119

Total No. of Questions – 21

Total No. of Printed Pages – 2

Regd. No.

Part – III
PHYSICS, Paper-I
(English Version)

Time : 3 Hours]

[Max. Marks : 60

SECTION – A

$10 \times 2 = 20$

Note : (i)   Answer **all** questions.

(ii) Each question carries **two** marks.

(iii) **All** are very short answer type questions.

1.   What are fundamental forces in nature ?

2.   The error in measurement of radius of sphere is 1%. What is the error measurement of volume ?

3.   What is the acceleration of projectile at the top of its trajectory ?

4.   What happens to the co-efficient of friction if the weight of the body doubled ?

5.   Give the expression for the excess pressure in a soap bubble in air.

6.   What is the principle behind the carburettor of an automobile ?

7.   State Weins displacement law.

8.   Why gaps are left between rails on a railway track ?

9.   Define mean free path.

10. The absolute temperature of a gas is increased 3 times. What will be the increase in rms-velocity of the gas molecule ?

SECTION – B

Note : (i)   Answer any **six** questions.

(ii)   Each question carries **four** marks.

(iii)   **All** are short answer type questions.

11.   Show that the maximum height reached by a projectile launched at an angle of 45° is one quarter of its Range.

12.   If $\left|\vec{a} + \vec{b}\right| = \left|\vec{a} - \vec{b}\right|$, prove that the angle between $\vec{a}$ and $\vec{b}$ is 90°.

13.   Explain advantages and disadvantages of friction.

14.   Write equations of motion for a particle rotating about a fixed point.

15.   Define angular acceleration and torque. Establish relation between acceleration of angle (α) and torque.

16.   Derive relation between acceleration due to gravity at surface of a planet and Gravitational constant G.

17.   Define stress and explain types of stress.

18.   Pendulum clocks generally go fast in winter and slow in summer. Why ?

SECTION – C

Note : (i)   Answer any **two** questions.

(ii)   Each question carries **eight** marks.

(iii)   **All** are long answer type questions.

19.   State and prove law of conservation of energy in case of a freely falling body. A machine gun's 360 bullets fired per minute. Each bullet travels with a velocity of $600 \, ms^{-1}$. If the mass of each bullet is 5 gm, find the power of machine gun.

20.   Derive the equation for the Kinetic energy and potential energy of a simple harmonic oscillator and show that the total energy of a particle in simple harmonic motion is constant at any given point on its path.

21.   Explain reversible and irreversible process. Describe the working of Carnot Engine with equation.