



Graphic Era
HILL UNIVERSITY
Established by an Act of the State Legislature of Uttarakhand (Adhiniyam Sankhya 12 of 2011)
University under section 2(f) of UGC Act, 1956

Term Evaluation (Odd) Semester Examination September 2025

Roll no.....

Name of the Course: Diploma in Engineering

Semester: I

Name of the Paper: Applied Mathematics-I

Paper Code: DTMA-101

Time: 1.5 hours

Maximum Marks: 50

Note:

- (i) Answer all the questions by choosing any one of the sub-questions.
- (ii) Each question carries 10 marks.

Q1.

(CO1) (10 Marks)

a. Change the rational function form into a partial fraction form $\frac{3x+1}{(x-1)^2(x+2)}$.

OR

b. Find the 12th term of the Arithmetic Progression (AP): 2, 7, 12.... and also, find the sum of its first seven terms.

Q2.

(CO1) (10 Marks)

a.

- i. How many 10-digit numbers can be formed from the digits 1, 2, 3, 4, 5, 6 if the digits can be repeated?
- ii. If ${}^nC_9 = {}^nC_8$ find ${}^nC_{17}$.

OR

b. The fourth term of a Geometric Progression G.P. is 9 and its tenth term is 6561. Find the sum of its first six terms. Also, find the series.

Q3.

(CO1) (10 Marks)

a. i. Expand $\left(x^2 + \frac{3}{x}\right)^2, x \neq 0$ ii. Compute $(99)^4$

OR

b. State & prove Binomial theorem for positive integral index.

Q4.

(CO2) (10 Marks)

a. Define the Sine formula, Cosine formula, and Tangent formula.

OR

b. If in a triangle ABC, given $a=8$, $b=5$ and $c=8$, then find value of $\cos \frac{A}{2}$ and find angle A.

Q5.

(CO2) (10 Marks)

a. Evaluate: i^9 , $(i-1)^3$ and $(\sqrt{1})^{90}$.

OR

b. Define De-Moivre's theorem for the set of positive and negative integers.