MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

SAMPLE PAPER - 2

Part I

1. If there are 1024 relations from a set $A = \{1, 2, 3, 4, 5\}$ to a set B, then the number

of elements in B is

A. 3

B. 2

C. 4

D. 8

Answer:

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Part I Choose The Correct Answer Answer All The Questions

1. 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. $(1, 2)$

Answer:

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2. $7^{4k} =$ _ _ (mod 100)

A. 1

B. 2

C. 3

D. 4

Answer:

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3. The next term of the sequences $\dfrac{3}{16}, \dfrac{1}{8}, \dfrac{1}{12}, \dfrac{1}{18}, \cdots$

A. $\dfrac{1}{24}$

B. $\dfrac{1}{27}$

C. $\dfrac{2}{3}$

D. $\dfrac{1}{81}$

Answer:

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4. If (x-6) is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is.

A. 3

B. 5

C. 6

D. 8

Answer:

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5. Find the matrix X if

$$2X + \begin{bmatrix} 1 & 3 \\ 5 & 7 \end{bmatrix} = \begin{bmatrix} 5 & 7 \\ 9 & 5 \end{bmatrix} \ldots\ldots\ldots$$

A. $\begin{bmatrix} -2 & -2 \\ 2 & -1 \end{bmatrix}$

B. $\begin{bmatrix} 2 & 2 \\ 2 & -1 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 2 \\ 2 & 2 \end{bmatrix}$

D. $\begin{bmatrix} 2 & 1 \\ 2 & 2 \end{bmatrix}$

Answer: B

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6. The two tangents from an external points P to a circle with centre at O are PA and PB. If $\angle APB = 70°$ then the value of $\angle AOB$ is

A. $100°$

B. $110°$

C. $120°$

D. $130°$

Answer:

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7. The equatin of a line passing through the origin and perpendicular to the line $7x - 3y + 4 = 0$ is

A. $7x - 3y + 4 = 0$

B. $3x - 7y + 4 = 0$

C. $3x + 7y = 0$

D. $7x - 3y = 0$

Answer:

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8. If $x = a\tan\theta$ and $y = b\sec\theta$ then

A. $\dfrac{y^2}{b^2} - \dfrac{x^2}{a^2} = 1$

B. $\dfrac{x^2}{a^2} - \dfrac{y^2}{b^2} =$

C. $\dfrac{x^2}{a^2} - \dfrac{y^2}{b^2} = 0$

D. $\dfrac{y^2}{b^2} - \dfrac{x^2}{a^2} = 0$

Answer:

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9. Find the ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height ?

    A. $1:2:3$

    B. $2:1:3$

    C. $1:3:2$

    D. $3:1:2$

Answer:

10. The probability of getting a job for a person is $\dfrac{x}{3}$. If the probability of not getting the job is $\dfrac{2}{3}$ then the value of x is

A. 2

B. 1

C. 3

D. 1.5

Answer:

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11. Variance of the first 11 natural numbers is

....

A. $\sqrt{5}$

B. $\sqrt{10}$

C. $5\sqrt{2}$

D. 10

Answer:

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12. If α and β are the roots of the equation

$ax^2 + bx + c = 0$ then $(\alpha + \beta)^2$ is ....

A. $-\dfrac{b^2}{a^2}$

B. $\dfrac{c^2}{a^2}$

C. $\dfrac{b^2}{a^2}$

D. $\dfrac{bc}{a}$

Answer:

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13. If $k(x) = 3x - 9$ and $L(x) = 7x - 10$

then Lok is ....

    A. $21x + 73$

    B. $-21x + 73$

    C. $21x - 73$

    D. $22x - 73$

Answer:

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1. Let $A = \{1, 2, 3, 4. . ., 45\}$ and R be the relation defined as "is square of" on A. Write R as a subset of $A \times A$. Also, find the domain and range of R.

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2. If $f(x) = 3x - 2, g(x) = 2x + k$ and if fog=gof, then find the value of k.

3. Find the rational form of the number $\overline{0.123}$.

4. How many consecutive odd integers beginning with 5 will sum to 480?

5. Simplify $\dfrac{5t^3}{4t-8} \times \dfrac{6t-12}{10t}$

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6. Solve the following quadratic equations by factorization method.

$\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$

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7. Find the value of a, b, c, d from the equation

$$\begin{pmatrix} a-b & 2a+c \\ 2a-b & 3c+d \end{pmatrix} = \begin{pmatrix} 1 & 5 \\ 0 & 2 \end{pmatrix}$$

8. In $\triangle ABC$, D and E are points on the sides

AB and AC respectively such that $DE \mid\mid BC$

(i) If $\dfrac{AD}{DB} = \dfrac{3}{4}$ and AC=15 cm find AE.

(ii) If AD=8x-7, DB=5x-3, AE= 4x-3 and EC=3x - 1,

find the value of x.

9. The hill in the form of a right triangle has its foot at (19, 2). The inclination of the hill to the ground is $45°$. Find the equation of the hill joining the foot and top.

10. Prove that, $\sqrt{\dfrac{1 + \sin\theta}{1 - \sin\theta}} = \sec\theta + \tan\theta$

11. If the total surface area of a cone of radius 7cm is $704cm^2$, then find its slant height.

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12. The first term of an A.P is 6 and the common difference is 5. Find the A.P and its general term.

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13. If θ is an acute angle and $\tan\theta + \cot\theta = 2$ find the value of $\tan^7\theta + \cot^7\theta$

14. Cards marked with the numbers 2 to 101 are placed in a box and mixed throughly one card is drawn from this box. Find the probability that the number on the card is a number which is a perfect square.

1. Consider the function $f(x), g(x), h(x)$ as given below. Show that $(fog)oh = fo(goh)$ in each case.

$$f(x) = x^2, g(x) = 2x \text{ and } h(x) = x + 4$$

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2. If the function $f: R \to R$ is defined by

$$f(x) = \begin{cases} 2x + 7, x < -2 \\ x^2 - 2, -2 \le x < 3, \\ 3x - 2, x \ge 3 \end{cases} \quad \text{then} \quad \text{find}$$

the values of

(i) $f(4)$

(ii) $f(-2)$

(iii) $f(4) + 2f(1)$

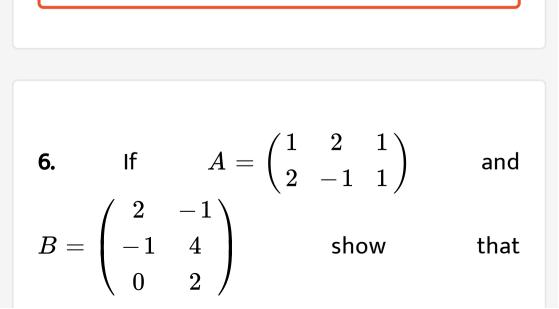(iv) $\dfrac{f(1) - 3f(4)}{f(-3)}$

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3. If (m+1)th term of an A.P. is twice the (n+1)th term, then prove that (3m+1)th term is twice the (m+n+1)th term

4. Find the sum to n terms of the series

$5 + 55 + 555 + \ ......$

5. Vani, her father and her grand father have an average age of 53. One-half of her grand father's age plus one-third of her father's age plus one fourth of Vani's age is 65. Four years ago if Vani's grandfather was four times as old as Vani then how old are they all now?

6. If $A = \begin{pmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{pmatrix}$ show that

$$(AB)^T = B^T A^T$$

7. Type V: O is the center of the circle of radius 5cm. T is a point such that OT=13cm and OT intersects the circle at E . If AB is the tangent to the circle at E; find the length of AB.

8. Find the area of the quadrilateral whose vertices are at

$$(- 9, 0), (- 8, 6), (- 1, -2) \text{ and } (- 6, - 3)$$

9. 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. $\left(\sqrt{3} = 1.732\right)$

10. A shuttle cock used for playing badminton has the shape of a frustum of a cone mounted on a hemisphere. The diameters of the ends of the frustum are 5 cm and 2 cm; the height of the entire shuttle cock is 7 cm. Find the external surface area.

11. The mean and variance of seven observations are 8 and 16 respectively. If five of these are 2,4,10,12,14, find the remaining two observations.

12. From a solid right circular cylinder with height 10 cm and radius of the base 6 cm, a right circular cone of the same height and

base is removed. Find the volume of the remaining solid. (Take $\pi = 3.14$)

13. If α and β are the roots of the equation $3x^2 - 6x + 1 = 0$ form the equation whose roots are $2\alpha + \beta$ and $2\beta + \alpha$

14. What is the probability that the sum of the numbers on the two faces is divisible by 3 or 4?

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Part Iv Answer All The Questions

1. (a) Draw the two tangents from a point which is 10 cm away from the centre of a circle of radius 5 cm. Also, measure the lengths of

the tangents.

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

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2. (a) Draw the graph of $y = x^2$ and hence solve $x^2 - 4x - 5 = 0$.

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

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