Tsi10M

Tenkasi District
Second Revision Examination - 2024

12-02-2024

Standard 10
MATHS
Part - I

Time: 3.00 Hours Marks: 100

Choose the correct answer **14x1=14**

1) If {(a,8), (6,b)} represents an identity function, then the value of a and b are respectively
a) (8, 6) b) (8, 8) c) (6, 8) d) (6, 6)
2) $f(x) = (x + 1)^3 - (x - 1)^3$ represents a function which is
a) Linear b) Cubic c) reciprocal d) quadratic
3) 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
4) Which of the following should be added to make $x^4 + 64$ a perfect square
a) $4x^2$ b) $16x^2$ c) $8x^2$ d) $-8x^2$
5) If the value of discriminant is $\Delta = 0$, then the nature of roots are
a) real and equalroots b) real and unequal roots
c) No real roots d) None of these
6) If A is a 2×3 matrix and B is 3×4 matrix howmany columns does AB have
a) 3 b) 4 c) 2 d) 5
7) A tangent is perpendicular to the radius at the
a) centre b) point of contact c) infinity d) chord
8) The area of triangle formed by the points (−5, 0), (0, −5) and (5, 0) is
a) 0 sq.units b) 25 sq.units c) 5 sq.units d) None of these
9) If (5, 7) (3, p) and (6, 6) are collinear, then the value of 'p' is
a) 3 b) 6 c) 9 d) 12
10) Angle of Depression and Angle of Elevation are equal become they are
a) straight angles b) corresponding angles
c) alternative angles d) None of these
11) The Total Surface area of hemi-sphere is how much times the square of its radius
a) π b) 4π c) 3π d) 2π
12) The ratio of the volume of a cylinder, a cone and a sphere, If each has the same diameter and same height is
a) 1 : 2 : 3 b) 2 : 1 : 3 c) 1 : 3 : 2 d) 3 : 1 : 2
13) Variance of first 20 natural number is
a) 32.25 b) 44.25 c) 33.25 d) 30
14) Which of the following is in correct?
a) $P(A) > 1$ b) $0 \leq P(A) \leq 1$
c) $P(\phi) = 0$ d) $P(A) + P(\bar{A}) = 1$

Part - II

Answer any 10 questions. Q.No. 28 is compulsory. **10x2=20**

15) If A = {1, 3, 5} and B = {2, 3} then find A × B and B × A
16) Using the functions f and g given below. Find fog and gof for $f(x) = x - 6$, $g(x) = x^2$.
17) Use Euclid's Division Algorithm to find H.C.F of 867 and 255
18) Find the sum to infinity of 9 + 3 + 1 + ...
19) Find the excluded values of the expression $\frac{7P + 2}{8P^2 + 13P + 5}$
20) The line through the points (−2, a) and (9, 3) has slope $-\frac{1}{2}$, find the value of 'a'
21) Find the equation of a line which passes through (5, 7) and make intercepts on the axes equal in magnitude but opposite in sign
22) Prove the identity $\sqrt{\frac{1 + \sin\theta}{1 - \sin\theta}} = \sec\theta + \tan\theta$
23) From the top of a rock $50\sqrt{3}$ m high, the angle of depression of a car on the ground is observed to be 30°. Find the distance of the car from the rock
24) The radius of a spherical ballon increases from 12cm to 16cms as air being pumped into it. Find the ratio of the surface area of the balloons in the two cases.

25) An aluminium sphere of radius 12 cm is melted to make a cylinder of radius 8cm. Find the height of the cylinder

26) The standard deviation and coefficient of variation of data are 1.2 and 25.6 respectively. Find the value of mean.

27) What is the probability that a leap year selected at random will contain 53 saturdays.

28) If α and β are the roots of the equation $x^2 - 7x + 10 = 0$ then find the value of $\alpha^2+\beta^2$

Part - III

Answer any 10 questions. Q.No. 42 is compulsory. **10x5=50**

29) 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. Repersent this function
   i) by arrow diagram ii) in a table form
   iii) as a set of ordered pairs iv) in a graphical form

30) If f(x) = x – 4, g(x) = x^2 and h(x) = 3x – 5 show that (fog)oh=fo(goh)

31) Find the sum of all natural numbers between 300 and 600. Which are divisible by 7

32) Find the sum to n terms of the series 3 + 33 + 333 + ... to n terms

33) The sum of thrice the first number, second number and twice the third number is 5. If thrice the second number is subtracted from the sum of first number and thrice the third we get 2. If the third number is subtracted from the sum of twice the first, thrice the second, we get 1. Find the number.

34) $ax^4 + bx^3 + 361x^2 + 220x + 100$ is a perfect square. Find the values of a and b.

35) If $A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{bmatrix}$ show that $(AB)^T = B^T . A^T$

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36) State and prove Thales theorem

37) Find the equation of the Perpendicular bisector of the line joining points A(–4, 2) and B(6, –4).

38) From the top of a tree of height 13m the angle of elevation and depression of the top and bottom of another tree are 45° and 30° respectively. Find the height of the second tree ($\sqrt{3} = 1.732$)

39) A right circular cylindrical container of base radius 6 cm and height 15 cm is full of ice cream. The ice cream is to be filled in cones of height 9 cm and base radius 3 cm, having a hemispherical cap. Find the number of cones needed to empty the container.

40) Find the coefficient of variation of 24, 26, 33, 37, 29, 31

41) Three fair coins are tossed together. Find the probability of getting
   i) all heads ii) atleast one tail iii) Atmost one head iv) Atmost two tails

42) Find the area of the quadrilaterals formed by the points (8, 6) (5, 11) (–5, 12) and (–4, 3)

Part - IV

Answer all the following questions. **2x8=16**

43) a) 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 (scal factor $\frac{7}{4}$ >1)

(OR)

b) Construct a triangle ΔPQR such that QR = 5cm, $\angle P = 30°$ and the altiude from P to QR is of length 4.2 cm

44) a) The following table shows the data about the number of Pipes and the time taken to fill the same tank

No.of. pipes (x)	2	3	6	9
Time taken (in min) (y)	45	30	15	10

Draw the graph for the above data, and hence
   i) Find the time taken to fill the tank, when five pipes are used
   ii) Find the number of pipes when the time is a mintues

(OR)

b) Draw the graph of $y = x^2 - 5x - 6$ and hence solve $x^2 - 5x - 14 = 0$.

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