RAVI MATHS TUITION CENTER, CHENNAI – 82. PH - 8056206308

10TH MATHS MODEL PAPER 4

Date : 29-Nov-19

10th Standard

Maths

Reg.No. : | | | | | | |

Exam Time : 03:00:00 Hrs

Total Marks : 100

ANSWER ALL

14 x 1 = 14

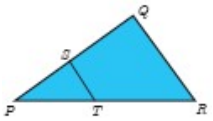
1) If f: A ⟶ B is a bijective function and if n(B) =8, then n(A) is equal to
(a) 7 (b) 49 (c) 1 (d) 14

2) 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

3) 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) $\frac{31}{2}$

4) If the roots of the equation $q^2x^2 + p^2x + r^2 = 0$ are the squares of the roots of the equation $qx^2 + px + r = 0$, then q, p, r are in _____.
(a) A.P (b) G.P (c) Both A.P and G.P (d) none of these

5) In a given figure ST||QR,PS=2cm and SQ=3 cm.
Then the ratio of the area of △ PQR to the area △ PST is



(a) 25 : 4 (b) 25 : 7 (c) 25 : 11 (d) 25 : 13

6) A tangent is perpendicular to the radius at the
(a) centre (b) point of contact (c) infinity (d) chord

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

8) Consider four straight lines
(i) l_1 : 3y = 4x + 5
(ii) l_2 : 4y = 3x - 1
(iii) l_3 : 4y + 3x =7
(iv) l_4 : 4x + 3y = 2
Which of the following statement is true?
(a) l_1 and l_2 are perpendicular (b) l_1 and l_4 are parallel (c) l_2 and l_4 are perpendicular (d) l_2 and l_3 are parallel

9) if $\sin\theta = \cos\theta$ =a and $\sec\theta + \operatorname{cosec}\theta$ =b, then the value of b (a^2-1) is equal to
(a) 2a (b) 3a (c) 0 (d) 2ab

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

11) The value of the expression $[\operatorname{cosec}(75^o+\theta) - \sec(15^o-\theta) - \tan(55^o+\theta) + \cot(35^o-\theta)]$ is
(a) -1 (b) 0 (c) 1 (d) $\frac{3}{2}$

12) The total surface area of a cylinder whose radius is $\frac{1}{3}$ of its height is
(a) $\frac{9\pi h^2}{8}$ sq.units (b) $24\pi\ h^2$ sq.units (c) $\frac{8\pi h^2}{9}$ sq.units (d) $\frac{56\pi h^2}{9}$ sq.units

13) If the standard deviation of x, y, z is p then the standard deviation of 3x+5, 3y+5, 3z +5 is
(a) 3p+5 (b) 3p (c) p + 5 (d) 9p + 15

14) A number x is chosen at random from -4, -3, -2, -1, 0, 1, 2, 3, 4 find the probability that $|x| \leq 4$

(a) 0 (b) 1 (c) $\frac{1}{2}$ (d) $\frac{1}{9}$

ANSWER ANY 10 QUESTIONS IN WHICH QUESTION NO. 28 IS COMPULSORY 12 x 2 = 20

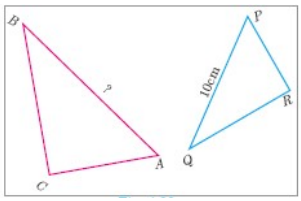
15) Find k if f o g(k) = 5 where f(k)=2k-1.

16) Compute x, such that $10^4 \equiv$ x (mod 19)

17) Find the sum of
$1^3+2^3+3^3+..+16^3$

18) If $A = \begin{bmatrix} 1 & -1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 \\ 2 & 1 \\ 1 & 3 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$ show that (AB)C = A(BC)

19) The perimeters of two similar triangles ABC and PQR are respectively 36 cm and 24 cm. If PQ =10 cm, find AB



20) Find the equation of a straight line passing through (5, - 3) and (7, - 4).

21) A line makes positive intercepts on coordinate axes whose sum is 7 and it passes through (-3,8). Find its equation

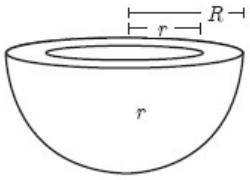
22) If A (-5, 7), B (-4, -5), C (-1, -6) and D (4, 5) are the vertices of a quadrilateral, find the area of the quadrilateral ABCD.

23) If $\frac{cos^2\theta}{sin\theta}$ =p and $\frac{sin^2\theta}{cos\theta}$,then prove that $p^2q^2(p^2+q^2+3)=1$

24) In a right triangle ABC, right-angled at B, if tan A = 1, then verify that 2 sin A cos A = 1.

25) A ladder 15 metres long just reaches the top of a vertical wall. If the ladder makes an angle of 60^o with the wall, finf the height of the wall.

26) The internal and external radii of a hollow hemispherical shell are 3 m and 5 m respectively. Find the T.S.A. and C.S.A. of the shell.



27) Find the standard deviation of the data 2, 3, 5, 7, 8. Multiply each data by 4. Find the standard deviation of the new values.

28) Find the standard deviation of 30, 80, 60, 70, 20, 40, 50 using the direct method.

ANSWER ANY 10 QUESTIONS IN WHICH QUESTION NO. 42 IS COMPULSORY 10 x 5 = 50

29) Let f be a function f:N $\longrightarrow$ N be defined by $f(x) = 3x+2x \in N$

(i) Find the images of 1, 2, 3

(ii) Find the pre-images of 29, 53

(ii) Identify the type of function

30) In an A.P. the sum of first n terms is $\frac{5n^2}{2} + \frac{3n}{2}$. Find the 17^{th} term

31) Find the rational form of the number 0.6666....

32) A pole 5 m high is fixed on the top of a tower. The angle of elevation of the top of the pole observed from a point 'A' on the ground is 60° and the angle of depression to the point 'A' from the top of the tower is 45°. Find the height of the tower. ($\sqrt{3}$ =1.732)

33) The volume of a solid hemisphere is 29106 cm^3. Another hemisphere whose volume is two-third of the above is carved out. Find the radius of the new hemisphere.

34) A card is drawn from a pack of 52 cards. Find the probability of getting a king or a heart or a red card.

35) a) Draw a triangle ABC of base BC = 8 cm, $\angle$ A=60° and the bisector of $\angle$ A meets BC at D such that BD = 6 cm.

(OR)

b) BL and CM are medians of a triangle ABC right angled at A.
Prove that $4(BL^2 + CM^2) = 5BC^2$.

36) a) Draw the graph of $y = x^2 - 4x + 3$ and use it to solve $x^2 - 6x + 9 = 0$

(OR)

b) $P.T\left(\frac{1+tan^2A}{1+cot^2A}\right) = \left(\frac{1-tan\quad A}{1-cot\quad A}\right)^2 = tan^2A$

37) Let A = {1,2,3,7} and B = {3,0,–1,7}, which of the following are relation from A to B ?
(i) R_1 = {(2,1), (7,1)}
(ii) R_2= {(–1,1)}
(iii) R_3 = {(2,–1), (7,7), (1,3)}
(iv) R_4= {(7,–1), (0,3), (3,3), (0,7)

38) If $f(x)=\frac{x-1}{x+1}$, $x\neq1$ show that $f(f(x)) = -\frac{1}{x}$, provided $x\neq0$.

39) The ratio of 6^{th} and 8^{th} term of an A.P is 7:9 Find the ratio of 9th term to 13^{th} term

40) How many terms of the series $1^3+2^3+3^3+$....Should be taken to get the sum 14400?

41) Simplify $\frac{\frac{1}{p}+\frac{1}{q+r}}{\frac{1}{p}-\frac{1}{q+r}} \times \left(1 + \frac{q^2+r^2-p^2}{2qr}\right)$

42) Given $A = \begin{pmatrix} p & 0 \\ 0 & 2 \end{pmatrix}$, $B = \begin{pmatrix} 0 & -q \\ 1 & 0 \end{pmatrix}$, $C = \begin{pmatrix} 2 & -2 \\ 2 & 2 \end{pmatrix}$ and if $BA = C^2$, find p and q.

43) If the roots of the equation $(c^2 - ab)x^2 - 2(a^2 - bc)x + b^2 - 4ac = 0$ are real and equal prove that either a = 0 (or) $a^3 + b^3 + c^3 = 3abc$.

44) Find the square root of the following polynomials by division method
$37x^2 - 28x^3 + 4x^4 + 42x + 9$

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