FBD-11-G1-19

Roll No. : _____

Objective
Paper Code
6477

Intermediate Part First (New Scheme)
PHYSICS (Objective) GROUP - I
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	Equation of continuity gives conservation of:	Energy	Power	Mass	Density
2	Orbital velocity of a satellite of mass "m_s" orbiting around earth of mass "M" is:	$\sqrt{\frac{GM}{r}}$	$\sqrt{\frac{Gm_s}{r}}$	$\frac{GM}{r}$	$\sqrt{gR}$
3	In rotational motion analogous of force is:	Torque	Inertia	Velocity	Momentum
4	Scalar product of force and velocity is:	Work	Power	Energy	Acceleration
5	Impulse has same unit as that of:	Force	Energy	Mass	Linear momentum
6	Cross-product of $\vec{j} \times \vec{k}$ is:	Zero	1	$\vec{i}$	$-\vec{i}$
7	Rectangular components have angle between them is:	30°	45°	60°	90°
8	The quantity 2.3×10^{-3} can be written as:	0.0023	0.023	0.23	2.3
9	Light year is the unit of:	Light	Time	Velocity	Distance
10	An ideal heat engine can only be 100% efficient if its cold temperature is:	0K	0°C	100K	100°C
11	Average translational K.E of a gas molecule is:	$\frac{1}{2}kT$	kT	$\frac{2}{3}kT$	$\frac{3}{2}kT$
12	Near point for a person is at:	25cm	25mm	25nm	25dm
13	Angle between ray of light and wave front is:	Zero	60°	45°	90°
14	Speed of sound in vacuum is:	$332\frac{m}{s}$	$333\frac{m}{s}$	$280\frac{m}{s}$	Zero
15	If a string vibrates in " n " loops, the wavelength of stationary wave will be:	$\frac{2\ell}{n}$	$\frac{n\ell}{2}$	$\frac{2n}{\ell}$	$\frac{\ell}{2n}$
16	Product of frequency " f " and time " t " is:	1	Displacement	Velocity	Amplitude
17	Product of area of cross section, velocity and time gives:	Volume	Density	Mass	Weight

FBD-11-G1

Intermediate Part First (New Scheme) Roll No

PHYSICS (Subjective) GROUP - I

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) Define radian and steradian.
   (iii) Two vectors have unequal magnitudes. Can their sum be zero? Explain.
   (iv) Suppose the sides of a closed polygon represent vectors arranged head to tail. What is the sum of these vectors?
   (v) Give two factors on which turning effect depends.
   (vi) When a rocket re-enters the atmosphere, its nose cone becomes very hot. Where does this heat energy come from?
   (vii) Define law of conservation of energy.
   (viii) Explain the difference between laminar flow and turbulent flow.
   (ix) Define venturi effect. Also write its relation.
   (x) If a mass spring system is hung vertically and set into oscillations, why does the motion eventually stop?
   (xi) Describe some common phenomena in which resonance plays an important role.
   (xii) Define periodic motion. Give example.

3. **Write short answers to any EIGHT parts.** 16
   (i) At what point or points in its path does a projectile have its minimum speed, its maximum speed?
   (ii) Can the velocity of object reverse the direction when acceleration is constant? If so, give an example.
   (iii) The horizontal range of projectile is four times of its maximum height. What is angle of projection?
   (iv) Define ballistic flight and ballistic trajectory.
   (v) When mud flies off the tyre of a moving bicycle, in which direction does it fly? Explain.
   (vi) Why does a diver change his body positions before and after diving in the pool?
   (vii) Differentiate between real weight and apparent weight.
   (viii) How many radians are there in 2 degree?
   (ix) Explain the terms crest, trough node and anti-node.
   (x) How are beats useful in tuning musical instruments?
   (xi) Why sound travel faster in hydrogen than in oxygen?
   (xii) What do you mean by sonar technique? Explain briefly.

4. **Write short answers to any SIX parts.** 12
   (i) How would you distinguish between unpolarized light and polarized light?
   (ii) An oil film spreading over a wet footpath shows colours. Explain how does it happen?
   (iii) Under what conditions two or more sources of light behave as coherent sources?
   (iv) Why would it be advantageous to use blue light with a compound microscope?
   (v) Differentiate between linear magnification and angular magnification.
   (vi) Why does the pressure of a gas in a car tyre increase when it is driven through some distance?
   (vii) Is it possible to convert internal energy into mechanical energy? Explain with an example
   (viii) Does the entropy of a system increase or decrease due to friction? Explain briefly
   (ix) State first law of thermodynamics.

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

5. (a) Derive Boyle's law and Charle's law from the pressure of a gas equation. 05
   (b) Suppose, we are told that the acceleration of a particle moving in a circle of radius r with uniform velocity v is proportional to some power of r, say r^n, and some power of v, say v^m, determine the powers of r and v. 03

6. (a) Define vector product. Write any four characteristics of vector product. 05
   (b) A 100g golf ball is moving to the right with a speed of 20ms $^{-1}$. It makes a head on collision with an 8kg steel ball, initially at rest. Compute velocities of the balls after collision. 03

7. (a) Discuss the inter-conversion of potential and kinetic energy in absence of air friction. Also discuss the effect of air resistance. 05
   (b) A stationary wave is established in a string which is 120cm long and fixed at both ends. The string vibrates in four segments, at a frequency of 120Hz. Determine its wavelength and the fundamental frequency. 03

8. (a) What is simple pendulum? Show that motion of simple pendulum is simple harmonic. Also derive expression for its time period. 05
   (b) A gramophone record turntable accelerates from rest to an angular velocity of 45 rev/min in 1.60s. What is its average angular acceleration?

9. (a) What is simple microscope? Describe its construction, working and also derive the relation for its angular magnification. 05
   (b) A light of λ = 589nm is incident normally on grating having 5000 lines per centimeter. What is the highest order, the spectrum obtained with this grating? 03