CLASS11 | THE VILLAGE INTERNATIONAL SCHOOL "We Nurture Dreams" | Max.Marks: 20

07-11-24 | MATHEMATICS (041) – MT2 | Time: 50 minutes

General Instructions:
1) Questions 1 to 4 carries 1 mark each.
2) Questions 5 to 8 carries 2 marks each.
3) Questions 9 and 10 carries 4 marks each.

	SECTION A	
1.	If in a G.P, $a_3 + a_5 = 90$ and r=2, find first term of the G.P (a) 9/ 2 (b) 1/3 (c) 2/9 (d) 1/2	1
2.	Find the radian measure of -37°30′ (a) $5\pi/24$ radian (b) - $5\pi/24$ radian (c) $\pi/24$ radian (d) -$\pi/24$ radian	1
3.	Find the value of sin (-1125)° (a) -1/2 (b) 1/2 (c) -1/√2 (d) 1/√2	1
4.	Which of the following is not equal to $cos\,2x$ (a) $cos^2x - sin^2x$ $b)\ 1 - 2sin^2x$ (b) $1 - 2cos^2x$ d) $\frac{1-tan^2x}{1+tan^2x}$	1
	SECTION B	
5.	Prove that $\frac{Sin\ 5x-2\ Sin\ 3x+Sin\ x}{Cos\ 5x-Cos\ x}$ = tan x **OR** Prove that:sin x + sin 3x +sin 5x + sin 7x=4sin 4x cos2x cos x	2
6.	The sum of first three terms of a G.P is 39/10 and their product is 1. Find the common ratio and the terms.	2
7.	Find the sum of n terms of the following series 7+77+777+7777+…………….. OR If the first and nth term of a G.P are a and b respectively, and if P is the product of n terms, prove that $P^2 = (ab)^n$.	2
8.	Prove that: $\tan 2024x - \tan 2023x - \tan x = \tan 2024x \,.\, \tan 2023x \,.\, \tan x$	2
	SECTION C	
9.	Prove that $\cos^2x + \cos^2(x+\frac{\pi}{3}) + \cos^2(x-\frac{\pi}{3}) = \frac{3}{2}$	4

	OR 1f tanx = ¾ and $\pi < x < \frac{3\pi}{2}$, find the values of sin$\frac{x}{2}$, cos$\frac{x}{2}$ and tan$\frac{x}{2}$	
10.	Let S be the sum, P the product and R the sum of reciprocals of n terms in a G.P. Prove that $P^2R^n = S^n$ OR If a and b are the roots of $x^2 - 3x + p = 0$ and c, d are roots of $x^2 - 12x + q = 0$, where a, b, c, d form a G.P. Prove that $(q + p) : (q - p) = 17:15$.	4