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 Engineering
Semester: - I
Name of the Paper: Applied Physics - I
Paper Code: DTPH 102
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. (10 Marks)

a. Give the dimensional formula of the following physical quantities
(i) Acceleration = _____.
(ii) Force = _____.
(iii) Surface Tension= _____.
(iv) Energy = _____.
(v) Volume = _____. **[CO1]**

OR

b. Define the Principle of Homogeneity. Check the correctness of the formula,

$$\frac{1}{2}mv^2 = mgh$$

where m is the mass, v is the velocity, g is the acceleration due to gravity and h is the height. **[CO1]**

Q2. (10 Marks)

a. Differentiate between scalar and vector quantities with examples. Define the triangle law of vector addition and state the formula of the resultant $\vec{R}$. **[CO1]**

OR

b. If $\vec{A} = 2\hat{\imath} - 3\hat{\jmath} + 4\hat{k}$ and $\vec{B} = 2\hat{\imath} + 2\hat{\jmath} + 3\hat{k}$, find unit vector along $(\vec{A} + \vec{B})$. **[CO1]**

Q3. (10 Marks)

a. A body of mass m = 0.20 kg is revolved in a horizontal circle of diameter 1.2 m on a frictionless plane using a string. It performs 15 revolutions in 20.0 s. Find the centripetal force. **[CO2]**

OR

b. What is force? Explain the concept of contact and non-contact forces with examples. Write the statement of Newton's first law of motion. **[CO2]**

Q4.

a. Solve the following questions. (10 Marks)
(i) If $\vec{A} = 3\hat{\imath} - 5\hat{\jmath} + 2\hat{k}$ and $\vec{B} = 2\hat{\imath} + 3\hat{\jmath} + 3\hat{k}$, find $(\vec{A} \cdot \vec{B})$.
(ii) If $\vec{A} = 2\hat{\imath} - 3\hat{\jmath} + 2\hat{k}$ and $\vec{B} = 3\hat{\imath} + 4\hat{\jmath} + 5\hat{k}$, find $(\vec{A} \times \vec{B})$. **[CO1]**

OR

b. Define uniform circular motion. Explain angular displacement and angular velocity and state their formula. **[CO2]**

Q5. (10 Marks)

a. Describe Newton's third law of motion. Give real-life examples of the law. Discuss the law of conservation of linear momentum with examples. **[CO2]**

OR

b. Derive the relation between linear velocity and angular velocity for a particle moving in a circular path. **[CO2]**