

Comprehensive Test Series-01
Chapter II – VI

TIME: 2.00 hr.

MM: 60

General Instructions:

- All Questions are compulsory.
 - Marks are given along with the questions individually.
 - Use of calculator is not permitted.
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Q.1 Evaluate $\left[i^{17} - \left(\frac{1}{i} \right)^{34} \right]^2$

Q.2 Convert the complex number $z = \frac{i-1}{\cos \frac{\pi}{3} + i \sin \frac{\pi}{3}}$ in the polar form.

Q.3 Convert in the polar form $\frac{1+7i}{(2-i)^2}$

Q.4 If $(x + iy)^{1/3} = a + ib$, prove that $\frac{x}{a} + \frac{y}{b} = 4(a^2 - b^2)$

Q.5 $a + ib = \sqrt{\frac{1+i}{1-i}}$ show that $a^2 + b^2 = 0$

Q.6 If α and β are different complex number with $|\beta| = 1$, then find $\left| \frac{\beta - \alpha}{1 - \bar{\alpha}\beta} \right|$

Q.7 Find the value of $\tan \frac{13\pi}{12}$

Prove the following

Q.8 $3 \sin \frac{\pi}{6} \sec \frac{\pi}{3} - 4 \sin \frac{5\pi}{6} + \cot \frac{\pi}{4} = 1$

Q.9 $\frac{\sin(x+y)}{\sin(x-y)} = \frac{\tan x + \tan y}{\tan x - \tan y}$

Q.10 $\frac{\cos 4x + \cos 3x + \cos 2x}{\sin 4x + \sin 3x + \sin 2x} = \cot 3x$

Q.11 $2 \cos \frac{\pi}{13} \cos \frac{9\pi}{13} + \cos \frac{3\pi}{13} + \cos \frac{5\pi}{13} = 0$

Q.12 $(\cos x + \cos y)^2 + (\sin x - \sin y)^2 = 4 \cos^2 \frac{x+y}{2}$

Q.13 $\tan 4x = \frac{4 \tan x(1 - \tan^2 x)}{1 - 6 \tan^2 x + \tan^4 x}$

Q.14 $\cos 6x = 32 \cos^6 x - 48 \cos^4 x + 18 \cos^2 x - 1$

Q.15 Solve $\tan 2x = -\cot \left(x + \frac{\pi}{3}\right)$

Q.16 Find the value of $\tan \frac{\pi}{8}$

Q.17 Find $\sin \frac{x}{2}$, $\cos \frac{x}{2}$, $\tan \frac{x}{2}$

If $\tan x = -\frac{4}{3}$, x in quadrant II

Q.18 If $P = \{1, 2\}$, form the set $P \times P \times P$

Q.19 $10^{2n-1} + 1$ is divisible by 11.

Q.20 $x + 2y \leq 10$, $x + y \geq 1$, $x - y \leq 0$, $x \geq 0$, $y \geq 0$ solve graphically.