TED (15/19) 1003
(Revision – 2015/19)

A22 – 07049

Reg. No……
Signature …….

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2022

ENGINEERING PHYSICS - I

[Maximum Marks: **100**] [Time: **3** Hours]

(PART-A)

(Answer ***all*** the questions in one or two sentences. Each question carries ***2*** marks)

I. 1. Write down the SI unit of Temperature and Luminous intensity.
2. State triangle law of vector addition.
3. Define the terms stress and strain.
4. State Newton's first law of motion.
5. Define node and antinode. (5 x 2 = 10)

(PART-B)

(Answer any ***five*** of the following questions. Each question carries ***6*** marks)

II. 1. State Newton's third law of motion. Deduce the law of conservation of momentum using Newton's laws of motion.
2. Explain the terms resolution of a vector. What is rectangular resolution? A force of 30 N makes an angle 60 with horizontal. Find its horizontal and vertical components.
3. Define impulse. Show that it is equal to the change in momentum.
4. State and Explain Lami's theorem.
5. Define wavelength, frequency and velocity of wave. Derive the relation between them.
6. State Bernoulli's principle. Explain the working of atomizer.
7. Distinguish between free vibration and forced vibration. What is resonance? When does it happen? (5 x 6 = 30)

(PART-C)

(Answer ***one*** full question from each Unit. Each full question carries ***15*** marks)

UNIT – I

III. (a) Define speed velocity and acceleration. (3)

(b) Obtain an expression for distance travelled by a particle during the n^{th} second of its motion. (6)

(c) A body travels 30m in 5th second and 80 m in 7th second of its motion. Find the distance travelled in the 9th second of its motion. (6)

OR

IV. (a) Define fundamental quantity and derived quantity. Give examples. (3)

(b) Give any four advantages of SI system over other unit systems. Give units for velocity and acceleration. (6)

(c) State Newton's second law. Derive an expression for force from it. (6)

UNIT – II

V. (a) State parallelogram law of vector addition. Find out the magnitude of resultant of two forces p and Q acting at angle θ. (6)

(b) Define parallel forces. State the conditions of equilibrium of a body under the action of coplanar forces. (3)

(c) A force of 4N acts along the direction another force 5N makes an angle 60^0 with the first force. Find the magnitude and direction of resultant. (6)

OR

VI. (a) Define couple. Derive an expression for work done by a couple. (6)

(b) A couple 100 Nm acts on the shaft of a motor and rotates it at a speed of 7 rev/s. calculate the power developed. (6)

(c) Define the terms resultant and equilibrant. (3)

UNIT- III

VII. (a) Using Stoke's law obtain an expression for the terminal velocity of a sphere falling through a viscous liquid. (6)

(b) Explain different types of energy associated with fluid flow. (3)

(c) Find the terminal velocity of a rain drop of radius 0.3mm coefficient of viscosity of air 1.83×10^{-5} SI unit. Density of air is $1.3 Kg/m^3$. Density of water is $1000 kg/m^3$. (6)

OR

VIII. (a) Explain three types of modullii of elasticity. (3)

(b) Write the equation of continuity for steady flow of an incompressible fluid. The radius of a pipe decreases from 3 cm to 2 cm. if the velocity of a water in the wider portion is 2 m/s. calculate the velocity in the narrow path. (6)

(c) Give Poiseceille's formula. Describe Poiseceille's method to determine the coefficient of viscosity of water. (6)

UNIT - IV

IX. (a) Define simple harmonic motion, write its differential equation. (3)

(b) What are ultrasonic waves describe a method to procedure ultra sonic waves. (6)

(c) The shortest length of air column contained in a pope open at both ends resonating with a tuning form of frequency 384 Hz is 46 cm. calculate the velocity of sound. (6)

OR

X. (a) Write a note on nodes and antinodes. (3)

(b) Show that an open pipe produce all harmonics. Illustrate your answer with diagram. (6)

(c) In a resonance column experiment first and second resonance length were 17.6 cm and 53.2 cm when executed by a tuning fork of frequency 484 Hz. If lab temperature is 25^0C. calculate the velocity of sound in air.. (6)

****