Ts10M

Tenkasi District Common Examinations
Common Second Revision Examination - February 2023

20-02-2023

Standard 10
MATHS

Marks: 100

Time: 3.00 Hours

PART - I 14×1=14

Note : i) **Answer all the questions.**
ii) **Choose the best answer**

1) If {(a,8) (6, 6)} represents an identity function, then the value of a and b are repectively.
   a) (8, 6) b) (8, 8) c) (6, 8) d) (6, 6)

2) If 6 times of 6th term of an AP is equal to 7 times the 7th term, then the 13th term of the AP is
   a) 6 b) 13 c) 0 d) 7

3) If the sequence $t_1, t_2, t_3, \ldots$ are in A.P then the sequence $t_6, t_{12}, t_{18}, \ldots$ is
   a) neither an Arithmetic progression nor a Geometric progression.
   b) an Arithmetic progresson
   c) a constant sequence
   d) a Geometric progression

4) A system of three linear equations in three variables is inconsistent if their planes
   a) coincides with each other b) interest in a line
   c) do not intersect d) intersect only at a point

5) For the given matrix A = $\begin{pmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 9 & 11 & 13 & 15 \end{pmatrix}$ the order of the matrix A^T is ....
   a) 3 × 4 b) 4 × 3 c) 2 × 3 d) 3 × 2

6) In the given figure ∠BAC = 90° and AD ⊥ BC then ....
   a) $AB.AC = AD^2$ b) $BD.CD = AD^2$
   c) $AB.AC = BC^2$ d) $BD.CD = BC^2$

7) A tangent is prependicular to the radius at the ....
   a) Point of contact b) Infinity
   c) chord d) centre

8) The straight line given by the equation x = 11 is
   a) Parallel to Y axis b) passing through the point (0,11)
   c) Parallel to X axis d) Passing through the origin

9) If (5, 7) (3, P) and (6, 6) are collinear, then the value of P is ....
   a) 6 b) 9 c) 3 d) 12

10) If $(\sin\alpha + \csc\alpha)^2 + (\cos\alpha + \sec\alpha)^2 = K + \tan^2\alpha + \cot^2\alpha$, then the value of K is equal to
    a) 9 b) 3 c) 5 d) 7

11) A frustum of a right circular cone is of height 16cm with radii of its ends as 8cm and 20cm. Then the volume of the frustum is .... cm^3.
    a) 3228π b) 3340π c) 3328π d) 3240π

12) If the Total surface area of a solid right circular cylinder is 200π cm^2 and its radius is 5ck, then the sum of its height and radius is ....
    a) 20 cm b) 25cm c) 30cm d) 15cm

13) If A and B are mutullay exclusive events then P(A∩B) is ....
    a) 1 b) – 1 c) 0 d) 2

14) Which of the following is incorrect?
    a) P(A) + P($\bar{A}$) = 1 b) 0 ≤ P(A) ≤ 1 c) P(A) > 1 d) P(∅) = 0
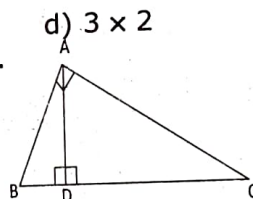
PART - II 10×2=20

Answer any ten of the following. Question Number 28 is compulsory.

15) A Relation R is given by the set {(x, y)/y = x + 3, x∈ {0, 1, 2, 3} Determine its domain and Range.

16) Find fog and gof when f(x) = 2x + 1 and g(x) = x^2 – 2.

17) Find the indicated terms of the sequences whose n^{th} term is $a_n = \dfrac{5n}{n+2}$, a_6 and a_{13}

18) Find the sum of the series 3 + 6 + 9 + ... + 96.

19) Determine the nature of the roots: $\sqrt{2}t^2 - 3t + 3\sqrt{2} = 0$

20) A = $\begin{pmatrix} 3 & 0 \\ 4 & 5 \end{pmatrix}$ B = $\begin{pmatrix} 6 & 3 \\ 8 & 5 \end{pmatrix}$ C = $\begin{pmatrix} 3 & 6 \\ 1 & 1 \end{pmatrix}$ find the matrix D, such that C + D = A + B

21) Find the square root of the following: $9x^2 - 24xy + 30xz - 40yz + 25z^2 + 16y^2$

22) The perimeters of two similar triangles ABC & PQR are resectively 36cm & 24 cm. If PQ = 10, find AB

23) The line through the points (−2,a) and (9, 3) has slop $-\frac{1}{2}$. Find the value of a.

24) A tower stands vertically on the ground. From a point on the ground, which is 48m away from the foot of the tower, the angle of elevation of the top of the tower is 30°. Find the height of the tower.

25) The volume of a solid right circular cone is 11088cm³. If its height is 24cm then find the radius of the cone.

26) The volumes of two cones of same base radius are 3600cm³ and 5040cm³. Find the ratio of heights.

27) A die is rolled and a coin is tossed simultaneously. Find the probability that the die shows an odd number and the coin shows a head.

28) Show that the square of an odd integer is of the form 4q +1, for some integer q.
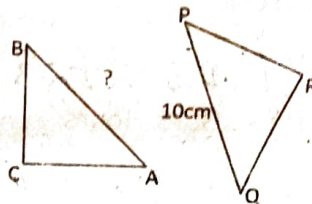
PART - III   10×5=50

Answer any ten of the following. Question Number 42 is compulsory.

29) Let A = { x ∈ N/ 1 < x < 4}, B = {x ∈ W/ 0 ≤ x < 2} and C = { x ∈ N/ x < 3} Then verify that A × (B ∩ C) = (A × B) ∩ (A × C)

30) A function f:[−5, 9] → R is defined as follows: $f(x) = \begin{cases} 6x + 1; & -5 \le x < 2 \\ 5x^2 - 1; & 2 \le x < 6 \\ 3x - 4; & 6 \le x \le 9 \end{cases}$

   i) f(−3) + f(2)   ii) $\frac{2f(2) - f(6)}{f(4) + f(-2)}$

31) The sum of first n, 2n and 3n terms of an A.P are S_1, S_2 & S_3 respectively P.T $S_3 = 3(S_2 - S_1)$.

32) If $(m+1)^{th}$ term of an A.P is twice the $(n+1)^{th}$ term, them prove that $(3m+1)^{th}$ term is twice the $(m+n+1)^{th}$ term.

33) There are 12 pieces of five, ten and twenty rupee currencies whose total value is Rs.105. When first 2 sorts are interchanged in their numbers its value will be increased by Rs.20. Find the no. of currencies in each sort.

34) If the roots of the equation $(c^2 - ab)x^2 - 2(a^2 - bc)x + b^2 - ac = 0$ are real and equal. P.T either a = 0 (or) $a^3 + b^3 + c^3 = 3abc$.

35) PQ is a chord of length 8cm to a circle of radius 5cm. The tangents at P and Q intersect at a Point T. Find the length of the tangent TP.

36) Find the equation of the median and altitude of ∆ABC through A where the vertices are A(6,2), B(−5, −1) &(1, 9).

37) Find the area of the quadrilateral formed by the points (−9, 0), (−8, 6), (−1, −2) and (−6, −3)

38) The horizontal distance between two buildings is 140m. The angle of depression of the top of the first building when seen from the top of the second building is 30°. If the height of the first building is 60m, find the height of second building ($\sqrt{3}$ =1.732)

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

40) Water is flowing at the rate of 15km per hour through a pipe of diameter 14cm into a rectanglar tank which is 50m long and 44m wide. Find the time in which the level of water in the tanks will rise by 21cm.

41) The rainfall recorded in various places of five districts in a week are given below. Find its standard deviation.

Rainfall (in mm)	45	50	55	60	65	70
No. of places	5	13	4	9	5	4

42) A passenger train takes 1hr morethan an express train to travel a distance of 240 km from chennai to virudhachalam. The speed of passenger train is less than of an express train by 20km per hour. Find the average speed of both the trains.

PART - IV

Answer all the questions.   2×8=16

43) a) Draw ∆PQR such that PQ = 6.8cm, vertical angle is 50° and the bisector of the vertical angle meets the base at D where PD = 5.2 cm. **(OR)**

   b) Construct a triangle similar to a given triangle PQR with its sides equal to 7/3 of the corresponding sides of the triangle PQR (Scale factor 7/3 > 1).

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

   b) Draw the graph of $y = x^2 +3x + 2$ and use it to solve $x^2 + 2x + 1= 0$.