IPE Telangana 2023 Physics Paper I

(March)

Section – A

Answer ALL questions **10 x 2 = 20**

1. What is the contribution of S.Chandra Sekhar to Physics?
2. Can the coefficient of friction be greater than one?
3. When does a real gas behave like an ideal gas?
4. State Dalton's law of partial pressures.
5. How can systematic errors be minimized or eliminated?
6. Give the expression for the excess pressure in a liquid drop.
7. What is the principle behind the carburetor of an automobile?
8. Can a substance contract on heating? Give an example.
9. What is greenhouse effect? Explain global warming.
10. If $\overline{A} = \hat{i} + \hat{j}$. What is the angle between the vector and x-axis?

Section –B

Answer ANY SIX questions **6 x 4 = 24**

11. If $\left|\overline{a}+\overline{b}\right| = \left|\overline{a}-\overline{b}\right|$ prove that the angle between $\overline{a}$ and $\overline{b}$ is 90^o.
12. A ball is dropped from the roof of a tall building and simultaneously another ball is thrown horizontally with some velocity from the same roof. Which ball lands first ? Explain your answer.
13. Explain advantages and disadvantages of friction.
14. Distinguish between centre of mass and centre of gravity.
15. Define angular acceleration and torque. Establish the relation between angular acceleration and torque.
16. What is orbital velocity? Obtain an expression for it.
17. Define Young's modulus, Bulk modulus and Shear modulus.
18. Pendulum clocks generally go fast in winter and slow in summer. Why?

Section –C

Answer ANY TWO questions **2 x 8 = 16**

19. What are collisions? Explain the possible types of collisions? Develop the theory of one dimensional elastic collision.

20. Show that the motion of a simple pendulum is simple harmonic and hence derive an equation for its time period. What is seconds pendulum?

21. State second law of thermodynamics. How is heat engine different from a refrigerator?

Note:

- The questions are obtained from internet and from the students from their interaction for paper discussion after the examination.
- The questions are given here only for ready reference for the students for preparation for upcoming examinations