Tsi11P

Tenkasi District

Common Second Revision Test - 2025

10.02.25.

Standard 11

PHYSICS

Time Allowed: 3.00 Hours Maximum Marks: 70

PART - A

I. Answer all the questions: **15×1=15**

1) According to Keplar's second law, the radial vector to a planet from the sun sweeps out equal areas in equal intervals of time. This law is a consequence of
a) conservation of linear momentum b) conservation of angular momentum
c) conservation of energy d) conservation of kinetic energy

2) The Young's modulus for a perfect rigid body is
a) 0 b) 1 c) 0.5 d) infinity

3) The efficiency of a heat engine working between the freezing point and boiling point of water is
a) 6.25% b) 20% c) 26.8% d) 12.5%

4) The frequency for simple hormonic motion given by $y = 0.3 \sin(40\pi t + 1.1)$ is
a) 40 Hz b) 20 Hz c) 80 Hz d) 10 Hz

5) If $\pi = 3.14$, then the value of π^2 is
a) 9.8596 b) 9.860 c) 9.86 d) 9.9

6) If earth complete one revolution in 24 hours. What is the angular displacement made by earth in one hour.
a) 60° b) 360° c) 30° d) 15°

7) A book is at rest on the table which exerts a normal force on the book. If this force is considers as reaction force, what is the action force according to Newton is third law?
a) Gravitational force exerted by earth on the book.
b) Gravitational force exerted by the book on earth.
c) Normal force exerted by the book on the table.
d) None of the above

$B = 3i - 2j + 4k$

8) Dimensional formula for power is
a) ML^2T^{-2} b) ML^2T^{-3} c) $ML^{-1}T^{-1}$ d) MLT^{-2}

9) Four round objects namely a ring, a disc, a hollow sphere, and a solid sphere with some radius starts to roll down an incline at the same time. Then which object will reach the bottom first.
a) Ring b) Disc c) Hollow sphere d) Solid sphere

10) When a cycle tyre suddenly bursts, the air inside the tyre expands. This process is
a) isothermal b) adiabatic c) isobatic d) isochoric

11) Which of the following shows the correct relationship between the pressure and density of an ideal gas at constant temperature → Enclos-
a) b) c) d)

12) In a simple hormonic oscillation, the acceleration against displacement for one complete oscillation will be
a) an ellipse b) a circle c) a parabola d) a straight line

13) A sound wave whose frequency is 5000 Hz in air and then hits the water surface. The ratio of its wavelengths in water and air is
a) 4.30 b) 0.23 c) 5.30 d) 1.23

14) Identify the unit vector in the following
a) $\hat{i} + \hat{j}$ b) $\frac{\hat{i}}{\sqrt{2}}$ c) $\hat{k} - \frac{\hat{j}}{\sqrt{2}}$ d) $\frac{\hat{i} + \hat{j}}{\sqrt{2}}$

15) A couple produces
a) pure rotation b) pure translation
c) rotation and translation d) no motion

PART - B

II. Answer any six questions: (Q.No. 24 is compulsory) **6×2=12**

16) Define gravitational potential.
17) What are the practical applications of capillarity?
18) Eiffel tower is made up of iron and its height is roughly 300m. During winter season in France the temperature is 2°C and in hot summer its average temperature is 25°C. Calculate the change in height of Eiffel tower between summer and winter. The linear thermal expansion coefficient for iron of $\alpha = 10 \times 10^{-6}$ /°C.
19) State the principle of homogenity of dimensions.
20) How do you deduce that two vectors are perpendicular?
21) Calculate the speed of sound in a steel rod whose young's modulus $Y = 2 \times 10^{11}$ Nm^{-2} and $\rho = 7800$ Kgm^{-3}.
22) Define the unit of force.
23) Give any two examples of torque in day-to-day life.
24) A variable force $F = Kx^2$ acts on a particle which is initially at rest. Calculate the work done by the force during the displacement of the particle from x=0 to x=4m. [Assume $K=1Nm^{-2}$]

PART - C

III. Answer any SIX questions: (Q.No. 33 is compulsory) **6×3=18**

25) Write down the postulates of Kinetic theory of gases.
26) Describe Newton's formula for velocity of sound waves in air.
27) Define molar specific heat capacity and give its unit.
28) A metal cube of side 0.20 m is subjected to a shearing force of 4000N. The top surface is displaced through 0.50 cm with respect to the bottom. Calculate the shear modulus of elasticity of the metal.
29) Explain the variation of g with altitude.
30) What is meant by conservative force? Give example.
31) The position vector of a particle is given by $\vec{r} = 3t\hat{i} + 5t^2\hat{j} + 7\hat{k}$. Find the direction in which the particle experiences net force?
32) Write a note on Gross Error.
33) Calculate the area of the parallelogram whose adjacent sides are given by vectors $\vec{A} = 2\hat{i} + 3\hat{j} + 5\hat{k}$ and $\vec{B} = 3\hat{i} - 2\hat{j} + 4\hat{k}$.

PART - D

IV. Answer ALL the questions: **5×5=25**

34) a) i) What are the advantages of SI unit system?
ii) Explain the types of physical quantities.

(OR)

b) Describe the vertical oscillations of a spring.

35) a) Derive the Kinematic equations of motion for constant acceleration.

(OR)

b) Explain how overtones are produced in a closed organ pipe.

36) a) i) Using free body diagram, show that it is easy to pull an object than to push it.
ii) List a few methods to reduce friction.

(OR)

b) Derive the expression for moment of inertia of a rod about its centre and perpendicular to the rod.

37) a) State and explain work - energy principle.

(OR)

b) Derive an expression for escape speed.

38) a) Derive the expression for the terminal velocity of a spring moving in a highly viscous liquid.

(OR)

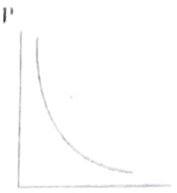
b) Derive an expression for mean free path of the gas.

அலகு 11

இயற்பியல் வினாத்தாளில்

விருப்பப் பாடத்தின் தனியாக கொடுக்கப்பட்டுள்ளது.

11) பின்வருவனவற்றுள் எந்த வரைபடம் மாறா வெப்பநிலையிலுள்ள நல்லியல்பு வாயுவின் அழுத்தம் மற்றும் அடர்த்தியின் சரியான தொடர்பைக் காட்டுகிறது

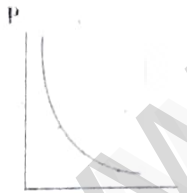
a) 

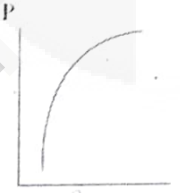
b) 

c) 

d) 

11) Which of the following shows the correct relationship between the pressure and density of an ideal gas at constant temperature

a) 

b) 

c) 

d)