UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program : First Semester – Fall 2021

Roll No. .....

Paper: Fundamental Applications of Physics (General 1)

Course Code: PHY-115 **Time: 3 Hrs.** **Marks: 60**

Q.1. Give short answers of the following. **(15x2=30)**

i. What is the difference between speed and displacement?

ii. Distinguish between steady and non- steady fluid flow.

iii. State Torricelli's theorem.

iv. What do you mean by instantaneous power? Also define horsepower.

v. The resultant of two vectors of magnitude 3units and 4 units is $\sqrt{37}$. Calculate the angle between two vectors.

vi. Calculate the gravitational force between two bodies each of mass 1kg and separated by a unit distance

vii. Define term "component of a vector"

viii. State second condition of equilibrium

ix. How force and momentum are related to each other? State newton's second law in terms of momentum

x. Define conservative field. Give at least one example of conservative field

xi. State work energy principle

xii. Write down the relationship between linear displacement and angular displacement

xiii. Compare centripetal force and centrifugal force

xiv. State Stoke's law. What are its limitations?

xv. Define terminal velocity

Answers the following questions. **(3x10=30)**

Q.2. **(a)** Define absolute potential energy. Derive relation for absolute potential energy of body of mass 'm' at distance 'r' from the center of earth. **(6 Marks)**

(b) Define and explain moment of inertia? **(4 Marks)**

Q.3. **(a)** State and explain equation of continuity **(6 Marks)**

(b) A 57kg woman runs up a flight of stairs having a rise of 4.5m in 3.5s. what is the average power must she supply? **(4 Marks)**

Q.4. **(a)** Discuss interconversion of potential energy and kinetic energy **(6 Marks)**

(b) Derive the relationship between linear and angular acceleration **(4 Marks)**