IPE Telangana 2024 (May) Physics Paper

Section – A

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

1. What is the contribution of S Chendra Sekhar to Physics?
2. Distinguish between fundamental units an derived units.
3. When two right angled vectors of magnitude 7 units and 24 units combine, what is the magnitude of their resultant?
4. If a bomb at rest explodes into two pieces, the pieces must travel in opposite directions. Explain.
5. Why are drops and bubbles spherical?
6. State Wien's displacement law.
7. What is Magnus effect?
8. What are the lower and upper fixed points in Celsius and Fahrenheit scales?
9. Absolute temperature of a gas is increased 3 times. What will be the increase in rms velocity of the gas molecule?
10. State Boyle's law and Charles's law.

Section –B

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

11. Show that the trajectory of an object thrown at a certain angle with the horizontal is a parabola.
12. A parachutist flying in an aeroplane jumps when it is at a height of 3km above the ground. He opens his parachute when he is about 1km above the ground. Describe his motion.
13. Mention the methods used to decrease friction.
14. Define angular acceleration and torque. Establish the relation between angular acceleration and torque.
15. Define vector product. Explain the properties of a vector product with two examples.
16. What is escape velocity? Obtain an expression for it.

17. Describe the behavior of a wire under gradually increasing load.

18. In what way is the anomalous behaviour of water advantageous to aquatic animals?

Section –C

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

19. State and prove the 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 grams then find the power of the 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.

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