16504

BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – Dip.CE-2024/Dip.CSE-2024/Dip.EE-2024/Dip.ME-2024/Dip.RA-2024/Dip.CSE-2025/Dip.EE-2025/Dip.ME-2025
Course Name – Applied Physics - I
Course Code - DBS00002
(Semester I)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Identify the dimensional formula of volume.
a) $[L^2]$ b) $[L^3]$
c) $[L]$ d) $[L^{-1}]$

(ii) Identify the fundamental physical quantity.
a) Acceleration b) Velocity
c) Force d) Time

(iii) Light year is a unit of ______.
a) time b) distance
c) pressure d) mass

(iv) The shortest distance between the initial and final position of an object is called ______.
a) displacement b) velocity
c) current density d) amplitude

(v) At a particular instant, the velocity of a body is called _______.
a) instantaneous acceleration b) instantaneous velocity
c) instantaneous displacement d) instantaneous speed

(vi) When a body falls freely under gravity, then the work done by gravity is ______.
a) positive b) negative
c) zero d) infinity

(vii) Identify the material with the highest elasticity.
a) Steel b) Copper
c) Rubber d) Aluminum

(viii) Identify the quantity that has the same dimensional formula as stress.
a) Pressure b) Impulse

c) Strain
d) Force

(ix) Identify the quantity responsible for raindrops to be spherical.

a) Surface tension
b) Charge
c) Acceleration due to gravity
d) Temperature

(x) The unit of surface energy is _____.

a) pascal
b) poise
c) joule
d) newton

(xi) A convex lens is called _____.

a) a converging lens
b) a diverging lens
c) a reflecting lens
d) none of these

(xii) Decibel is the unit of sound _____.

a) wavelength
b) intensity
c) frequency
d) none of these

(xiii) Doppler effect changes _____ of a sound wave.

a) frequency
b) both the speed and the frequency
c) both the intensity and the frequency
d) speed

(xiv) Light travels fastest in _____.

a) water
b) air
c) oil
d) glass

(xv) The energy possessed by a body due to its position is called _____.

a) kinetic energy
b) potential energy
c) mechanical energy
d) electrical energy

Group-B
(Short Answer Type Questions) 3 x 5=15

2. Define Young's modulus. Between steel and rubber, which material is more elastic? (3)

3. Determine the frequency of a sound wave whose time period is 0.2 second. Based on your result, predict whether the sound is within the audible range for humans. (3)

4. Derive the dimensions of area and density. (3)

5. A device operates at a constant power of 12 watts for 5 seconds. Calculate the work done. (3)

6. Define the term linear momentum. State the principle of conservation of linear momentum. (3)

OR

An object of mass 100 kg is subjected to a force of 50 N. Calculate the acceleration of the object. (3)

Group-C
(Long Answer Type Questions) 5 x 6=30

7. Draw the diagrams for a biconvex lens and a plano-convex lens. Given that the power of the lens is 2.0 D, calculate its focal length. (5)

8. Define longitudinal strain and state its SI unit. A wire of initial length 10 cm is stretched to an additional length of 0.1 cm under an applied force. Calculate the strain produced in the wire. (5)

9. Determine the dimension of force and state its SI unit. A 5 kg body is moving with velocity 10 m/s. It comes to a stop in 20 seconds with a negative acceleration of 0.5 m/s^2. Calculate the force needed to stop the body. (5)

10. A body with a mass of 5 kg is lifted vertically from the ground to a height of 20 m. Calculate the work done against gravity during this process.Write SI unit of work done. Take gravitational acceleration is 9.8 m/s^2. (5)

11. State the laws of reflection of light. If incident angle of a ray on a plane mirror is 40°, determine the angle of reflection, angle between incident ray and reflected ray, and angle between reflected ray and the plane of the mirror. (5)

12. An object with a mass of 10 kg is in motion with a velocity of 20 m/s. Using the appropriate formula, calculate the linear momentum of the object. State the dimension of linear momentum. (5)

OR

Define the impulse of a force. Derive the mathematical relationship between impulse and the change in linear momentum of a particle. (5)

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