Roll No. of Candidate : _____

PHYSICS **Intermediate Part-I , Class 11th (1stA 324- IV)** **Paper : I** **Group – II**

Time: 20 Minutes **OBJECTIVE** **Code : 6478** GUJ-2-24 **Marks: 17**

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

1. 1 - In angular motion, the centripetal force is

(A) $mr^2\omega^2$ (B) $m^2r^2\omega$ (C) $mr^2\omega$ (D) $mr\omega^2$

2 - If temperature of sink increases, the efficiency of Carnot Engine

(A) decreases (B) increases

(C) remains the same (D) first increases then decreases

3 - The detector in photo-phone is made up of

(A) Germanium (B) Selenium (C) Cadmium (D) Silicon

4 - The dimensions of the relation $\sqrt{\frac{F \times \ell}{m}}$ are equal to the dimensions of

(A) Force (B) Impulse (C) Momentum (D) Velocity

5 - Dot product of force and velocity is

(A) Work (B) Momentum (C) Power (D) Impulse

6 - In reversible process the entropy of system

(A) increases (B) decreases (C) remains constant (D) becomes zero

7 - Newton rings are formed due to

(A) diffraction (B) reflection (C) refraction (D) interference

8 - The maximum drag force on falling sphere is 9.8 N, its weight is

(A) 9.8 N (B) 19.8 N (C) 4.9 N (D) 49 N

9 - Distance covered by a body in one vibration is 20 cm. The amplitude of vibration will be

(A) 5 cm (B) 10 cm (C) 15 cm (D) 20 cm

10 - Torque is the rotational analogous of

(A) Momentum (B) Impulse (C) Force (D) Power

11 - In which quadrant, vector $3\hat{i} - 5\hat{j}$ lies?

(A) 1st (B) 2nd (C) 3rd (D) 4th

12 - A fighter plane is chasing another plane, when it opens fire, its speed

(A) increases (B) decreases

(C) remains constant (D) first increases then decreases

13 - 2 revolutions are equal to

(A) $\frac{\pi}{2}$ rad (B) π rad (C) 2π rad (D) 4π rad

14 - Speed of sound is independent of

(A) density (B) temperature (C) elasticity (D) pressure

15 - The unit of work in base units is

(A) kg ms^2 (B) kg m^2s^{-2} (C) kg $m^{-2}s^2$ (D) kg m^2s^2

16 - Star moving towards the earth shows

(A) red shift (B) blue shift (C) yellow shift (D) green shift

17 - The distance covered by free falling body in 2 seconds is

(A) 9.8 m (B) 19.6 m (C) 4.9 m (D) 49 m

PHYSICS **Intermediate Part-I , Class 11th (1stA 324)** **Paper : I Group -- II**

Time: 2:40 Hours **SUBJECTIVE** GUJ-2-24 **Marks: 68**

Note: Section I is compulsory. Attempt any THREE (3) questions from Section II.

SECTION – I

2. Write short answers to any EIGHT questions. **(2 x 8 = 16)**

i. The period of pendulum is measured by a stop watch. What types of errors are possible in the time standard?
ii. Does a dimensional analysis give any information on constant of proportionality that may appear in algebraic expressions? Explain.
iii. Differentiate between precision and accuracy.
iv. How many seconds are there in one year? Explain.
v. Can a vector have a component greater than the vector's magnitude?
vi. A force of 10 N makes an angle of 60° with x-axis. Find its x and y components.
vii. Give two factors on which turning effect depends.
viii. Explain the circumstances in which velocity $\vec{v}$ and acceleration $\vec{a}$ are perpendicular to one another.
ix. A rubber ball and a lead ball of same size are moving with same velocity. Which ball has greater momentum and why?
x. How will you differentiate between uniform and variable velocity?
xi. An object has 1 J of potential energy. Explain.
xii. What is escape velocity? Write the formula of escape velocity.

3. Write short answers to any EIGHT questions. **(2 x 8 = 16)**

i. A disc and a hoop start moving down from the top of an inclined plane at the same time. Which one will be moving faster on reaching the bottom?
ii. Why centripetal force is required to keep a body moving on a circular track?
iii. State the direction of the following vectors in simple situations: angular momentum and angular velocity
iv. What does (INTELSAT) stand for?
v. Explain the term viscosity.
vi. What is difference between laminar flow and turbulent flow?
vii. Does frequency depend on amplitude for harmonic oscillator?
viii. Differentiate between undamped and damped oscillations with the help of a graph between amplitude and time.
ix. Name two characteristics of simple harmonic oscillator.
x. As a result of a distant explosion, an observer senses a ground tremor and then hears the explosion. Explain the time difference.
xi. How are beats useful in tuning musical instruments?
xii. How bats navigate their food?

4. Write short answers to any SIX questions. **(2 x 6 = 12)**

i. An oil film spreading over a wet footpath shows colours. Explain.
ii. How will you differentiate between interference and diffraction of light waves?
iii. 20000 lines per centimeter has been ruled on a diffraction grating. Find its grating element.
iv. How the power is lost in optical fibre through dispersion? Explain.
v. Why would it be advantageous to use blue light with a compound microscope?
vi. Find magnifying power of convex lens of 15 cm focal length acts as a magnifying glass.
vii. Specific heat of a gas at constant pressure is greater than specific heat at constant volume. Why?
viii. Why is the average velocity of the molecules in a gas zero but the average of the square of velocities is not zero?
ix. State Second Law of Thermodynamics in terms of entropy.

(Turn Over)

SECTION – II

5. (a) What is an isolated system? State and explain law of conservation of linear momentum. (5)
   (b) Given that $\vec{A} = \hat{i} - 2\hat{j} + 3\hat{k}$ and $\vec{B} = 3\hat{i} - 4\hat{k}$, find the projection of $\vec{A}$ and $\vec{B}$ (3)

6. (a) Discuss the interconversion of potential and kinetic energy when frictional force is not considered. (5)
   (b) The wavelength of the signals from a radio transmitter is 1500 m and the frequency is 200 KHz. What is wavelength for a transmitter operating at 1000 KHz and with what speed the radio waves travel? (3)

7. (a) What is meant by real and apparent weight? Develop a relation between real and apparent weight (in case of an elevator). (5)
   (b) What should be length of a simple pendulum whose period is 1.0 second at a place where $g = 9.8\ ms^{-2}$ (3)

8. (a) Derive Bernoulli's Equation for an ideal fluid. (5)
   (b) 336 J of energy is required to melt 1 g of ice at 0°C. What is the change in entropy of 30 g of water at 0°C as it is changed to ice at 0°C by a refrigerator? (3)

9. (a) What is Michelson's interferometer? Explain its working and derive its equation. (5)
   (b) A glass light pipe in air will totally internally reflect a light ray if its angle of incidence is at least 39°. What is the minimum angle for total internal reflection if pipe is in water (Refractive index of water = 1.33) (3)