FBD-II-6219

Roll No. : _____

Objective
Paper Code
6472

Intermediate Part First (New Scheme)

PHYSICS (Objective) GROUP - II

Time: 20 Minutes Marks: 17

☆

Q.No.1 **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.**

S.#	Questions	A	B	C	D
1	Dimensions of power are:	$[ML^2T^{-3}]$	$[M^2LT^{-2}]$	$[MLT^{-1}]$	$[MLT^{-2}]$
2	If error in measurement of radius of circle is 2%, then permissible error in its area will be:	1%	2%	4%	8%
3	Three vectors $\vec{A}$, $\vec{B}$ and $\vec{C}$ satisfy the relation $\vec{A} \cdot \vec{B} = 0$ and $\vec{A} \cdot \vec{C} = 0$, the vector $\vec{A}$ is parallel to:	$\vec{B}$	$\vec{C}$	$\vec{B} \cdot \vec{C}$	$\vec{B} \times \vec{C}$
4	Angle between the vectors $(\hat{i} + \hat{j})$ and $(\hat{j} + \hat{k})$ is:	0°	60°	90°	180°
5	If the momentum of a body is numerically equal to its kinetic energy, then speed of body is:	$1ms^{-1}$	$2ms^{-1}$	$4ms^{-1}$	$8ms^{-1}$
6	Area under force-displacement graph gives:	Velocity	Power	Work done	Acceleration
7	In rotational motion, analogous of mass is:	Momentum	Inertia	Moment of inertia	Angular momentum
8	A body is moving in a circular path. The angle between its linear velocity and angular velocity is:	180°	90°	45°	0°
9	The velocity of rain drop attains constant value due to:	Air currents	Upthrust of air	Surface tension	Viscous force exerted by air
10	Speed of efflux is measured by the relation:	$v = \sqrt{gh}$	$v = \sqrt{\frac{gh}{2}}$	$v = \sqrt{2gh}$	$\sqrt{\frac{4}{3}gh}$
11	In mass spring system, $\frac{1}{2}kx_0^2$ represents:	Total energy	K.E	P.E	Velocity
12	Speed of sound in vacuum at a temperature of 0°C is:	$332ms^{-1}$	$340ms^{-1}$	$333ms^{-1}$	Zero
13	The frequency of sound in a medium is "f" and velocity "v", if frequency in same medium becomes "4f" then velocity will be:	v	2v	3v	4v
14	In Young's double slit experiment, the fringe spacing is equal to:	$\frac{d}{\lambda L}$	$\frac{\lambda}{Ld}$	$\frac{\lambda L}{d}$	$\frac{\lambda d}{L}$
15	Nature of image in compound microscope is:	Real and inverted	Real and erect	Virtual and inverted	Virtual and erect
16	When all systems are taken together as the universe, the entropy of universe always:	Decrease	Increase	Remains unchanged	Nothing can be decided
17	The efficiency of diesel engine is about:	10% to 20%	15% to 25%	25% to 35%	35% to 40%

BLANK

FBD-11-G2

Intermediate Part First (New Scheme) Roll No. _____

PHYSICS (Subjective) GROUP - II

Time: 02:40 Hours Marks: 68

SECTION – I

2. **Write short answers to any EIGHT parts.** 16

(i) Write the dimensions of pressure and density.
(ii) Differentiate between precise and accurate measurement.
(iii) Can the magnitude of a vector have negative value? Explain.
(iv) Can you add zero to a null vector? Explain.
(v) Determine the direction of $\vec{A} = -3\hat{i} - 8\hat{j}$ with positive x-axis.
(vi) An object has one joule of potential energy. Explain what does it mean?
(vii) What do you mean by aquifer?
(viii) Explain the difference between laminar flow and turbulent flow.
(ix) How an aeroplane is lifted upward?
(x) Can we realize an ideal simple pendulum? Explain.
(xi) Does frequency depend on amplitude for harmonic oscillators?
(xii) A spring of spring constant 'k' is cut into two equal lengths then what will be the spring constant for each part? Explain.

3. **Write short answers to any EIGHT parts.** 16

(i) Show that impulse and momentum have same units.
(ii) An object is thrown vertically upward. Discuss the sign of acceleration due to gravity, relative to velocity while object is in air.
(iii) Explain the conditions in which velocity v and acceleration a of a car are perpendicular to each other.
(iv) Define ballistic missile and ballistic trajectory.
(v) Show that 1 rad = 57.3°
(vi) What is meant by moment of inertia? Explain its significance.
(vii) Describe what should be the minimum velocity for a satellite to orbit close to the earth around it.
(viii) How artificial gravity is produced in the artificial satellite? Explain.
(ix) How are beats useful in tuning a musical instrument? Explain.
(x) Why sound travels faster in solids than in gasses?
(xi) Define electromagnetic waves. Give example.
(xii) Is it possible for two identical waves travelling in same direction along a string to give rise to stationary waves? Explain.

4. **Write short answers to any SIX parts.** 12

(i) Give the two parts of Huygen's principle.
(ii) Under what conditions two or more sources of light behave as coherent sources?
(iii) How would you distinguish between un-polarized and plane-polarized light?
(iv) What is resolving power of an optical instrument? Give its formula.
(v) Why would it be advantageous to use blue light with a compound microscope?
(vi) Derive Charles' law from the kinetic molecular theory of gasses.
(vii) Why does the pressure of a gas in a car tyre increase when it is driven through some distance?
(viii) Can the mechanical energy be converted completely into heat energy? If so give an example.
(ix) Does entropy of a system increase or decrease due to friction? Briefly explain using formula for change in entropy.

SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) What is meant by dimensions of physical quantities? How can you derive formula for the time period of simple pendulum using dimensional analysis? 05

(b) Estimate the average speed of nitrogen molecules in air under standard conditions of pressure and temperature. 03

6. (a) State and prove law of conservation of momentum. 05

(b) Two particles are located at $\vec{r}_1 = 3\hat{i} - 7\hat{j}$ and $\vec{r}_2 = -2\hat{i} + 3\hat{j}$ respectively. Find both the magnitude of the vector $(\vec{r}_2 - \vec{r}_1)$ and its orientation with respect to the x-axis. 03

7. (a) What are stationary waves? Discuss the stationary waves in air column with (i) both ends open (ii) one end open. 01.04

(b) How large a force is required to accelerate an electron ($m = 9.1 \times 10^{-31}$ kg) from rest to a speed of 2.0×10^{7} ms^{-1} through a distance of 5.0cm ? 03

8. (a) Derive a relation for the frequency of a rotating spaceship to achieve the artificial gravity equal to earth's gravity. 05

(b) A block of mass 4kg is dropped from a height [illegible] on to a spring of spring constant $k = [illegible]$ N/m. Find the maximum distance through which the spring will be compressed 03

9. (a) What is a diffraction grating? Derive grating equation for finding the wave length of light used 05

(b) An astronomical telescope having magnifying power of 5 consists of two thin lenses 24cm apart. Find the focal lengths of the lenses. 03