11th CLASS – 12019

PHYSICS (NEW COURSE)
GROUP FIRST
ACADEMIC SESSION : 2015 – 2017 TO 2018 - 2020

TIME: 20 MINUTES
MARKS: 17

OBJECTIVE

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.

QUESTION NO. 1

1	The prefix femto is equal to
	(A) 10^{-9} (B) 10^{-12} (C) 10^{-14} (D) 10^{-15}
2	The time taken by light from moon to earth is
	(A) 1 min 10 sec. (B) 1 min 20 sec. (C) 1 min 30 sec. (D) 1 min 40 sec.
3	If the magnitudes of scalar and vector product of two vectors are $2\sqrt{3}$ and 2 respectively. The angle between vectors is
	(A) $30°$ (B) $60°$ (C) $120°$ (D) $180°$
4	The resultant of two perpendicular vectors each of magnitude A is
	(A) A (B) 2A (C) $\sqrt{2}$ A (D) A^2
5	Ballistic missiles are used for
	(A) short ranges (B) long ranges (C) very long ranges (D) any range
6	Power of an electric heater is (approximate power)
	(A) 1 KW (B) 2 KW (C) 3 KW (D) 4 KW
7	A man in a lift moving upward with constant velocity will conclude that his weight has
	(A) Increased (B) Decreased (C) Reduced to zero (D) Not changed
8	The number of satellites in global positioning system is
	(A) 3 (B) 12 (C) 24 (D) 36
9	If the radius of droplet becomes half, then terminal velocity will become
	(A) Half (B) Four times (C) One third (D) One fourth
10	The systolic pressure for a normal healthy person is
	(A) 75 – 80 torr (B) 100 torr (C) 120 torr (D) 140 torr
11	If the length of simple pendulum is doubled then its time period becomes
	(A) Half (B) 2 times (C) $\sqrt{2}$ times (D) 4 times
12	The speed of sound in vacuum is
	(A) 330 ms^{-1} (B) 332 ms^{-1} (C) 3×10^8 ms^{-1} (D) Zero
13	It becomes difficult to recognize the beats when the difference between the frequencies of two sounds is more than
	(A) 10 Hz (B) 20 Hz (C) 30 Hz (D) 40 Hz
14	Bending of light around the edges of an obstacle is called
	(A) Refraction (B) Interference (C) Polarization (D) Diffraction
15	In multimode step index fiber, the value of refractive index of core is
	(A) 1.33 (B) 1.52 (C) 1.67 (D) 1.48
16	The approximate efficiency of dry cell battery is
	(A) 70 % (B) 80 % (C) 90% (D) 93 %
17	For an ideal gas, the P.E. associated with its molecules is equal to
	(A) $\frac{1}{2}$ KX (B) $\frac{1}{2}$ KX$_0^2$ (C) 2 KX$_0$ (D) Zero

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SECTION-I

QUESTION NO. 2 Write short answers any Eight (8) questions of the following   **16**

(1) Give the drawbacks to use the period of pendulum as a time standard.

(2) Is zero significant or not ? Explain?

(3) Define the null vector and give two examples

(4) Is it possible to add a vector quantity to scalar quantity ? Explain

(5) Can a body rotate about its centre of gravity under the action of its weight ? Explain briefly.

(6) A girl drops a cup from a certain height, which breaks into pieces. What energy changes are involved?

(7) Define kilowatt hours and show that $1\ KWh = 3.6\ MJ$.

(8) Why fog droplets appear to be suspended in air? Explain briefly.

(9) Write the three characteristics of an ideal fluid.

(10) Name two characteristics of simple harmonic motion.

(11) State Hook's law. Give SI unit of spring constant.

(12) What is driven harmonic oscillator ? Give example.

QUESTION NO. 3 Write short answers any Eight (8) questions of the following   **16**

(1) At what point or points in its path does a projectile have its minimum speed, its maximum speed.

(2) Explain the difference between (i) Elastic collision and (ii) In-elastic collision.

(3) State and derive second law of motion in terms of momentum.

(4) What is   (i) Ballistic missile   (ii) Ballistic Trajectory.

(5) Define angular velocity and give its formula.

(6) Prove that $a = r \propto$

(7) State the direction of the following vectors in simple situation

      (i) Angular momentum   (ii) Angular velocity.

(8) What is meant by moment of inertia? Explain its significance.

(9) Explain the effect of variation of density on the speed of sound in gas.

(10) Give the rules for the reflection of waves from the boundary of a (i) denser medium   (ii) rarer medium

(11) Explain why sound travels faster in warm air than in cold air?

(12) Is it possible for two identical waves travelling in the same direction along a string to give rise to a stationary wave ? Explain

QUESTION NO. 4 Write short answers any Six (6) questions of the following   **12**

(1) Can visible light produce the interference fringes ? Explain

(2) An oil film spreading over wet foot path show colours. Explain

(3) What are Newton's rings ? Explain briefly.

(4) Define resolving power and the magnification.

(5) If a person was looking through telescope at the full moon, how would the appearance of moon be changed by covering half of the objective lens?

(6) Internal energy is a state function. Explain

(7) Give two examples of the adiabatic process.

(8) Is it possible to construct a heat engine without sink ? Explain.

(9) Does entropy of a system increase or decrease due to friction ? Explain.

SECTION-II

Note: Attempt any Three questions from this section $8 \times 3 = 24$

5 (a) Define Molar specific heat at constant pressure and at constant volume and also derive relation between them. 5

(b) Calculate, how many seconds are there in one year and many years in one second? 3

6 (a) What is scalar product of two vectors ? Discuss its four characteristics. 5

(b) A truck weighing 2500 kg and moving with a velocity of $21\ ms^{-1}$ collides with a stationary car weighing 1000 kg.The truck and the car move together after the impact. Calculate their common velocity? 3

7 (a) Show that frequencies of stationary waves in a stretched string are quantized. 5

(b) A car of mass 800 kg travelling at 54 km/h is brought to rest in 60 meters. Find the average retarding force on the car. What has happened to original kinetic energy? 3

8 (a) Define centripetal force and derive its relation. 5

(b) A block of mass 4.0 kg is dropped from a height of 0.80 m on to a spring of spring constant $K = 1960\ Nm^{-1}$. Find the maximum distance through which the spring will be compressed 3

9 (a) Describe the construction of a simple microscope and derive an expression for its magnifying power. 5

(b) In a double slit experiment the second order maximum occurs at $\theta = 0.25°$. The wavelength is 650 nm. Determine the slit separation. 3

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