

FBD-11-18

Roll No. : _____

Objective
Paper Code
6471

Intermediate Part First (New Scheme)
PHYSICS (Objective)
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	Which is the base quantity?	Charge	Area	Force	Electric current
2	Light year is the unit of:	Time	Light	Velocity	Distance
3	Magnitude of resultant of two forces 6N and 8N acting at right angle to each other is:	6N	10N	8N	Zero
4	If both components of a resultant vector are negative then resultant lies in:	1st quadrant	2nd quadrant	3rd quadrant	4th quadrant
5	Rate of change of momentum is equal to:	Impulse	Torque	Velocity	Force
6	If work done is negative then the angle between force and displacement is:	Zero	90°	45°	Greater than 90°
7	Time period of geostationary satellite of radius "R" is:	6 hours	12 hours	18 hours	1 day
8	If a body of mass 10kg is falling freely, its apparent weight is:	Zero	98N	10N	980N
9	Pressure of fluid will be low where speed of fluid is:	Low	High	Zero	Constant
10	If amplitude of a simple pendulum is increased by four times its time period will be:	4 times	½ times	Same	2 times
11	Distance between two consecutive nodes is:	$\frac{\lambda}{2}$	$\frac{\lambda}{4}$	2λ	λ
12	Star moving away from earth shows:	Green shift	Blue shift	Red shift	Yellow shift
13	An oil film on water surface show colours due to:	Diffraction	Interference	Polarization	Dispersion
14	In sonar we use:	Sound waves	Ultrasonic waves	Radio waves	Microwaves
15	In normal adjustment the length of telescope is:	$\frac{f_o}{f_e}$	$\frac{f_e}{f_o}$	$1 + \frac{d}{f_e}$	$f_o + f_e$
16	Value of triple point of water is:	Zero Kelvin	1K	100K	273.16K
17	Unit of entropy is:	JK	$\frac{J}{K}$	$\frac{K}{J}$	$J^{-1}K^{-1}$

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SECTION – I

2. Write short answers to any EIGHT parts. 16
- (i) How many seconds are there in one year?
 - (ii) Does a dimensional analysis give any information on constant of proportionality that may appear in algebraic expression? Explain.
 - (iii) Give the drawbacks to use the period of a pendulum as a time standard.
 - (iv) Define radian and steradian.
 - (v) A vector \vec{A} lies in the XY-plane. For what orientation will both of its rectangular components be negative? For what orientation will its components have opposite signs?
 - (vi) Can a body rotate about its center of gravity under the action of its weight?
 - (vii) Define torque. Write its unit.
 - (viii) An object is thrown vertically upward. Discuss the sign of acceleration due to gravity, relative to velocity, while the object is in air.
 - (ix) At what points in its path does a projectile have its minimum speed, its maximum speed?
 - (x) Define ballistic missile and ballistic trajectory.
 - (xi) A person is standing near a fast moving train. Is there any danger that he will fall towards it?
 - (xii) What do you mean by laminar flow and turbulent flow?

3. Write short answers to any EIGHT parts. 16
- (i) In what situation work done by a force on a body is positive, negative and zero?
 - (ii) What is solar constant and what is its value?
 - (iii) An object has one Joule of potential energy. Explain what does it mean?
 - (iv) Why does a diver change his body positions before and after diving in the pool?
 - (v) What is the critical velocity? Find its value.
 - (vi) What is the main difference between Newton's and Einstein's views about gravitation?
 - (vii) Can we realize an ideal simple pendulum? Explain.
 - (viii) How resonance play role in tuning radio?
 - (ix) The amplitude of simple pendulum should be small, why? Explain.
 - (x) What are beats and name its one use?
 - (xi) How can doppler effect be used to monitor blood flow through major arteries?
 - (xii) Why does sound travel faster in solids than in gases?

4. Write short answers to any SIX parts. 12
- (i) Why the polaroid sunglasses are better than ordinary sunglasses?
 - (ii) Under what conditions two or more sources of light behave as coherent sources?
 - (iii) What is Huygen's principle?
 - (iv) Why would it be advantageous to use blue light with a compound microscope?
 - (v) How light signal is transmitted through the optical fiber?
 - (vi) Is it possible to convert the internal energy into mechanical energy? Give an example.
 - (vii) Define thermodynamic scale of temperature.
 - (viii) State second law of thermodynamics in terms of entropy.
 - (ix) Specific heat of a gas at constant pressure is greater than specific heat at constant volume. Why?

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

5. (a) Define vector product. Give four characteristics of the vector product. 05
 (b) A truck weighing 2500Kg and moving with a velocity of 21ms^{-1} collides with stationary car weighing 1000Kg. The truck and the car move together after the impact. Calculate their common velocity. 03
6. (a) Define rotational kinetic energy. Derive expression for rotational kinetic energy of a disc and a hoop. 05
 (b) A car of mass 800Kg travelling at the speed of 54kmh^{-1} is brought to rest in 60 meters. Find the average retarding force on the car. What has happened to original kinetic energy? 03
7. (a) Define the terminal velocity. Show that terminal velocity is directly proportional to the square of radius. 05
 (b) A Carnot engine whose low temperature reservoir at 7°C has an efficiency of 50%. It is desired to increase the efficiency to 70%. By how much degrees the temperature of source be increased? 03
8. (a) Define stationary waves and show that the stationary waves in a stretched string are harmonic series. 05
 (b) A block of mass 4.0Kg is dropped from a height of 0.80m on to a spring of spring constant 1960Nm^{-1} . Find the maximum distance through which the spring will be compressed? 03
9. (a) What is spectrometer? Discuss its different parts. Write its uses. 05
 (b) In double slit experiment, the second order maximum occurs at $\theta = 0.25^\circ$. The wavelength is 650nm. Determine the slit separation. 03