END SEMESTER/RETEST EXAMINATION 2020
(New Syllabus)

Semester: 1st semester
Subject code: SC-104
Subject: APPLIED PHYSICS-I

Full Marks: 70 (Part A -25 marks + Part B-45 marks)
Duration: 3 hours

Instructions:
Questions on Part A are compulsory.
Answer any five questions from Part B.

PART- A
MARK- 25

**Question 1:   Fill in the blanks:**   1 x 10= 10

(a)   Specific gravity of water is _____.

(b)   Work is a _____ quantity.

(c)   Inertia depends on _____ of an object.

(d)   The dimensional formula of Kinetic energy is _____.

(e)   Sound moves faster in _____ air then dry air.

(f)   Impulse is the product of _____ and time.

(g)   The unit SI unit of thermal capacity is _____.

(h)   The rate of change of velocity is called_____.

(i)   During change of state, the temperature of material remain _____.

(j)   Water stored in a dam possesses_____ energy.

Question no. 2: State true or false   1 x 10= 10

(a)   The velocity of sound in moist air is less than that of dry air.

(b)   Evaporation is a fast process.

(c)   Unit of dew point is degree centigrade.

(d)   Poisson's ratio is unit less.

(e)   Angular velocity is the product of radius and linear velocity.

(f)   Melting point of a substance does not depend on pressure.

(g)   Bats cannot produce ultrasound.

(h)   1 Kg Wt. = 9.8 N

(i)   The principal of Hydraulic press is based on Pascal's law.

(j)   The moment of inertia of a body about a given axis depends upon the angular velocity of the body.
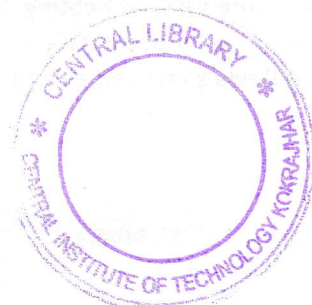
Question no. 3: Select the correct answer: 1 x 5= 5

a. Which one of the following quantities is dimensionless?
    (i)Angle   (ii) Mass   (iii) Pressure   (iv) Velocity

b. When a constant force is applied to a body, which one of the following remains constant?
    (i)Momentum (ii)Velocity   (iii) Acceleration   (iv)Kinetic energy

c. Velocity of sound in vacuum is
    (i)3×10^8 m/s   (ii) 332 m/s   (iii) 1250 m/s   (iv) Zero

d   Which of the following instrument is used to measure atmospheric pressure?
    (i)Calorimeter   (ii) Thermometer   (iii) Barometer (iv) Altimeter

e   The weight of a body is zero at
    (i)The surface of the earth   (ii) The center of the earth
    (iii) 100km above the surface of the earth   (iv) None of the above.

PART- B
MARK- 45

Question no. 4

a. Define scalar and vector. Give examples.   2+1=3
b. What do you mean by inertia? Define inertia of rest, inertia of motion and inertia of direction.
                                                                                1+2=3
c. A truck starting from rest maintains a constant acceleration of 10m/s 2. How long will it take to cover 20Km?
                                                                                3

Question no. 5

a. Derive the relation between 'G' and 'g'. Write the unit of G.   2+1=3
b. What do you mean by pressure? Derive an expression for the pressure exerted by liquid column of height 'h'
                                                                                1+2=3
c. State Newtown's third law of motion. Explain it by the examples of its application.   1+2=3
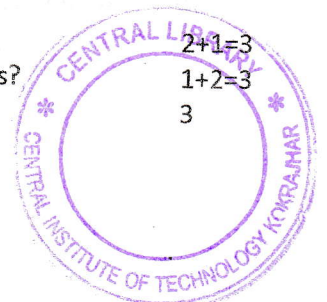
Question no. 6

a. What do you mean by kinetic energy of a body? Derive an expression for the same.   1+2=3
b. State and prove the principle of conservation of momentum.   3
c. Distinguish between heat and temperature. What is absolute zero of temperature?   2+1=3

Question no. 6

a. Define Conduction, Convection and Radiation.   3
b. What is evaporation? Distinguish between evaporation and boiling.   1+2=3
c. 100g of ice is at 0 °C added to 100g of water at 40 °C. Find the common temperature.   3

Question no. 7

a. State Joule's law of heating. Write the SI unit of heat.   2+1=3
b. Define melting point. What are the factors on which melting point depends?   1+2=3
c. State Boyle's law and explain it.   3

2

Question no.8

a. Calculate the frequency of a wave of wavelength 100 meter moving with a velocity of 300 m/s. 3

b. Prove by an experiment that material medium is necessary for the propagation of sound. 3

c. Explain the propagation of a longitudinal wave in air. Show how compression and rarefaction occurs.

3

Question no. 9

a. Prove that dimensions of kinetic energy and potential energy are same. 3

b. Find the thrust on the bottom of a water tank whose length, breadth and depth are 6m, 4m and 1.5m respectively. 3

c. What do you mean by acceleration due to gravity? Derive an expression for variation of 'g' below the surface of the earth, at depth 'h'. 1+2=3

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