# MATHS

# BOOKS - OMEGA PUBLICATION

# SAMPLE QUESTIONS PAPER - 5 (PUNJAB)

## Section A

**1.** The set $\phi$ is

A. $\phi$

B. U

C. U'

D. None of these

**Answer:**

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**2.** The domain of $f(x) = \frac{1}{\sqrt{1-x^2}}$ is :

A. $\{x \mid x \in R, \ -1 \leq x \leq 1\}$

B. $\{x \mid x \in R, \ -1 < x < 1\}$

C. $\{x \mid x \in R, \ -1 \geq x \geq 1\}$

D. $\{x \mid x \in R, \ -1\{1, \ -1\}\}$

**Answer:**

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**3.** Radian measures of $520^\circ$ is :

A. $\frac{26\pi}{9}$

B. $\frac{26}{9}$

C. $\frac{26}{9\pi}$

D. None of these

**Answer:**

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**4.** Solve $x^2 + 3 = 0$

A. $-3$

B. $-\sqrt{3}$

C. $\pm\sqrt{3}i$

D. None of these

**Answer:**

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**5.** $7! - 5!$ is :

A. $7!$

B. $2!$

C. 42

D. None of these

**Answer:**

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**6.** Sum of the series $1^2 + 3^2 + 5^2 + \ldots + n^2$ is :

A. $\frac{n}{3}\left(4n^2 - 1\right)$

B. $\frac{n}{3}\left(4n^2 - n\right)$

C. $\frac{n}{3}\left(4n^2 + 1\right)$

D. $\frac{n}{3}\left(4n^2+n\right)$

**Answer:**

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**7.** Find the incentre of the triangle with vertices $A\left(1,\sqrt{3}\right)$, $B(0,0)$ and $C(2,0)$.

A. $\left(1,\frac{\sqrt{3}}{2}\right)$

B. $\left(\frac{2}{3},\frac{1}{\sqrt{3}}\right)$

C. $\left(\frac{2}{3},\frac{\sqrt{3}}{2}\right)$

D. $\left(1,\frac{1}{\sqrt{3}}\right)$

**Answer:**

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**8.** The focus of the parabola $y = 2x^2 + x$ is

A. (0, 0)

B. $\left(\frac{1}{2}, \frac{1}{4}\right)$

C. $\left(-\frac{1}{4}, 0\right)$

D. None of these

**Answer:**

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**9.** $\lim_{x \to 0} \frac{e^{3x} - 1}{x}$ is :

A. $-3$

B. $\frac{1}{3}$

C. 3

D. $\infty$

**Answer:**

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**10.** From a bag containing 2 white and 6 green balls, a ball is drawn at random. The probability of not a green

ball is :

A. 1

B. $\frac{3}{4}$

C. $\frac{1}{3}$

D. $\frac{1}{4}$

**Answer:**

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## Section B

**1.** Prove that $\frac{\sin(x+y)}{\sin(x-y)} = \frac{\tan x + \tan y}{\tan x - \tan y}$

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**2.** Solve $\sin 3\theta + \cos 2\theta = 0.$

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**3.** Find the modulus of $\frac{1+i}{1-i} - \frac{1-i}{1+i}$.

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**4.** Use Binomial Theorem to indicate which is larger ? $(1.2)^{4000}$ or 800.

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**5.** Find 'a' if the coefficients of $x^2$ and $x^3$ in the expanion of $(3+ax)^9$ are equal.

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**6.** Three vertices of parallelogram ABCD are A(3,-1,2), B(1,2,-4), C(-1,1,2). Find the co-ordinate of the fourth vertex.

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**7.** Write the contrapositive and coverse of the following :

IF x is a prime number, then x is odd.

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**8.** Find the component statements of the following and check whether it is true or not. "24 is a multiple of 2, 4 and 8".

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## Section C

**1.** A market research group conducted a survey of 1000 consumers and reported that 720. consumers liked product A and 450 liked product B. What is the least number that must have like both products ?

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**2.** The function 't', which maps temperature in Clesius into temperature Fahrenheit is defined by $t(C) = \frac{9C}{5} + 32$. Find : (i) t(0) (ii) t(28) (iii) t(-10) (iv) the value of c when t (c ) = 212.

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

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**4.** Prove that $\tan A + \cot A = 2\text{cosec } 2\text{A}.$

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

$1.2 + 2.3 + 3.4 + \ldots + n.\,(n+1) = \left[\frac{n(n+1)(n+2)}{3}\right.$

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**6.** Find n if ${}^{n-1}P_3 : {}^{n}P_4 = 1:16.$

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

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**8.** The 4th term of a G.P. is square of second term and first term is -3. Determine its 6th term.

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**9.** 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.

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**10.** Find the co-ordinates of the focus, axis, the equation of the directrix and length of latus-rectum of the parabola $x^2 = -16y$.

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**11.** Evaluate : $\lim_{x \to 0} \frac{\sin 5x}{\tan 3x}$.

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**12.** Tickets are numbered from 1 to 100. One ticket is picked up at random. Find the probability that the ticket picked up has a number, which is divisible by 5 or 8.

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**13.** If $|z_1| = |z_2| = \ldots . |z_n| = 1$, prove that $|z_1 + z_2 + \ldots \ldots . z_n| = \left| \frac{1}{z_1} + \frac{1}{z_2} + \ldots \ldots \ldots + \frac{1}{z_n} \right|$

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**14.** Express $1 + i\sqrt{3}$ in polar form.

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**15.** 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 $18\%$ ?

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**16.** Solve $-2-\frac{x}{4} \leq \frac{1+x}{3}, 3-x<4(x-3)$.

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**17.** Use delta method to find the derivative of x sin x.

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**18.** Find the maximum value of sin x cos x.

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**19.** 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.

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