School of University Polytechnic

Diploma in Civil Engineering
Summer Term Examination - Jul / Aug 2024

Duration : 180 Minutes
Max Marks : 100

Sem I - N1DF104B - Applied Physics-I

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1)	The density of wood is 0.5g/cc. What is its value in SI system?	K1(2)
2)	Find the torque of a force $(7\hat{i} + 3\hat{j} - 5\hat{k})$ about the origin. The force acts on a particle whose position vector is $(\hat{i} - \hat{j} + \hat{k})$.	K2(4)
3)	A particle of mass 3 kg moves under o force of $(4i + 8j + 10k)$ newton. Calculate the acceleration (as vector) to which the particle is subjected.	K2(6)
4)	Illustrate and explain Newton's second law of motion. A force of 0.6 N on particle increases its velocity from 5.0m/s to 6.0m/s in 2 second. Find the mass of the particle.	K3(9)
5)	State and explain the principle of conservation of angular momentum. Give at least two examples.	K3(9)
6)	State and explain the Kepler's laws of planetary motion.	K5(10)
7)	Compare Centrifugal force and centripetal force. Illustrate why a Cyclist bends a little from their vertical axis when made turn?	K4(12)
8)	If E, m, I and G denote energy, mass, angular momentum and gravitational constant respectively, then find the dimensions of $EI2/m5G2$	K5(15)
9)	Interpret Carnot Cycle and explain in details the steps involved in a Carnot Cycle	K5(15)
10)	Pressure (P) of a liquid filled in tank depends upon height of column (h), density of the liquid (ρ) and acceleration due to gravity (g). Derive a formula for pressure by using the method of dimensions.	K6(18)