MATHS

BOOKS - OMEGA PUBLICATION

SAMPLE QUESTION PAPER -1 (PUNJAB)

Section A

1. A collection of most dangerous animals of the word is :

A. a null set

B. a finite set

C. a singleton set

D. Not a set

Answer:

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2. The range of $f(x) = \dfrac{x^2}{1 + x^2}$ is :

A. $[\, 0 \, , 1)$

B. $(0,1)$

C. $(1, \infty)$

D. $[1, \infty)$

Answer:

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3. The maximum value of $\sin\theta + \cos\theta$ is

A. 1

B. $\sqrt{2}$

C. 2

D. $-\sqrt{2}$

Answer:

4. the real part of $\dfrac{-1}{5} + \dfrac{i}{5}$ is :

A. zero

B. $1/5$

C. $-1/5$

D. None of these

Answer:

5. If $^nC_5 = {}^nC_{10}$ then n equals :

A. 5

B. 15

C. 10

D. None of these

Answer:

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6. If the third term of an A.P is 12 and the seventh term is 24, then the 10th term is:

    A. 30

    B. 33

    C. 36

    D. 39

Answer:

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7. Slope of the line joining (5,1) and (6,5) is :

A. 5

B. 6

C. 4

D. 2

Answer:

8. The centre of the circle

$x^2 + y^2 - 6x + 4y - 1 = 0$ is

A. $(-6, 4)$

B. $(4, \ -1)$

C. $(3, \ -2)$

D. $(-3, 2)$

Answer:

9. $\displaystyle\lim_{x \to 0} \dfrac{e^x - 1}{x}$ is :

A. 0

B. 1

C. -1

D. None of these

Answer:

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10. The probability of null event is :

A. 0

B. 1

C. $1/2$

D. None of these

Answer:

Section B

1. Prove that $\sin 51° + \cos 81° = \cos 21°$.

2. Prove that

$$\cos\left(\frac{\pi}{4} + x\right) + \cos\left(\frac{\pi}{4} - x\right) = \sqrt{2}\cos x$$

3. Prove that $i^n + i^{n+1} + i^{n+2} + i^{n+3} = 0$, for all $n \in N$.

4. If a and b are distinct integers, prove that a - b is a factor of $a^n - b^n$,whenever n is a positive integer.

5. Find the coefficient of x^{10} in the expansion of $\left(2x^2 - \dfrac{3}{x}\right)^{11}, x \neq 0$

6. Show that the points : A (0,1,2),B(2,-1,3) and C (1,-3,1) are vertices of an isosceles right angle triangle.

7. Write the negation of the following statement :

Both the diagonals of a Rhombus have the same length .

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8. Check in validity of the following statement :

Square of an integer is positive or negative .

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Section C

1. Prove that $A \cap B^C = A - B$.

2. Let R be relation on the set N of natural numbers defined by a +3b=12 . Find : (i) R (ii) domain of R (iii) Range of R

3. Find the degree measure of the angle subtended at the centre of a circle of radius 100 cm by an arc of length 22 cm (Use $\pi = \dfrac{22}{7}$).

4. Solven $\tan 2x = -\cot\left(x + \dfrac{\pi}{3}\right)$

5. Prove the following by using the principle of mathematical induction for all $n \in N$:-

$$1^2 + 3^2 + 5^2 + \ldots + (2n - 1)^2 = \dfrac{n(2n - 1)(2n + 1)}{3}$$

.

6. In how many of the distinct permutations of the letters in MISSISSIPPI do the four I's not come together?

7. In an A . P , if mth Term is n and nth term is m , where $m \neq n$, find the pth term .

8. If the pth , qth , rth , terms of a GP . Are x,y,z respectively prove that : $x^{q-r} . y^{r-p} . z^{p-q} = 1$

9. Find the equation of line perpendicular to x - 2y +3=0 and passing through the point (3,-2) .

10. Find the equation of the circle passing through the point (2,4) and has its centre at the intersection of x-y =4. and 2x +3y=-7.

11. Find the equation of the parabola whose focus is at the point (1,2) and directrix is x+2y+3=0.

12. Find the derivative of $f(x) = 1 + x + x^2 + x^3 \ldots \ldots + x^{50}$ at x=1.

13. A bag contain 5 Black and 3 white balls .Two balls are drawn at random .Find the probability of drawing

(i) 2 Black balls

(ii) 2 white balls .

Section D

1. If

$$(1+i)(1+2i)(1+3i)......(1+ni) = (x+iy) \ ,$$

then Show that : 2.5 .10 ...... $\left(1+n^2\right) = x^2 + y^2$

2. Solve the equation :

$$x^2 - (5 - i)x + (18 + i) = 0$$

3. A manufacture has 600 litres of a 12% solution of acid .How many litres of a 30% acid solution must be added to it so that acid content in the resulting mixture will be more than 15% but less than 18% ?

4. Verify that the solution set of the following is empty : $x - 2y \geq 0, 2x - y \leq -2, x \geq 0, y \geq 0$

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5. Use delta method of find the derivative of $\cot(2x + 1)$

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6. Evaluate $\lim\limits_{z \to 1} \dfrac{z^{1/3} - 1}{z^{1/6} - 1}$

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