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Roll No. of Candidate : _____

PHYSICS **(Intermediate Part-I, Class 11th) 322 - (III)** **Paper I (Group – II)**

Time: 20 Minutes **OBJECTIVE ----- Code : 6476** GUJ-G322 **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. Attempt as many questions as given in objective type question paper and leave others blank.

1. 1 - Carnot engine is a _____ .

(A) real (B) ideal (C) both (A) & (B) (D) none of these

2 - The slope at any point on the velocity-time graph gives _____ .

(A) distance (B) acceleration (C) average velocity (D) average speed

3 - If the initial phase is $\frac{\pi}{2}$, the displacement of SHM is _____ .

(A) $x = x_o^2 \sin\omega t$ (B) $x = \sin\omega t$ (C) $x = x_o \cos\omega t$ (D) zero

4 - Radius of Geo-stationary satellite is _____ .

(A) 4.23×10^4 m (B) 4.23×10^4 km (C) 4.23×10^7 m (D) 4.23×10^3 m

5 - The speed of light in different medium is always _____ .

(A) equal to 'c' (B) different (C) greater than c (D) becomes zero

6 - Intensity of light depends upon _____ .

(A) wavelength (B) amplitude (C) velocity (D) frequency

7 - The value of 'g' at the centre of the earth is _____ .

(A) infinite (B) 2 g (C) 3 g (D) zero

8 - Dimensions of $\sqrt{\frac{F \times \ell}{m}}$ are _____ .

(A) $[M^0LT^{-1}]$ (B) $[ML^{-1}T]$ (C) $[ML^2T^{-3}]$ (D) $[ML^{-1}T^{-1}]$

9 - SI unit of molar specific heat are _____ .

(A) J mol^{-1} k^{-1} (B) J mol k^{-1} (C) J mol k (D) J mol^{-1}

10 - The ballistic missiles are only for _____ .

(A) short range (B) long range (C) zero range (D) none of these

11 - The value of constant ' γ ' for mono-atomic gas is _____ .

(A) 1.67 (B) 1.40 (C) 1.0 (D) 1.2

12 - If least count is 10 kg then 8.00×10^3 has significant digit _____ .

(A) 1 (B) 2 (C) 3 (D) 4

13 - The angle between rectangular components is _____ .

(A) 60^o (B) 90^o (C) 180^o (D) Zero

14 - Projection of $\vec{B}$ on $\vec{A}$ is _____ .

(A) A Cos θ (B) B Cos θ (C) A Sin θ (D) B Sin θ

15 - Gravity performs no work, if the body moves _____ .

(A) vertically (B) horizontally (C) 60^o vertical (D) none of these

16 - The droplet of water has terminal velocity the acceleration is _____ .

(A) maximum (B) minimum (C) zero (D) changed

17 - Speed of sound in copper is _____ .

(A) 38000 mS^{-1} (B) 3600 mS^{-1} (C) 3500 mS^{-1} (D) 3400 mS^{-1}

PHYSICS (Intermediate Part-I, Class 11th) 322 **Paper I** **(Group – II)**

Time: 2:40 Hours **SUBJECTIVE** **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. Give the draw backs to use period of a simple pendulum as a time standard.

ii. What are the dimensions and units of gravitational constant G in the formula $F = G\frac{m_1 m_2}{r^2}$?

iii. What are the three main frontiers of fundamental science?

iv. Differentiate between precise measurement and accurate measurement.

v. Can the velocity of an object reverse the direction when acceleration is constant? If so, give an example.

vi. An object is thrown vertically upward. Discuss the sign of acceleration due to gravity, relative to velocity, while the object is in air.

vii. What is velocity-time graph? What does its slope represent?

viii. A projectile is thrown horizontally from a height with velocity of 10 mS^{-1} and reaches the ground after 2 sec. Find the horizontal distance covered by the projectile.

ix. Calculate the entropy change when 1.0 kg of ice at $0\,^{o}C$ melts into water at $0\,^{o}C$. Latent heat of fusion of ice is $L_f = 3.36 \times 10^{5}\ J\,kg^{-1}$.

x. What happens to the temperature of the room, when an air conditioner is left running on a table in the middle of the room?

xi. Give an example of a natural process that involves an increase in entropy.

xii. 100 J of heat is supplied to a gas which increases its internal energy by 20 J. Find the work done by the system.

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

i. Define null vectors and equal vectors.

ii. Explain right hand rule to find the direction of vector product.

iii. Can a body rotate about its centre of gravity under the action of its weight?

iv. When rocket re-enters the atmosphere, its nose cone becomes very hot. Where does this heat energy come from?

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

vi. Name different sources of geothermal energy with brief discussion.

vii. What is meant by moment of inertia? Explain its significance.

viii. Show that orbital angular momentum $L_o = mvr$.

ix. What is the minimum orbital velocity for close orbiting satellite?

x. Write down the postulates of Huygens's principle.

xi. Can visible light produce interference fringes? Explain.

xii. Explain whether the Young's experiment is an experiment for studying interference or diffraction effects of light.

(Turn Over)

4. Write short answers to any SIX questions. GU S-G 2-22 **(2 x 6 = 12)**

i. Explain, how the swing is produced in a fast moving cricket ball?

ii. Show that in SHM the acceleration is zero when the velocity is greatest and the velocity is zero when the acceleration is greatest.

iii. What are damping devices? Give at least one example.

iv. If length of simple pendulum is increased four times, then what will be effect on its time period?

v. How are beats useful in tuning musical instruments?

vi. What features do longitudinal waves have in common with transverse waves?

vii. What is the frequency and wavelength of 3rd mode of stationary waves in closed organ pipe?

viii. Why would it be advantageous to use blue light with a compound microscope?

ix. How the light signal is transmitted through the optical fibre?

(SECTION – II)

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

5. (a) What is gravitational field? Show that gravitational field is conservative field. **(5)**

(b) The magnitude of dot and cross products of two vectors are $6\sqrt{3}$ and 6 respectively. Find the angle between the vectors. **(3)**

6. (a) State and explain law of conservation of linear momentum. **(5)**

(b) The earth rotates on its axis once a day. Suppose by some process the earth contracts so that its radius is only half as large as at present. How fast will it be rotating then? **(3)**

7. (a) What is meant by Doppler's effect? Discuss this effect for these two cases. **(5)**

i) An observer moving towards a stationary source of sound.

ii) Source of sound moving away from a stationary observer.

(b) What gauge pressure is required in the city mains for a stream from a fire hose connected to the mains to reach a vertical height of 15.0 meter? **(3)**

8. (a) What is simple pendulum? Show that its motion is SHM. Derive an expression for its time period. Also find its frequency. **(5)**

(b) A mono-chromatic light of $\lambda = 588$ nm is allowed to fall on a half silvered glass plate G_1 in Michelson interferometer. If mirror M is moving through 0.233 mm. How many fringes will be observed to shift? **(3)**

9. (a) State and explain carnot engine and carnot theorem in detail and how would you determine which fact makes carnot engine a superior one? **(5)**

(b) A telescope is made of an objective of focal length 20 cm and an eye piece of 5.0 cm, both convex lenses. Find the angular magnification. **(3)**