



M M A HIGHER SECONDARY SCHOOL-PAPPANADU

STD:XI

VOLUME-2 MODEL QUESTION PAPER

TIME:3.00 HOURS

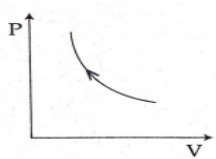
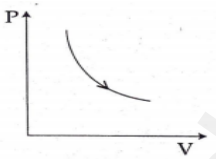
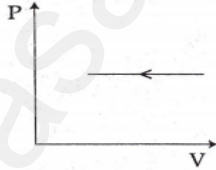
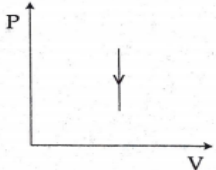
SUB: PHYSICS

(UNIT:6-11)

MARKS:70

I) CHOOSE THE CORRECT ANSWER:

15×1=15

- The wettability of a surface by a liquid depends primarily on
 - viscosity
 - surface tension
 - density
 - angle of contact between the surface and the liquid
- Which of the following represents a wave
 - $(x-vt)^3$
 - $\sin(x+vt)$
 - $1/(x+vt)$
 - $x(x+vt)$
- If the masses of the Earth and Sun suddenly double, the gravitational force between them will
 - remain the same
 - increase 2 times
 - increase 4 times
 - decrease 2 times
- The efficiency of a heat engine working between the freezing point and boiling point of water is
 - 6.25%
 - 12.5%
 - 20%
 - 26.8%
- The average translational kinetic energy of gas molecules depends on
 - number of moles and T
 - only on T
 - P and T
 - P only
- The process in which heat transfer is by actual movement of molecules in fluid such as liquid and gases is called
 - Thermal conductivity
 - convection
 - Conduction
 - Radiation
- A mass of 3 kg is attached at the end of a spring moves with simple harmonic motion on a horizontal frictionless table with time period 2π and with amplitude of 2m, then the maximum force exerted on the spring is
 - 1.5 N
 - 3 N
 - 6 N
 - 12 N
- Which of the following P-V diagrams corresponds to isobaric compression?
 - 
 - 
 - 
 - 

9. Copper of fixed volume V is drawn into a wire of length l . When this wire is subjected to a constant force F , the extension produced in the wire is Δl . If Y represents the Young's modulus, then which of the following graphs is a straight line?

- Δl versus V
- Δl versus F
- Δl versus Y
- Δl versus $1/l$

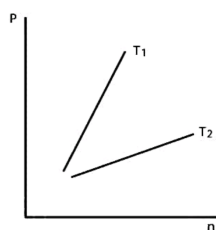
10. The SI unit of gravitational potential is

- kg/Joule
- Joule/kg²
- Joule/kg
- Joule²/kg

11. A transverse wave moves from a medium A to a medium B. In medium A, the velocity of the transverse wave is 500 ms^{-1} and the wavelength is 5 m. The frequency and the wavelength of the wave in medium B when its velocity is 600 ms^{-1} , respectively are

- 100 Hz and 5 m
- 120 Hz and 5 m
- 100 Hz and 6 m
- 120 Hz and 6 m

12. The following graph represents the pressure versus number density for ideal gas at two different temperatures T_1 and T_2 . The graph implies



- $T_1 = T_2$
- $T_1 < T_2$
- $T_1 > T_2$
- Cannot be determined

13. Which of the following is not a scalar?

- viscosity
- stress
- pressure
- surface tension

14. What is the complete audible frequency range for a human ear?

- 20 to 25,000 Hz
- 30 to 30,000 Hz
- 20 to 20,000 Hz
- 60 to 60,000 Hz



15. The time period of simple harmonic motion depends upon the
a) amplitude b) energy c) phase constant d) mass

II) ANSWER ANY SIX QUESTIONS:Q.NO:24 IS COMPULSORY:

6×2=12

16. State Zeroth law of thermodynamics.
17. Will the angular momentum of a planet be conserved? Justify your answer.
18. Define Doppler Effect.
19. Define Poisson's ratio.
20. Why moon has no atmosphere?
21. State the laws of simple pendulum
22. A mobile phone tower transmits a wave signal of frequency 900MHz. Calculate the length of the waves transmitted from the mobile phone tower.
23. Write any two applications of viscosity.
24. A refrigerator has COP of 3. How much work must be supplied to the refrigerator in order to remove 200 J of heat from its interior?

III) ANSWER ANY SIX QUESTIONS:Q.NO:33 IS COMPULSORY:

6×3=18

25. Explain in detail Newton's law of cooling.
26. Discuss the law of transverse vibrations in stretched strings.
27. Derive an expression for the elastic energy stored per unit volume of a wire.
28. An oxygen molecule is travelling in air at 300 K and 1 atm, and the diameter of oxygen molecule is 1.2×10^{-10} m. Calculate the mean free path of oxygen molecule.
29. State Kepler's three laws.
30. Briefly explain the difference between travelling waves and standing waves.
31. Write any six postulates of kinetic theory of gases.
32. Explain resonance. Give an example.
33. A metal plate of area $2.5 \times 10^{-4} \text{ m}^2$ is placed on a $0.25 \times 10^{-3} \text{ m}$ thick layer of castor oil. If a force of 2.5 N is needed to move the plate with a velocity $3 \times 10^{-2} \text{ m s}^{-1}$, calculate the coefficient of viscosity of castor oil.

IV) ANSWER ALL THE QUESTIONS:

5×5=25

34. (a) Derive Poiseuille's formula for the volume of a liquid flowing per second through a pipe under streamlined flow. [OR]
(b) Derive the work done in an adiabatic process.
35. (a) Derive the ratio of two specific heat capacities of monoatomic, diatomic and triatomic molecules. [OR]
(b)(i) Explain the variation of g with altitude.
(ii) If a mango of mass $\frac{1}{2} \text{ kg}$ falls from a tree from a height of 15 meters, what is the acceleration due to gravity when it begins to fall? ($g=9.8 \text{ ms}^{-2}$, $R_e=6400 \times 10^3 \text{ m}$)
36. (a) Discuss in detail the energy in simple harmonic motion. [OR]
(b) State and prove Bernoulli's theorem for a flow of incompressible, non-viscous, and streamlined flow of fluid.
37. (a) Derive an expression for escape speed. [OR]
(b) Show that the velocity of a travelling wave produced in a string is $v=\sqrt{T/\mu}$
38. (a) Derive Mayer's relation for an ideal gas. [OR]
(b) Describe Newton's formula for velocity of sound waves in air and also discuss the Laplace's correction.

Prepared by: M.Tamizharasan.M.Sc.,B.Ed.,
PGT in physics,
M M A Hr Sec School- Pappanadu,
Thanjavur dt.

