MODEL PAPER-3

Time : 3Hrs. **PHYSICS** **Max.Marks : 60**

SECTION - A

Answer all questions.

Each question carries 2 marks.

All are very short answer type questions. **$10 \times 2 = 20$ Marks.**

1. The moment of inertia of a fly wheel making 300 revolutions per minute is 0.3 kgm^2. Find torque required to bring it to rest in 20 s?
2. $\vec{A} = \vec{i} + \vec{j}$. What is the angle between the vector and x-axis?
3. Explain the concept of degrees of freedom for molecules of a gas.
4. What is the contribution of S. Chandrasekhar to Physics?
5. Why do we have different units for the same physical quantity?
6. What is Green House Effect? Explain Global Warming?
7. Why are drops and bubbles are spherical?
8. State the units and dimensions of universal gravitational constant (G)?
9. The bob of a simple pendulum is a hollow sphere filled with water. How will the period of oscillation change, if the water begins to drain out of the hollow sphere?
10. The states of motion and rest are relative. Explain?

SECTION - B

Answer any six questions.

Each question carries 4 marks.

All are short answer type questions. **6 ×4 = 24 Marks.**

11. What is a Geo Stationary satellite? State its uses?

12. Define Young's modulus, Bulk modulus and shear modulus.

13. Explain dynamic lift with examples.

14. Derive the expression $s = ut + \frac{1}{2}at^2$ by graphical method. The terms have their regular meaning.

15. Show that the trajectory of an object thrown at certain angle with the horizontal is a parabola.

16. Explain conduction, convection and radiation with Examples.

17. Why is pulling the lawn roller is preferred to pushing it?

18. The mass and radius of a planet are double that of the earth. If the time period of a simple pendulum on the earth is T, Find the time period on the planet.

SECTION - C

Answer any two of the following.

Each question carries 8 marks.

All are long answer type questions. **8 ×2 = 16 Marks.**

19. State Boyle's law and Charles' law. Hence derive ideal gas equation. Which of the two laws is better for the purpose of thermometry and why?

20. What are Collisions? Explain the possible the types of Collisions. Develop the theory of one dimensional elastic collisions.

21. State Bernoulli's principle. From conservation of energy in a fluid flow through a tube, derive Bernoulli's equation. Give an application of derive Bernoulli's theorem.