119

III

Total No. of Questions : 21
Total No. of Printed Pages : 3

Regd. No. | | | | | | | | | | |

Part - III
PHYSICS, Paper - I
(English version)

Time : 3 Hours] ***[Max. Marks : 60***

SECTION - A **10×2=20**

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

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

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

1. State two physical quantities having their units as Pa.

2. If $\vec{F} = 3\vec{i} + 4\vec{j} + 5\vec{k}$ and $\vec{S} = 6\vec{i} + 2\vec{j} + 5\vec{k}$, find work done by the Force.

3. Define Poisson's ratio. State its theoretical limits.

4. The radius of a Mercury drop at 20°C is 3×10^{-3} m. If the surface tension of Mercury at this temperature is 4.65×10^{-1} Nm^{-1}, find the excess of pressure inside the liquid drop.

5. Distinguish between Stream-line and Turbulent flow of liquids.

6. At what temperature the readings on Celsius and Fahrenheit are similar ?

7. Can a substance contract on heating ? Give an example.

8. Distinguish between a Real gas and an Ideal gas.

9. State Zeroeth law of Thermodynamics. What is its significance ?

10. What is Kirchoff's law of Radiation and illustrate it with an example ?

SECTION - B

6×4=24

Note : *(i) Answer **ANY SIX** questions.*

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

(iii) All are Short answer type questions.

11. State Parallelogram law of Vectors. Derive an expression for the magnitude of resultant vector.

12. Show that time of ascent of a vertically projected body is equal to time of descent.

13. If a ball of mass 0.4 kg. moving with a velocity of 3 ms^{-1} collides elastically with another ball of mass 0.6 kg. which is at rest, find their velocities after collision.

14. Mention the characteristics of Centre of mass.

15. Why pulling the lawn roller is preferred than pushing the lawn roller ?

16. Define Angular Velocity. State its units and dimensions. State whether it is a Scalar (or) Vector.

17. What is a Geostationary Satellite ? Write any three uses.

18. A lump of Iron of mass 2 kg. is heated from 40°C to 1000°C. If the heat supplied is 192 K.cal., find its thermal capacity and specific heat of Iron.

SECTION - C

2×8=16

Note : *(i) Answer **ANY TWO** of the following questions.*

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

(iii) All are Long answer type questions.

19. State the law of conservation of energy and verify it in the case of a body projected vertically upwards.

A ball is projected vertically upwards from a ground with an initial velocity of $9.8\ ms^{-1}$. Find the maximum height reached by it using the law of conservation of energy.

20. Define Simple Harmonic Motion. Write an example.

What are the conditions for a particle to execute Simple Harmonic Motion ?

Obtain the equation of Simple Harmonic Motion of a particle, whose amplitude is 0.04 m, whose frequency is 50 Hz. and initial phase is $\pi/3$.

21. Define the coefficients of Real Expansion and Apparent Expansion of a liquid. Establish the relation between them.

The coefficient of real expansion of Mercury is 0.00018/°C. Find the coefficient of apparent expansion of Mercury in Glass (α for Glass is 0.000009/°C)