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 is physics ?

2. Express unified atomic mass unit in kg.

3. The vertical component of a vector is equal to its component horizontal. What is the angle made by the vector with X-axis ?

4. Can the coefficient of friction be greater than one?

5. What is angle of contact?

6. Give the expression for the excess pressure in a liquid drop ?

7. What is the latent heat of fusion?

8. State Wein's displacement law ?

9. State Boyles law and Charles law

10. Define mean free path.

SECTION – B

Note :   (i)   Answer *any six* questions.   **6 x 4 = 24**
           (ii)   Each question carries *four* marks.
           (iii) *All* are short answer type questions.

11. A ball is dropped from the roof of a tall building and simultaneously another ball is thrown horizontally with same velocity from the same roof. Which ball lands first ? Explain your answer.

12. Show that the maximum height and range of projectile are $\dfrac{U^2 \sin^2 \theta}{2g}$ and $\dfrac{U^2 \sin 2\theta}{g}$ respectively where the terms have their regular meanings.

13. Explain Advantages and disadvantages of friction.

14. Distinguish between centre of mass and centre of gravity.

15. Write the equations of motion for a particle rotating about a fixed axis?

16. State Kepler's laws of planetary motion.

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

18. Describe the behaviour of a wire under gradually increasing load.

SECTION – C

Note :   (i)   Answer *any two* questions.   **2 x 8 = 16**
           (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 fires 360 bullets per minute and each bullet travels with a velocity of $600 \, ms^{-1}$. If the mass of each bullet is 5 gm. Fing the power of a machine gun.

20. Define Simple Harmonic Motion. Show that the motion of (point) projection of a particle performing Uniform Circular motion on any diameter is simple harmonic. What is seconds pendulum?

21. State second law of thermodynamics. How is Heat Engine different from a refrigerator?