Tenkasi District
Third Revision Examination - 2024

08.03.2024

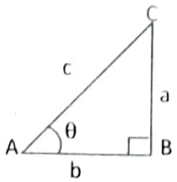
Standard 10
MATHS
Part - I

Time: 3.00 Hours | Marks: 100

Answer all the questions. **14x1=14**

Choose the correct option and with the answer with its option code

1) If the ordered pairs (a+2, 4) and (5, 2a+ b) are equal then (a, b) is
   a) (2, −2) b) (5, 1) c) (2, 3) d) (3, −2)
2) If g={(1, 1), (2, 3)(3, 5) (4, 7)} is a function given by g(x)= $\alpha x + \beta$ then the values of α and β are
   a) (−1, 2) b) (2, −1) c) (−1, −2) d) (1, 2)
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) An A.P consists of 31 terms. If its 16th term is m then the sum of all the terms of this A.P. is
   a) 16 m b) 62 m c) 31 m d) $\frac{31}{2}$ m
5) The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to
   a) $\frac{16}{5}\left|\frac{x^2z^4}{y^2}\right|$ b) $16\left|\frac{y^2}{x^2z^4}\right|$ c) $16\left|\frac{y^2}{xz^2}\right|$ d) $\frac{16}{5}\left|\frac{xz^2}{y}\right|$
6) If A and B are two matrices and AB=0 does not necessarily imply that
   a) A=0 b) B = 0 c) both A, B = 0 d) All the above
7) A tangent is prependicular to the radius at the
   a) centre b) point of contact c) Infinity d) Chord
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) If (2, 1) is the point of intersection of two lines then the equation which satisfies it is
   a) x − y − 3 = 0; 3x − y − 7 = 0 b) x + y = 3; 3x + y = 7
   c) 3x + y = 3; x + y = 7 d) x + 3y − 3 = 0; x − y − 7 = 0
10) Find the value of cosec θ + cot θ by using the diagram given
   a) $\frac{a+b}{c}$ b) $\frac{c}{a+b}$
   c) $\frac{b+c}{a}$ d) $\frac{b}{a+c}$



11) If the ratio of the height of a tower and the length of its shadow is $\sqrt{3}:1$, then the angle of elevation of the sun has measure
   a) 45° b) 30° c) 90° d) 60°
12) The total surface area of a cylinder whose radius is $\frac{1}{3}$ of its height is ..... square units.
   a) $\frac{9\pi h^2}{8}$ b) $24\pi h^2$ c) $\frac{8\pi h^2}{9}$ d) $\frac{56\pi h^2}{9}$
13) The ratio of the volumes of a cylinder, a cone and a sphere, it each has the same diameter & same height is
   a) 1 : 2 : 3 b) 2 : 1 : 3 c) 1 : 3 : 2 d) 3 : 1 : 2
14) Variance of first 20 natural numbers is
   a) 32.25 b) 44.25 c) 33.25 d) 30

Part - II

Do any 10 sums. Question No. 28 is compulsory. **10x2=20**

15) If A={1, 3, 5} and B={2, 3} then find A × B and n(A × B)
16) Find fog and gof when f(x) = 2x + 1 and g(x) = x^2 − 2
17) What is the time 100 hours after 7 a.m.?
18) Write an A.P whose first term is 20 and common difference is 8
19) Solve : 2x − 3y = 6, x + y = 1
20) Determine the nature of roots for the quadratic equation $2x^2 - 2x + 9 = 0$
21) If $A = \begin{bmatrix} 5 & 2 & 2 \\ -\sqrt{17} & 0.7 & 5/2 \\ .8 & 3 & 1 \end{bmatrix}$ then write down the order of (A) A

22) Find the length of the tangent drawn from a point whose distance from the centre of a circle is 5cm and radius of the circle is 3 cm.

23) Find the equation of a line whose inclination is 30° and making an intercept -3 on the y axis

24) Prove that $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \operatorname{cosec}\theta + \cot\theta$

25) The curved surface area of a right circular cylinder of height 14cm is $88cm^2$. Find the diameter of the cylinder.

26) The mean of a data is 25.6 and its coefficient of variation is 18.75. Find the standard deviation.

27) If $p(A) = \frac{2}{3}$, $p(B) = \frac{2}{5}$, $p(A \cup B) = \frac{1}{3}$ then find $p(A \cap B)$

28) Find the volume of a sphere whose diameter is 6cm.

Part - III

Answer any 10 questions with detailed steps. Q.No. 42 is compulsory. 10x5=50

29) Let A = The set of all natural numbers less than 8, B = The set of all prime numbers less than 8 and C = the set of even prime number. Verify that $(A \cap B) \times C = (A \times C) \cap (B \times C)$

30) 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 table (iii) as a set of ordered pairs (iv) in a graphical form.

31) The product of three consecutive terms of a Geometric progression is 343 and their sum is $\frac{91}{3}$. Find the three terms.

32) Find the sum of $15^2 + 16^2 + 17^2 + \ldots + 28^2$

33) Find the square root of the Polynomial $x^4 - 12x^3 + 42x^2 - 36x + 9$ by division method.

34) A passenger train takes 1 hour more than an express train to travel a distance of 240 km from Chennai to Virudhachalam. The speed of the express train is more than that of the passenger train of 20 km per hour. Find the average speed of both the trains.

35) If $A = \begin{vmatrix} 1 & 1 \\ -1 & 3 \end{vmatrix}$, $B = \begin{vmatrix} 1 & 2 \\ -4 & 2 \end{vmatrix}$, $C = \begin{vmatrix} -7 & 6 \\ 3 & 2 \end{vmatrix}$ verify that $A(B + C) = AB + AC$

36) State and prove angle bisector theorem

37) Find the equation of a line passing through (6, −2) and perpendicular to the line joining the points (6, 7) and (2, −3)

38) From a point on the ground , the angles of elevation of the bottom and top of a tower fixed at the top of a 30m high building are 45° and 60° respectively. Find the height of the tower $\left[\sqrt{3} = 1.732\right]$

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

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

41) Two dice are rolled together. Find the probability to getting a doublet or sum of faces as 4.

42) If l^{th}, m^{th} and n^{th} terms of an A.P are x, y, z respectively, then show that $x(m - n) + y(n - l) + z(l - m) = 0$

Part - IV

Answer the questions given below. **2x8=16**

43) a) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{3}$ of the corresponding sides of the triangle PQR (scale factor $\frac{7}{3} > 1$)

(OR)

b) Construct a triangle PQR which the base PQ = 4.5cm, LR = 35° and the median RG from R to PQ is 6cm.

44) a) Graph the linear function $y = \frac{1}{2}x$. Identify the constant of variation and verify it with graph. Also (i) find y when x = 9, (ii) find x when y = 7.5

(OR)

b) Graph the quadratic equation $x2 - 6x + 9 = 0$ and state its nature of solutions.

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