Tsi10M

Tenkasi District
Common Quarterly Examination - 2024

25-09-2024

Standard 10
MATHEMATICS

Time: 3.00 Hours Marks: 100

I. Answer of all the following questions: 14x1=14

1) A = {a, b, q} B = {2, 3} C = {p, q, r, s} then n{(A∪C)×B} is
a) 8 b) 20 c) 12 d) 16

2) $f(x)=(x+1)^3-(x-1)^3$ represents a funciton which is
a) linear b) cubic c) reciprocal d) quadratic

3) If the HCF of 65 and 117 expressible in the form of 65m−117, then the value of m is
a) 4 b) 2 c) 1 d) 3

4) Given $F_1 = 1$, $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then F_5 is
a) 3 b) 5 c) 8 d) 11

5) If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + \ldots\ldots + 2^0$ which of the following is true?
a) B is 2^{64} more than A b) A and B are equal
c) B is larger than A by 1 d) A is larger than B by 1

6) $y^2 + \frac{1}{y^2}$ is not equal to
a) $y^4 + \frac{1}{y^4}$ b) $\left(y + \frac{1}{y}\right)^2$ c) $\left(y - \frac{1}{y}\right)^2 + 2$ d) $\left(y - \frac{1}{y}\right)^2 - 2$

7) Graph of a linear equation is a
a) straight line b) circle c) parabola d) hyperbola

8) If $f(x) = 2x^2$ and $g(x) = \frac{1}{3x}$, then fog is
a) $\frac{3}{2x^2}$ b) $\frac{2}{3x^2}$ c) $\frac{2}{9x^2}$ d) $\frac{1}{6x^2}$

9) In ΔLMN, $\angle L = 60^\circ$, $\angle M = 50^\circ$ $\Delta LMN \sim \Delta PQR$ If then value of $\angle R$ is
a) 40° b) 70° c) 30° d) 110°

10) In a ΔABC, AD is the bisector of $\angle BAC$ If AB=8cm, BD=6cm and DC=3cm. The length of the side AC is
a) 6 cm b) 4 cm c) 3 cm d) 8 cm

11) The straight line given by the equation x=11 is
a) Parallel to x-axis b) Parallel to y-axis
c) Passing through the orgin d) Passing through the point (0, 11)

12) The slope of the line Joining (12, 3) (4, a) is $\frac{1}{8}$ The value of 'a' is
a) 1 b) 4 c) −5 d) 2

13) When proving that a quadrilateral is a Paralleogram by using slopes you must find
a) The slopes of two sides
b) The slopes of two pair of opposite sides
c) The lengths of all sides
d) Both the lengths and slopes of two sides.

14) If $(\text{Sin}\,\alpha + \text{Cosec}\,\alpha)^2 + (\text{Cos}\,\alpha + \text{Sec}\,\alpha)^2 = K + \tan^2\alpha + \text{Cot}^2\alpha$, then the value of K is equal to
a) 9 b) 7 c) 5 d) 3

II. Answer any 10 questions. 28th question is a compulsory one: 10x2=20

15) If A={m, n}; B =ϕ, Find i) A×B ii) A×A

16) A function f is defined by f(x)=3−2x Find x such that $f(x^2)=[f(x)]^2$

17) Find the value of K, such that fog=gof f(x)=3x+2 and g(x)=6x−k

18) Use Euclid's Division Algorithm to find HCF of 340 and 412

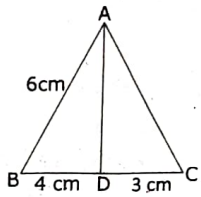
19) Find x, y and z given that the numbers x, 10, y, 24, z are in A.P

20) Simplify $\frac{5t^3}{4t-8} \times \frac{6t-12}{10t}$

21) Find the sum and product of roots for $3 + \frac{1}{a} = \frac{10}{a^2}$

22) If the difference between the roots of the equation $x^2-13x+k=0$ is 17, find K.

23) In the figure AD is the bisector of $\angle A$, If BD=4cm DC=3cm and AB=6cm, find AC.



24) Find the area of the triangle, formed by the (1, −1), (−4, 6) and (−3, −5)

25) Find the intercepts made by the line 4x−9y+36=0 on the coordinate axes

26) Show that the straight lines x−2y+3=0, 6x+3y+8=0 are perpendicular

27) Prove that $\frac{\cos\theta}{1+\sin\theta} = \sec\theta - \tan\theta$

28) Find the sum $3+1+\frac{1}{3}+\ldots..\infty$

SIVAKUMAR.M,
Sri Ram Matric Hss,
Vallam-627809
Tenkasi Dist.

III. Answer any 10 questions. 42th question is a compulsory one: 10x5=50

29) 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 $(A\cap B)\times C=(A\times C)\cap(B\times C)$

30) Let f: A → B be a function defined by $f(x) = \frac{x}{2}-1$ where A = {2, 4, 6, 10, 12} B = {0, 1, 2, 4, 5, 9}. Represent by (i) Set of ordered pairs (ii) a table (iii) an arrow diagram (iv) a graph

31) If $f(x)=x^2$, g(x) = 2x and h(x) = x + 4 show that (fog)oh = fo(goh)

32) Find the sum of all natural numbers between 300 and 600 which are divisible by 7

33) If a, b, c are three consecutive terms of an A.P and x,y,z are three consecutive terms of a G.P. Then prove that $x^{b-c}\times y^{c-a}\times z^{a-b}=1$

34) Find the sum of $9^3 + 10^3 + \ldots\ldots + 21^3$

35) Find the LCM of each pair of the following Polynomials $a^2+4a-12$, a^2-5a+6 whose GCD is a−2

36) If $9x^4+12x^3+28x^2+ax+b$ is a perfect square Find the values of 'a' and 'b'

37) If α, β are the roots of $7x^2+ax+2=0$ and if $\beta-\alpha=\frac{-13}{7}$. Find the values of 'a'

38) State and prove Angle Bisector Theorem

39) If the points A(−3, 9) B(a, b) and C(4, −5) are collinear and if a+b=1, then find 'a' and 'b'

40) If the points A(2, 2) B(−2, −3) C(1, −3) and D(x, y) form a parallelogram then find the value of 'x' and 'y'

41) Prove that $\left(\frac{\cos^3 A-\sin^3 A}{\cos A-\sin A}\right)-\left(\frac{\cos^3 A-\sin^3 A}{\cos A+\sin A}\right)=2\sin A\cos A$

42) If A(−3, 0) B(10, −2) and C(12, 3) are the vertices of ΔABC. Find the equation of the altitude through 'A'

IV. Answer all the questions. 2x8=16

43) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{4}$ of the corresponding sides of the triangle PQR (scale factor $\frac{7}{4}>1$)

(OR)

Construct a ΔPQR which the base PQ=4.5 cm $\angle R = 35^\circ$ and the median RG from R to PQ is 6 cm

44) Draw the graph of xy=24, x,y>0. Using the graph find (i) x when y = 6 (ii) y when x = 3

(OR)

A bus is travelling at a uniform speed of 50 km/hr Draw the distance time graph and hence find

i) the constant of variation
ii) how far will it travel in 90 minutes?
iii) the time required to cover a distance of 300 km from the graph.

- - - - - - -