VISWESHWARA MATRICULATION SCHOOL UTHUKOTTAI 2022-2023
MODEL QUARTERLY EXAMINATION

Std: 10th **Marks : 100**

Sub: Mathematics **PART-I [Marks 14]**

Answer all the 14 questions

1. If there are 1024 relations from a set A = {1, 2, 3, 4, 5} to a set B, then the number of elements in B is
   (a)3 (b)2 (c)4 (d)8
2. If f: A B is a bijective function and if n (B) = 7, then n (A) is equal to
   (a) 7 (b) 49 (c)1 (d)14
3. The range of a function is a subset of its _____
   (a) Co domain (b) Domain (c) Unique (d) Constant
4. The sum of the exponents of the prime factors in the prime factorization of 1729 is
   (a) 1 (b) 2 (c) 3 (d) 4
5. If the HCF of 65 and 117 is expressible in the form of 65m- 117, then the value of m is
   (a) 4 (b) 2 (c) 1 (d) 3
6. If (x -6) is the HCF of and hen the value of k is
   a) 3 b) 5 c) 6 d) 8
7. Which of the following should be added to make x^4+64 perfect square
   (a)$4x^2$ (b)$16x^2$ c)$8x^2$ d) $-8x^2$
8. If (5, 7), (3, p) and (6, 6) are collinear, then the value of p is
   (a) 3 (b) 6 (c) 9 (d) 12
9. The inclination of X axis and every line parallel to X axis is
   (a) 0^o (b) 90^o (c) 45^o (d) 60^o
10. The slope of the line which is perpendicular to a line joining the points (0,0) and (–8,8) is
    (a) -1 b) 1 (c) 1/3 (d) -8
11. a cot θ + b cosecθ= p and b cotθ + a cosecθ = q then $p^2 - q^2$ is equal to
    (A) a^2-b^2 (B) b^2-a^2 (C) a^2+b^2 (D) b – a
12. tan θ cosec ^{2}θ - tan θ is equal to
    (A) sec θ (B) cot ^{2}θ (C) sin θ (D) cot θ
13. Graph of a linear polynomial is a
    (a) straight line (b) circle (c) parabola (d) hyperbola
14. If in triangles ABC and EDF, AB/ DE BC /FD = then they will be similar, when
    (A) ∠ B=∠E (B) ∠ A=∠D (C) ∠B =∠D (D) ∠A = ∠F

PARTS-II [MARKS: 20]

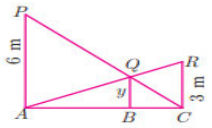
Answer all the questions [Question number 28 is compulsory] 10x2=20

15. Let A={1,2,3}and B={x|x is a prime number less than 10}.Find A x B and B x A.
16. If B×A = {(-2,3), (-2,4), (0,3), (0,4, (3,3), (3,4)} find A and B.
17. Find k, if f (k) =2k-1 and f o f (k) =5
18. Find the 19th term of an A.P.-11,-15,-19…….
19. Find the sum 3 +1+ 1/ 3 + …….+∞
20. Find the value of 1 +2 + 3+…….. 50
21. Determine the nature of roots for the quadratic equations $9x^2-24x+16=0$
22. Write down the quadratic equation in general form for which sum and product of the roots are given below 5/3, 4
23. Solve 2x-3 y = 6, x+ y = 1
24. If △ ABC is similar to △ DEF such that BC=3 cm, EF=4 cm and area of△ ABC = 54 cm^2. Find the area of △ DEF .
25. The perimeters of two similar triangles ABC and PQR are respectively 36 cm and 24 cm. If PQ =10 cm, find AB
26. The line r passes through the points (–2, 2) and (5, 8) and the line **S** passes through the points (–8, 7) and (–2, 0). Is the line **r** perpendicular to **S**?
27. Calculate the slope and y intercept of the straight line 8x-7y+6=0
28. Prove that secθ – cosθ = tanθ sinθ

PARTS-III [MARKS: 50]

Answer all the questions[Question number 42 is compulsory] **10x5=50**

29. Let A={x€N|1<x<4}, B={x€W|0≤x<2} and C={x € N |x<3} then verify that A x (BUC) = (A x B) U (A x C)
30. If f(x) =2x+3, g(x) =1-2x and h(x)=3x prove that fo(goh)=(fog)oh
31. Let A = {1, 2, 3, 4} and B = {2, 5, 8, 11, 14} be two sets. Let f: A B be a function given by f(x) =3x-1. Represent this function (i) by arrow diagram (ii) in a table form (iii) as a set of ordered pairs (iv) in a graphical form
32. Find the sum to n terms of the series 5+55 +555+……n terms
33. The sum of three consecutive terms that are in A.P. is 27 and their product is 288. Find the three terms
34. Find the sum of 10^3+11^3+…….$+23^3$
35. A passenger train takes 1 hr more than an express train to travel a distance of 240 km from Chennai to Virudhachalam. The speed of passenger train is less than that of an express train by 20 km per hour. Find the average speed of both the trains.
36. Find the values of m and n if the polynomials are perfect squares $x^4-8x^3+mx^2+nx+16$
37. Find the GCD of the polynomials x^3+x^2-x+2 and $2x^3-5x^2+5x-3$
38. . Two vertical poles of heights 6 m and 3 m are erected above a horizontal ground AC. Find the value of y.



39. Find the area of the quadrilateral formed by the points (–9, –2), (-8, –4), (2, 2) and (1, –3)
40. A (-3,0)B(10,-2) and C(12,3) are the vertices of ΔABC . Find the equation of the altitude through A
41. If cosα/cosβ = m and cosα/sinβ = n , then prove that $(m^2+n^2)\cos^2\beta=n^2$
42. Find the equation of a straight line through the intersection of lines 5x -6y=2, 3x +2y=10 and perpendicular to the line 4x-7y +13=0

PARTS-IV [MARKS: 16]

Answer both questions **2x8=16**

43. a) Construct a triangle similar to a given triangle PQR with its sides equal to 6/ 5 of the corresponding sides of the triangle PQR (scale factor 6/5)

(**OR**)

b) Construct a triangle similar to a given triangle PQR with its sides equal to 2/ 3 of the corresponding sides of the triangle PQR (scale 2/3)

44. (a) A company initially started with 40 workers to complete the work by 150 days. Later, it decided to fasten up the work increasing the number of workers as shown below.

Number of workers (x)	40	50	60	75
Number of days (y)	150	120	100	80

(i) Graph the above data and identify the type of variation.

(ii) From the graph, find the number of days required to complete the work if the company decides to opt for 120 workers?

(iii) If the work has to be completed by 200 days, how many workers are required?

(**OR**)

(b) Varshika drew 6 circles with different sizes. Draw a graph for the relationship between the diameter and circumference (approximately related) of each circle as shown in the table and use it to find the circumference of a circle when its diameter is 6 cm.

Diameter (x) cm	1	2	3	4	5
Circumference (y) cm	3.1	6.2	9.3	12.4	15.5

M. SARATHKUMAR B.Sc., M.Ed.,
Mobile No: 8122665774