

Class : 11

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**SECOND MID TERM TEST - 2024**

Time Allowed : 1.30 Hours]

**PHYSICS**

[Max. Marks : 50

PART - I

YouTube/ Akwa Academy

Answer all the questions

10x1=10

- The wettability of a surface by a liquid depends primarily on  
(a) viscosity (b) surface tension (c) density  
(d) angle of contact between the surface and the liquid
- If the temperature of the wire is increased, then the Young's modulus will  
(a) remain the same (b) decrease  
(c) increase rapidly (d) increase by very a small amount
- With an increase in temperature, the viscosity of liquid and gas, respectively will  
(a) increase and increase (b) increase and decrease  
(c) decrease and increase (d) decrease and decrease
- If a wire is stretched to double of its original length, then the strain in the wire is  
(a) 1 (b) 2 (c) 3 (d) 4
- Relation between the radius of the liquid drop and the excess pressure inside the liquid drop is \_\_\_\_\_  
(a) Directly proportional (b) Inversly proportional  
(c) Inversly proportional to square of radius (d) None of these
- A distant star emits radiation with maximum intensity at 350 nm. The temperature of the star is  
(a) 8280 K (b) 5000 K (c) 7260 K (d) 9044 K
- The efficiency of a heat engine working between the freezing point and boiling point of water is  
(a) 6.25% (b) 20% (c) 26.8% (d) 12.5%
- When a uniform rod is heated, which of the following quantity of the rod will increase  
(a) mass (b) weight (c) center of mass (d) moment of inertia
- In hot summer after a bath, the body's  
(a) internal energy decreases (b) internal energy increases  
(c) heat decreases (d) no change in internal energy and heat
- Equation of state for an Ideal gas is \_\_\_\_\_  
(a)  $PV = \mu RT$  (b)  $PV = 2 \mu RT$  (c)  $PV = \frac{1}{3} \mu RT$  (d)  $PV = \frac{1}{\mu RT}$

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## PART - II

II. Answer any Five questions. Question no.14 is compulsory.

5x2=10

11. Define stress and strain.
12. State Pascal's law in fluids.
13. What is Reynold's number? Give its significance.
14. During a cyclic process, a heat engine absorbs 500 J of heat from a hot reservoir, does work and ejects an amount of heat 300 J into the surroundings (cold reservoir). Calculate the efficiency of the heat engine?
15. Define latent heat capacity. Give its unit.
16. What is an equation of state? Give an example.
17. List the factors affecting the mean free path.

## PART - III

III. Answer any five questions in which question No. 24 is compulsory

5X3 =15

18. Explain the different types of modulus of elasticity.
19. Write the Applications of viscosity.
20. State the principle and working of Venturimeter.
21. Discuss various modes of heat transfer.
22. Explain in detail the isochoric process.
23. What are the factors affecting the surface tension of a Liquid?
24. A 0.5 mole of gas at temperature 300 K expands isothermally from an initial volume of 2 L to 6 L.
  - (a) What is the work done by the gas?
  - (b) What is the final pressure of the gas? ( $R = 8.31 \text{ J mol}^{-1} \text{ K}^{-1}$ )

## PART - IV

IV. Answer all the Questions:

3x5=15

25. (a) Derive the expression for the terminal velocity of a sphere moving in a high viscous fluid using stokes force.  
(OR)  
(b) Explain in detail Newton's law of cooling.
26. (a) Drive Mayer's relation for an ideal gas  
(OR)  
(b) Derive the expression for mean free path of the gas.
27. (a) Write down the postulates of kinetic theory of gases and What are factor affecting Brownian motion.  
(OR)  
(b) State and prove Bernoulli's theorem for a flow of incompressible, non-viscous, and streamlined flow of fluid.

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