RAVI MATHS TUITION CENTER ,GKM COLONY, CH- 82. PH: 8056206308

10th MATHS MODEL PAPER 2

10th Standard

Maths

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

Instructions : (1) check the question paper for fairness of printing. if there is any lack of fairness, inform the hall supervisor immediately.(2) use blue or black ink to write and underline and pencil to draw diagrams

Exam Time : 03:00:00 Hrs Total Marks : 90

PART – I 14 x 1 = 14

ANSWER ALL THE QUESTIONS.

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

2) If g={(1,1), (2,3), (3,5), (4,7)} is a function givrn by g(x)=αx+β then the values of α and β are
(a) (-1,2) (b) (2,-1) (c) (-1,-2) (d) (1,2)

3) Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are
(a) 0, 1, 8 (b) 1, 4, 8 (c) 0, 1, 3 (d) 0, 1, 3

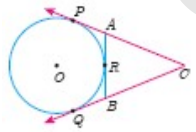
4) If the sequence t_1,t_2,t_3...are in A.P. then the sequence t_6,t_{12},t_{18},....is
(a) a Geometric Progression (b) an Arithmetic Progression (c) neither an Arithmetic Progression nor a Geometric Progression (d) a constant sequence

5) The solution of the system $x + y - 3x = -6, -7y + 7z = 7, 3z = 9$ is
(a) x = 1, y = 2, z = 3 (b) x = −1, y = 2, z = 3 (c) x = −1, y = −2, z = 3 (d) x = 1, y = 2, z = 3

6) Which of the following can be calculated from the given matrices $A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$,
(i) A^2
(ii) B^2
(iii) AB
(iv) BA
(a) (i) and (ii) only (b) (ii) and (iii) only (c) (ii) and (iv) only (d) all of these

7) In ∠ LMN, ∠ L=60°,∠ M=50°, If △ LMN~△ PQR then the value of ∠ R is
(a) 40° (b) 70° (c) 30° (d) 110°

8) In figure CP and CQ are tangents to a circle with centre at O. ARB is another tangent touching the circle at R. If CP=11 cm andBC =7 cm, then the length of BR is



(a) 6 cm (b) 5 cm (c) 8 cm (d) 4 cm

9) A man walks near a wall, such that the distance between him and the wall is 10 units. Consider the wall to be the Y axis. The path travelled by the man is
(a) x = 10 (b) y = 10 (c) x = 0 (d) y = 0

10) When proving that a quadrilateral is a parallelogram 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

11) $\tan\theta \operatorname{cosec}^2\theta - \tan\theta$ is equal to

(a) $\sec\theta$ (b) $\cot^2\theta$ (c) $\sin\theta$ (d) $\cot\theta$

12) If two solid hemispheres of same base radius r units are joined together along their bases, then curved surface area of this new solid is

(a) $4\pi r^2$ sq.units (b) $6\pi r^2$ sq.units (c) $3\pi r^2$ sq.units (d) $8\pi r^2$ sq.units

13) The height and radius of the cone of which the frustum is a part are h_1 units and r_1 units respectively. Height of the frustum is h_2 units and radius of the smaller base is r_2 units. If $h_2 : h_1 = 1:2$ then $r_2:r_1$ is

(a) 1:3 (b) 1:2 (c) 2:1 (d) 3:1

14) The range of the data 8, 8, 8, 8, 8. . . 8 is

(a) 0 (b) 1 (c) 8 (d) 3

PART II 10 x 2 = 20

ANSWER ANY 10 QUESTIONS IN WHICH QUESTION NO. 28 IS COMPULSORY.

15) Let X={1,2,,4} and Y={2,4,6,8,10} and R={(1,2),(2,4),(3,6),(4,8)} Show that R is a function and find its domain, co-domain and range?

16) Find the HCF of 396, 504, 636.

17) Find the sum of

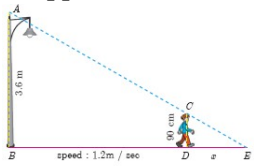
$1^2+2^2+...+19^2$

18) Solve $2x - 3y = 6$, $x + y = 1$

19) If α, β are the roots of the equation $3x^2 + 7x - 2 = 0$, find the values of

$\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$

20) A boy of height 90cm is walking away from the base of a lamp post at a speed of 1.2m/sec. If the lamppost is 3.6m above the ground, find the length of his shadow cast after 4 seconds.



21) Show that the points P(-1.5,3), Q(6,-2) , R(-3,4) are collinear.

22) prove that $\sec\theta - \cos\theta = \tan\theta \sin\theta$

23) 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.

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

25) The range of a set of data is 13.67 and the largest value is 70.08. Find the smallest value.

26) A bag contains 5 blue balls and 4 green balls. A ball is drawn at random from the bag. Find the probability that the ball drawn is (i) blue (ii) not blue.

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

28) If $A = \begin{bmatrix} 1 & 8 & 3 \\ 3 & 5 & 0 \\ 8 & 7 & 6 \end{bmatrix}$, $B = \begin{bmatrix} 8 & -6 & -4 \\ 2 & 11 & -3 \\ 0 & 1 & 5 \end{bmatrix}$, $C = \begin{bmatrix} 5 & 3 & 0 \\ -1 & -7 & 2 \\ 1 & 4 & 3 \end{bmatrix}$ compute the following

3A + 2B - C

PART III 10 X 5 = 50

ANSWER ANY 10 QUESTIONS IN WHICH QUESTION NO. 42 IS COMPULSORY.

29) Consider the functions f(x), g(x), h(x) as given below. Show that (f o g) o h = f o (g o h) in each case.
f(x)=x-1, g(x)=3x+1 and h(x) = x^2

30) A function f: [-5,9] ⟶ R is defined as follows:

$$f(x) = \begin{cases} 6x+1 & \text{if } -5 \le x < 2 \\ 5x^2 - 1 & \text{if } 2 \le x < 6 \\ 3x-4 & \text{if } 6 \le x \le 9 \end{cases}$$

Find $\frac{2f(-2)-f(6)}{f(4)+f(-2)}$.

31) Priya earned Rs.15,000 in the first month. Thereafter her salary increased by Rs1500 per year. Her expenses are Rs.13,000 during the first year and the expenses increases by Rs.900 per year. How long will it take for her to save Rs.20,000 per month

32) Find the sum to n terms of the series
0.4 +0.44+0.444+..to n terms

33) The number of seats in a row is equal to the total number of rows in a hall. The total number of seats in the hall will increase by 375 if the number of rows is doubled and the number of seats in each row is reduced by 5. Find the number of rows in the hall at the beginning.

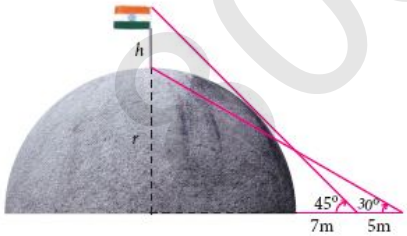
34) If A = $\frac{2x+1}{2x-1}$, B = $\frac{2x-1}{2x+1}$ find $\frac{1}{A-B} - \frac{2B}{A^2-B^2}$

35) Find the equation of a straight line passing through the point P(-5, 2) and parallel to the line joining the points Q(3, -2) and R(-5, 4).

36) Find the area of the quadrilateral whose vertices, taken in order, are (-4, -2), (-3, -5), (3, -2) and (2, 3).

37) prove the following identities.
$\frac{sinA-sinB}{cosA+cosB} + \frac{cosA-cosB}{sinA+sinB} = 0$

38) A flag pole 'h' metres is on the top of the hemispherical dome of radius 'r' metres. A man is standing 7 m away from the dome. Seeing the top of the pole at an angle
45° and moving 5 m away from the dome and seeing the bottom of the pole at an angle
30°. Find (i) the height of the pole (ii) radius of the dome ($\sqrt{3}$ =1.732)



39) A solid iron cylinder has total surface area of 1848 sq.m. Its curved surface area is five – sixth of its total surface area. Find the radius and height of the iron cylinder.

40) A right circular cylinder just enclose a sphere of radius r units. Calculate (i) the surface area of the sphere
(ii) the curved surface area of the cylinder
(iii) the ratio of the areas obtained in (i) and (ii).

41) Find the standard deviation of first 21 natural numbers.

42) Two unbiased dice are rolled once. Find the probability of getting
(i) a doublet (equal numbers on both dice)

(ii) the product as a prime number

(iii) the sum as a prime number

(iv) the sum as 1

43) a) Construct a triangle similar to a given triangle ABC with its sides equal to $\frac{6}{5}$ of thecorresponding sides of the triangle ABC (scale factor $\frac{6}{4}$).

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

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