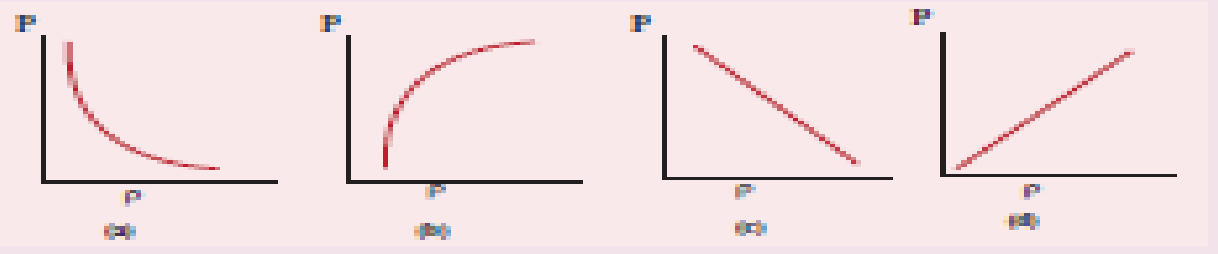
CLASS: 11 **II-50%** **TIME: 3.00**
SUB: PHYSICS **MARKS: 70**

I.CHOOSE THE CORRECT ANSWER **15X1=15**

1. The unit of gravitational field is ……
   a) N/kg b)Nkg c) ms^{-1} d) m/s^{-2}
2. Which of the following is not a scalar?
   (a) Viscosity (b) surface tension (c) pressure (d) stress
3. The linear momentum and position vector of the planet is perpendicular to each other at
   (a) Perihelion and aphelion (b) at all points (c) only at perihelion (d) no point
4. When a cycle tyre suddenly bursts, the air inside the tyre expands. This process is….
   a) Isothermal b) adiabatic c) isobaric d) isochoric
5. Which of the following shows the correct relationship between the pressure and density of an ideal gas at constant temperature?



6. Which of the following represents a wave?
   (a) (x - vt) 3 (b) x(x+vt) (c) 1/ (x+vt) (d) sin(x+vt)
7. Which one of the following represents simple harmonic motion?
   a) Acceleration= -kx b) acceleration=k0+kx2 c) acceleration= -k(x+a) d) acceleration= (x+a)
8. The wavelength of a sine waves is λ = 1m. Calculate the wave number
   a) 6.28 rad m^{-1} b) 62.8 rad m^{-1} c) 628.0 rad m^{-1} d) 0. 628 rad m^{-1}]\
9. The wave produced by a motor boat sailing in water is
   a) Transverse b) longitudinal c) stationary d) longitudinal and transverse
10. The earth (mass=6×10^{24} kg) revolves around the sun with an angular velocity 2×10^{-7} rad/sec in a circular orbit of radius 1.5×10^{8} km. The force exerted by sun on earth in newton is ……
    a)36×10^{21} b) 18×10^{25} c)29×10^{39} d)zero
11. The angle of contact between pure water and pure glass is….
    a) 0° b) 45° c) 90° d) 1350°
12. When there is no heat exchange from surrounding to a system, then the process is related with…….
    a) Isobaric b) isochoric c) isothermal d) adiabatic
13. Energy of simple harmonic motion depends upon…..
    a) $1/\omega^2$ b) ω c)a^2 d)$1/ a^2$
14. Which of the following statement is correct?
    a) Hook's law is applicable only within elastic limit b) The adiabatic and isothermal elastic constant of gas is equal c) Young's modulus is dimensionless d) Stress multiplied by strain is equal to the stored energy
15. A sound wave whose frequency is 5000 Hz travels in air and then hits the water surface. The ratio of its wavelengths in water and air is…….. a) 4.30 b) 0.23 c) 5.30 d) 1.23

II. ANSWER ANY 6 QUESTIONS AND Q.NO.20 IS COMPULSORY **6X2=12**

16. What are the factors effecting Brownian motion?
17. If earth has no tilt, what happens to the seasons of earth?
18. Write any two differences between transverse and longitudinal waves.
19. Which one of these is more elastic, steel or rubber? Why?
20. If the length of the simple pendulum is increased by 44% from its original length, calculate the percentage increase in time period of the pendulum.
21. Define specific heat capacity and give its unit.
22. What is Reynolds's number? Give its significance.
23. Explain Doppler Effect.
24. Explain damped oscillation. Give an example.

III. ANSWER ANY 6 QUESTIONS AND Q.NO.32 IS COMPULSORY. 6X3=18

25. State kepler's Laws.
26. Explain the working of refrigerator.
27. State Laws of Transverse Vibrations in Stretched Strings
28. An oxygen molecule is travelling in air at 300 K and 1 atm, and the diameter of oxygen molecule is $1.2 \times 10{-}10m$. Calculate the mean free path of oxygen molecule.
29. Comparison between progressive and stationary waves
30. What is meant by end correction in resonance air column apparatus?
31. Explain the vertical oscillations of a spring.
32. Two pistons of a hydraulic lift have diameters of 60 cm and 5 cm. What is the force exerted by the larger piston when 50 N is placed on the smaller piston?
33. State the law of floatation

IV. ANSWER ALL QUESTIONS 5X5=25

34.a) Explain the variation of g with latitude. (or)
b) Derive the time period of satellite orbiting the Earth.
35. a) Explain in detail Newton's law of cooling. (or)
b) Explain Calorimeter and derive an expression for final temperature when two thermodynamic systems are mixed.
36. a) Discuss in detail the energy in simple harmonic motion. (or)
b) Write down the difference between simple harmonic motion and angular simple harmonic motion.
37. a) State and prove Bernoulli's theorem for a flow of incompressible, non-viscous, and streamlined flow of fluid. (or)
b) What are stationary waves? Explain the formation of stationary waves and also write down the characteristics of stationary waves.
38. a) Derive the ratio of two specific heat capacities of monoatomic, diatomic and triatomic molecules (or)
b) Write down the postulates of kinetic theory of gases

……..Don't let yesterday take up too much of today……