# O.P. JINDAL SCHOOL, SAVITRI NAGAR

**Periodic Test-1 (Round 2) 2025-206**

**Class: XI Sci.** **MM:20**

**Subject: Mathematics** **Time :1Hour**

***General Instructions:***

***i) All questions are compulsory.***
***ii) Question no. 1 to 8 carries 1 mark each, question no. 9 to 11 carries 2 marks each, question no. 12 and 13 carries 3 marks each.***
***iii) There is no overall choice. However, internal choice has been provided.***

## SECTION A

**1.)** Let n(A) = m and n(B) = n. Then the total number of non empty relations that can be defined from A to B is
a) $m^n$ b) $n^m - 1$ c) mn - 1 d) $2^{mn} - 1$

**2.)** Domain of $\frac{x^2+2x+1}{x^2-8x+12}$ is
a) R b) R – [2, 6] c) R – {2, 3} d) {2, 3}

**3.)** Let A = {a, b, c} and B = {p, q, r} then which of the following is the function from A to B ?
a) {(a, p), (b, q), (b, r)} b) {(a, p), (b, q), (c, r)} c) {(a, q), (b, q), (a, r)} d){(a, p), (a, q), (a, r)}

**4.) 5.** The value of $\sin 75^0$ is equal to
a) $\frac{\sqrt{3}+1}{\sqrt{3}-1}$ b) $\frac{\sqrt{3}-1}{\sqrt{3}+1}$ c) $\frac{\sqrt{3}-1}{2\sqrt{2}}$ d) $\frac{\sqrt{3}+1}{2\sqrt{2}}$

**5.)** The range of signum function is
a) [-1, 1] b) $[0, \infty)$ c) {-1, 0, 1} d) [-1, 0]

**6.)** $\sin 36^0 \cos 9^0 + \cos 36^0 \sin 9^0 = ?$
a) $\frac{1}{\sqrt{2}}$ b) $\frac{1}{2}$ c) $\frac{\sqrt{3}}{2}$ d) 1

**7.)** In a circle of radius 10cm , an arc of length 5cm subtend an angle of
a) π radian b) $\frac{\pi}{2}$ radian c) $\frac{1}{2}$ radian d) 1 radian

**8.)** Radian measure of $105^0$ is equal to
a) $\frac{2\pi}{3}$ b) $\frac{7\pi}{12}$ c) $\frac{\pi}{3}$ d) $\frac{3\pi}{8}$

## SECTION B

**9.)** Prove that $\frac{\sin 7\theta - \sin 5\theta}{\cos 7\theta + \cos 5\theta} = \tan\theta.$

**10.)** Find the value of $\sin 22.5^0$ .

**OR**

Prove that $\cos^2 x - \cos^2 6x = \sin 4x \sin 8x$ .

**11.)** If A = {x : $x^2 - 5x + 6 = 0$}, B = {2, 4}, C = {4, 5}, then find the value of $A \times (B \cap C)$.

## SECTION C

**12.)** Prove that $\sin 20^0 \sin 40^0 \sin 60^0 \sin 80^0 = \frac{3}{16}$.

**OR**

Prove that $(\cos x - \cos y)^2 - (\sin x - \sin y)^2 = 4\cos^2 \frac{x+y}{2}$.

**13.)** Find the domain and range of the function $\sqrt{9-x^2}$ .

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