MODEL PAPER - 2

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. State the units and dimensions of modulus of elasticity.
2. What are water proofing agents and water wetting agents? What do they do?
3. The absolute temperature of a gas is increased by 3 times. What will be the increase in rms velocity of the gas molecule?
4. What are the fundamental forces in Nature?
5. Distinguish between fundamental units and derived units.
6. Define coefficient of thermal conductivity and temperature gradient.
7. A pump is required to lift 600kg of water per minute from a well 25m deep and to eject it with a speed of $50ms^{-1}$. Calculate the power required to perform the above task?
8. If the polar ice caps of the earth were to melt, what would the effect of the length of the day be?
9. What would be the change in acceleration due to gravity (g) at the surface, if the radius of the earth decreases by 2%, keeping the mass of the earth constant ?
10. Can the coefficient of friction be greater than one?

SECTION - B

Answer Any six questions.

Each question carries 4 marks.

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

11. What is escape velocity? Obtain expression for it?

12. Define strain energy and derive the equation for the same.

13. What is Venturimeter? Explain how it is used?

14. Can the velocity of an object be in a direction other than the direction of acceleration of the object? If so, give an example?

15. Define unit vector, null vector and position vector.

16. In what way is the anomalous behavior of water advantageous to aquatic animals?

17. Explain advantages and disadvantages of Friction.

18. Compare isothermal Process and adiabatic Process.

SECTION - C

Answer any two of the following.

Each question carries 8 marks.

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

19. Define angle of friction and angle of repose.

    Show that angle of friction is equal to angle of repose for a rough inclined plane.

    A block of mass 4kg is resting on a rough horizontal plane and is about to move when a horizontal force of 30 N is applied on it. If g = 10 ms^{-2} find the total contact force exerted by the plane on the block.

20. State the law of conservation of energy and verify in the case of a freely falling body. What are the conditions under which the law of conservation of energy is applicable?

21. Explain reversible and Irreversible Processes.

Describe the working of a Carnot engine. Obtain the expression for efficiency.