TED (15/19) - 1003
(REVISION-2015/19)

N21-08808

Reg.No………………
Signature…………….

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANGEMENT/
COMMERCIAL PRACTICE - NOVEMBER 2021**

ENGINEERING PHYSICS - I

(Maximum Marks:75)

(Time: 2¼ hours)

PART - A

Marks

I.   Answer *any three* questions in one or two sentences. Each question carries 2 marks.

1.   Define Simple Harmonic Motion. Give two examples for Simple Harmonic Motion.
2.   Define the terms Stress and Strain. Give the unit of Stress and Strain.
3.   Write any four advantages of SI over other systems.
4.   Why open pipes are preferred to closed pipes in musical instruments?
5.   Distinguish between streamline and turbulent flow   (3 x 2 = 6)

PART - B

II   Answer *any four* of the following questions. Each question carries 6 marks.

1.   State Bernoulli's Principle. Explain the working of an atomizer using Bernoulli's Principle.
2.   A body moving with velocity 30m/s is brought to rest in 15s. Find the retardation. Find also the distance travelled in that time.
3.   State and explain law of conservation of linear momentum in the case of elastic collision.
4.   Show that the power developed in a rotating body is given by $2 \bar{\Lambda}$ NC where N is the number of revolution per sec and C is the moment of couple.
5.   The volume of a metal sphere of radius 7 cm is decreased by $0.019 cm^3$ when subjected to a pressure of $124 x 10^3 N/m^2$. Fin out its Bulk Modulus.
6.   Explain the term viscosity. On what factors does the viscous force acting tangentially on a layer depend?   (4 x 6 = 24)

PART – C

(Answer *any of the three units* from the following. Each full question carries 15 marks.)

UNIT - I

III   (a)   Obtain an expression for the distance travelled by a particle during the nth second of its motion   (3)

(b) Prove that the time of ascent is equal to time of descent for a body projected vertically upward. (6)

(c) Explain recoil motion of a gun and derive an expression for its recoil velocity. (6)

OR

IV (a) State Newton's second law of motion and derive an expression for force (3)

(b) A body travels 20m during 7th second and 24m during 9th second. Find out the distance travelled during the 15th second. (6)

(c) Write equation of motion for a body projected vertically upwards. If P is the momentum and E is the Kinetic Energy of a mass m, show that p $=\sqrt{2ME}$ (6)

UNIT – II

V (a) Explain the term couple and mention the characteristics of couple (3)

(b) State the law of Parallelogram of forces. Find out the magnitude and direction of the resultant of two forces P and Q acting at an angle $\ominus$. (6)

(c) What are coplanar forces? Describe the conditions for translational and rotational equilibrium of a body under coplanar parallel forces. (6)

OR

VI (a) The largest resultant of two forces P and Q is 31N and the least I is17N. What is the resultant when P and Q act at right angles. (3)

(b) Obtain an expression for the work done by a rotating couple. (6)

(c) At the marks 30cm, 45 cm and 86 cm of meter scale of mass 0.5 kg, weight 1kg, 2 kg and 3kg respectively are suspended. Where should the scale be suspended so that it remains horizontal? (6)

UNIT – III

VII (a) Discuss the variation of viscosity of liquids and gases with temperature. (3)

(b) A wire of cross sectional area 2 x 10^{-4} m^2 and having elastic properties is stretched by a force to double its original length. Calculate the force applied if the Young's modulus of the wire is 9 x 10^{10} N/m^2. (6)

(c) State equation of continuity in the case of a fluid flowing through a pipe of varying cross section. What are the inference obtained from equation of continuity. (6)

OR

VIII   (a)   Write a note on three kinds of modulus of Elasticity.   (3)

       (b)   Explain Stoke's formula and derive an expression for terminal velocity of a sphere falling through a viscous fluid.   (6)

       (c)   27 identical droplets of water come down through air with constant terminal velocity 1cm/sec. Find the terminal velocity when they combine to form a single drop.   (6)

UNIT – IV

IX   (a)   Velocity of sound in air at 0° C is 330m/sec. Find the velocity when the temperature becomes 1° C.   (3).

      (b)   Prove that the projection of uniform circular motion on the axis of the circle is Simple Harmonic.   (6)

      (c)   Distinguish between free vibrations and forced vibrations. What is resonance? When does it happen?   (6)

OR

X   (a)   Give three characteristics of wave motion. Derive the relation $v = f\lambda$ (3)

     (b)   Discuss the resonance column experiment to determine velocity of sound in air.   (6)

     (c)   What are stationary wave. Mention any four characteristics of stationary waves. What is end correction as applied to vibrations of air column contained in pipes?   (6)

………….