MATHS

BOOKS - OMEGA PUBLICATION

SAMPLE QUESTIONS PAPER-4 (PUNJAB)

Secton A

1. Two finite sets have m and n elements. The number of subsets of the first set is 112 more than that of the second set. The values of m and are, respectively :

A. 4,7

B. 7,4

C. 4,4

D. 7,7

Answer:

▶ **Watch Video Solution**

---

2. Let $f(x) = [x]$, then $f\left(-\dfrac{3}{2}\right)$ is equal to :

A. -3

B. -2

C. -1.5

D. None of these

Answer:

3. The value of $\sin 10° \sin 50° \sin 70°$ is equal to

A. $\dfrac{1}{8}$

B. $\dfrac{1}{6}$

C. -1

D. $-\sqrt{2}$

Answer:

4. Additive inverse of complex number 4-7i is :

A. $4 + 7i$

B. $-4 + 7i$

C. $-4 - 7i$

D. None of these

Answer:

▶ **Watch Video Solution**

5. The number of straight lines that can be drawn out of

10 points of which 7 are collinear is :

A. 22

B. 23

C. 24

D. 25

Answer:

▶ **Watch Video Solution**

---

6. The sum of the first n odd number is :

A. $2n$

B. n^2

C. $\dfrac{n(n-1)}{2}$

D. $\dfrac{n(n+1)}{2}$

Answer:

7. The distance between the lines $3x + 4y = 9$ and $6x + 8y = 15$ is :

A. $\dfrac{3}{10}$

B. $\dfrac{7}{10}$

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

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

Answer:

8. The directrix of the parabola $y^2 + 4x + 3 = 0$ is :

A. $x = \dfrac{1}{4}$

B. $x + \dfrac{1}{4} = 0$

C. $x - \dfrac{4}{3} = 0$

D. $x - \dfrac{3}{4} = 0$

Answer:

▶ Watch Video Solution

9. The value of $\lim\limits_{x \to 0} \dfrac{\sin ax}{\sin bx}$ is :

A. $\dfrac{a}{b}$

B. $\dfrac{b}{a}$

C. 1

D. $-\dfrac{b}{a}$

Answer:

10. The probability that a non-leap year has 53 Sundays is

A. $\dfrac{2}{7}$

B. $\dfrac{3}{7}$

C. $\dfrac{2}{9}$

D. None of these

Answer:

▶ Watch Video Solution

Section B

1. If X and Y are two sets such that $n(X) = 17, n(Y) = 23$ and $n(X \cap Y) = 38,$ find $n(X \text{ or } Y)$.

▶ Watch Video Solution

2. Find the domain of the function $f(x) = \dfrac{x^2 + 3x + 5}{x^2 - 5x + 4}$

▶ Watch Video Solution

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 $\pi = \frac{22}{7}$).

4. For an positive integer n, prove that :

$$i^n + i^{n+1} + i^{n+2} + i^{n+3} + i^{n+4} + i^{n+5} + i^{n+6} + i^{n+7} = 0$$

.

5. A committees of 3 persons is to be constituted from a group of 2 men and 3 women. In how many ways can this be done ? How many of these committees would consist of 1 man and 2 women ?

6. The 4th term of a G.P. is square of its second term, and the first term is-3. Determine its 7th term.

7. Find the equation of the line perpendicular to the line $x - 7y + 5 = 0$ and having x-intercept 3.

8. Show that the points (-2, 3, 5), (I, 2, 3) and (7, 0, -I) are collinear (by vector method only).

Section C

1. There are 200 individuals with in skin disorder. 120 had been exposed to the chemical C_1, 50 to chemical C_2 and 30 to both the chemicals C_1 and C_2. Find the number of individuals exposed to :

Chemical C_1 but not chemical C_2

2. There are 200 individuals with in skin disorder. 120 had been exposed to the chemical C_1, 50 to chemical C_2 and 30 to both the chemicals C_1 and C_2. Find the number of individuals exposed to :

Chemical C_2 but not chemical C_1

3. There are 200 individuals with in skin disorder. 120 had been exposed to the chemical C_1, 50 to chemical C_2 and 30 to both the chemicals C_1 and C_2. Find the number of

individuals exposed to :

Chemical C_1 or chemical C_2.

4. Find the domain and range of the following functions :

$$f(x) = \sqrt{(x-1)(3-x)}.$$

5. If $A + B + C = \pi$, show that :

$$\tan\frac{A}{2}\tan\frac{B}{2} + \tan\frac{B}{2}\tan\frac{C}{2} + \tan\frac{C}{2}\tan\frac{A}{2} = 1.$$

6. If $\cos(\theta + 2\alpha) = m\cos\theta$, prove that :

$\cot\alpha = \dfrac{1+m}{1-m}\tan(\theta+\alpha).$

7. Using principle of mathematical induction, prove that

$$\dfrac{1}{1.2} + \dfrac{1}{2.3} + \dfrac{1}{3.4} + \cdots + \dfrac{1}{n(n+1)} = \dfrac{n}{n+1}$$

8. Find the square root of $-7 - 24$ i.

9. ਮੁੱਲ ਪਤਾ ਕਰੋ:- $\left(a^2 + \sqrt{a^2 - 1}\right)^4 + \left(a^2 - \sqrt{a^2 - 1}\right)^4$

▶ **Watch Video Solution**

10. The coefficients of three consecutive terms in the expansion of $(1 + a)^n$ are in the ratio $1 : 7 : 42$. Find n

▶ **Watch Video Solution**

11. Find the sum of the series $1 \cdot 2 \cdot 3 + 2 \cdot 3 \cdot 4 + 3 \cdot 4 \cdot 5 + \ldots$ upto n terms .

▶ **Watch Video Solution**

12. Find the equation of the line passing through the intersection of the lines $x + 2y - 3 = 0$ and $4x - y + 7 = 0$ and which is parallel to $5x - 4y - 20 = 0$.

13. Find the length of major and minor axes, the the co-ordinates of foci, the vertices of the ellipse $3x^2 + 2y^2 = 18$.

14. Find the co-ordinates of the foci, the vertices and length of latus-rectum of the hyperbola :

$$16x^2 - 9y^2 = 576.$$

▶ Watch Video Solution

15. Use delta method to find the derivates of the following

: cos 3x.

▶ Watch Video Solution

Section D

1.   If $x - iy = \sqrt{\dfrac{a - ib}{c - id}}$ prove   that $\left(x^2 + y^2\right)^2 = \dfrac{a^2 + b^2}{c^2 + d^2}.$

▶ Watch Video Solution

2. If z_1, z_2 are $1 - i, -2 + 4i$ respectively, find $I_m\left(\dfrac{z_1 z_2}{\overline{z_1}}\right)$.

▶ Watch Video Solution

3. Solve the following system of inequalities : $3x - 7 < 5 + x$ and $11 - 5x \le 1$ and represent the solution on number line.

▶ Watch Video Solution

4. In the first four examinations, each of 100 marks, Hamid got 94,73,72, 84 marks if the final average is greater than

or equal to 80 and less than 90 is needed to obtain a final B grade in a course, what range of marks in the fifth (last) examination will result in Hamid receiving 'B' in the course ?

5. Use delta method to find the derivates of the following :

sin 2x.

6. If $y = 1 + \dfrac{x}{1!} + \dfrac{x^2}{2!} + \dfrac{x^3}{3!} + \ldots + \dfrac{x^n}{n!}$, prove that $\dfrac{dy}{dx} + \dfrac{x^n}{n!} = y$

7. The mean and variance of 8 observation are 9 and 9.25 respectively. If six of the observations are 6, 7, 10, 12, 12 and 13, find the remaining two observations.