cm respectively. Find the cost to paint the vessel all over at 0.14 per $cm^2$.

**30**.The volume of a solid right circular cone is 11088 $cm^3$. If its height is 24 cm then find the radius of the cone.

**31**.A toy is in the shape of a cylinder surmounted by a hemisphere. The height of the toy is 25 cm. Find the total surface area of the toy if its common diameter is 12cm. ***DIAGRAM MUST***

**32**.A funnel consists of a frustum of a cone attached to a cylindrical portion 12 cm long attached at the bottom. If the total height be 20 cm, diameter of the cylindrical portion be 12 cm and the diameter of the top of the funnel be 24 cm. Find the outer surface area of the funnel. ***DIAGRAM MUST***

**33**.A metallic sphere of radius 16 cm is melted and recast into small spheres each of radius 2 cm. How many small spheres can be obtained?

**34**.In a class of 50 students, 28 opted for NCC, 30 opted for NSS and 18 opted both NCC and NSS. One of the students is selected at random. Find the probability that

- **(i)**    The student opted for NCC but not NSS.
- **(ii)**   The student opted for NSS but not NCC.
- **(iii)**  The student opted for exactly one of them.

**35**.Two unbiased dice are rolled once. Find the probability of getting

- **(i)**    A doublet *(equal numbers on both dice)*
- **(ii)**   The sum as a prime number
- **(iii)**  The product as a prime number
- **(iv)**   The sum as 1

**36.**Rekha has 15 square colour papers of sizes 10 cm, 11 cm, 12 cm,..., 24 cm. How much area can be decorated with these colour papers?

**37.**If 1+2+3+... + n = 666 .then find n.

**38.**Find the square root of $64x^2 - 16x^3 + 17x^2 - 2x + 1$.

**39.**Solve the following quadratic equations by completing the square method.

   **(i)** 9x12x+4=0

**40.**Solve the following quadratic equations by formula method.

   **(i)**$2x^2 - 5x + 2 = 0$

**41.**a,b,c are in AP then prove that$(a - c)^2 = 4(b^2 - ac)$.

**42.**In a two children family, find the probability that there is at least one girl in a family.

**43.**The height of the cone is 15 cm. If its volume is 1570 cm³, find the radius of the base.

**44.**Find the sum to n terms of the series 0.6 + 0.66 + 0.666 +.... + n.

**45.**Prove that $sec^2 0 + cosec^2 0 = sec^2 0 \, cosec^2 0$ .

**46.**Two ships are sailing in the sea on either sides of a lighthouse. The angle of elevation of the top of the lighthouse as observed from the ships are 30° and 45° respectively. If the lighthouse is 200 m high, find the distance between the two ships. **($\sqrt{3}$= 1.732).**

**47.**Find the sum of all natural number between 300 and 600 which is divisible by 7.

**48.**The value of $sin^2 0 + 1/1+ tan$ is equal to.

**49.**(1+ tan 0+ sec 0)(1 + cot 0 – cosec 0) is equal to.

**50.**A tower is 60 m high. Its shadow reduces by z metres when the angle of elevation of the sun increases from 30° to 45° then z is equal to.