

PM SHRI KENDRIYA VIDYALAYA SITAPUR (FIRST SHIFT)

Unit Test – 2

Class – XI

Subject – Physics

Time – 90 minutes

M.M. – 40

Section – A (1 Mark Each)

Q.1) The SI unit of coefficient of viscosity is -

- (a) Nm/s (b) Nms² (c) Nm²/s (d) N/m²s⁻¹

Q.2) A steel ball is dropped in oil, then -

- (a) the ball attains constant velocity after some time (b) the ball stops
(c) the speed of ball will keep on increasing (d) none of the above

Q.3) The ratio of the terminal velocities of two drops of radii R and R/2 is -

- (a) 2 (b) 4 (c) 1/2 (d) 1/4

Q.4) If a liquid does not wet glass then its angle of contact will be -

- (a) zero (b) acute (c) obtuse (d) right angle

Q.5) Bernoulli's principle is based on the law of conservation of -

- (a) energy (b) mass (c) linear momentum (d) angular momentum

Q.6) Excess pressure inside a soap bubble of radius (r) is proportional to -

- (a) r (b) 1/r (c) r² (d) 1/r²

Q.7) If the liquid neither rises nor falls in a capillary tube, then angle of contact is -

- (a) 0° (b) 45° (c) 90° (d) 180°

Q.8) For different capillaries of radius (r), the condition of liquid rise (h) above the liquid surface is -

- (a) hr = constant (b) h/r = constant (c) h + r = constant (d) h - r = constant

Q.9) If boiling point of a liquid is 95° F, what will be the reading at celsius scale ?

- (a) 7° C (b) 35° C (c) 63° C (d) 65° C

Q.10) According to Wien's law -

- (a) $\lambda_m T = \text{constant}$ (b) $\lambda_m / T = \text{constant}$ (c) $\lambda_m \sqrt{T} = \text{constant}$ (d) $\lambda_m / \sqrt{T} = \text{constant}$

Q.11) A quantity of heat required to change the unit mass of a solid substance, from solid state to liquid state while the temperature remains constant is known as -

- (a) latent heat of fusion (b) latent heat of vaporisation (c) sublimation (d) specific heat capacity

Q.12) Which of the following parameter does not characterize the thermodynamic state of matter ?

- (a) temperature (b) pressure (c) volume (d) work

Q.13) Universal gas constant (R) is equal to -

- (a) Cp/Cv (b) Cv/Cp (c) Cp + Cv (d) Cp - Cv

- Q.14) During isothermal expansion, a confined ideal gas does + 150 J of work against its surroundings. This implies that -
- (a) 150 J of heat has been removed from the gas
 - (b) 150 J of heat has been added to the gas
 - (c) 300 J of heat has been added to the gas
 - (d) no heat is transferred because the process is isothermal

Assertion – Reason Type Questions

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
- (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
- (c) Assertion (A) is true but Reason (R) is false.
- (d) Both Assertion (A) and Reason (R) are false.

Q.15) **Assertion (A) : In an adiabatic process, change in internal energy is equal to work done on gas.**

Reason (R) : In adiabatic process no heat exchange occurs with surrounding.

Q.16) **Assertion (A) : Air at some distance above the fire is hotter than the same distance below it.**

Reason (R) : Air surrounding the fire carries heat upwards.

Section – B (2 Marks Each)

- Q.17) Explain the working of hydraulic lift.
- Q.18) Define latent heat of fusion and latent heat of vaporisation.

Section – C (3 Marks Each)

- Q.19) State the factors on which the conduction of heat through a substance depends. Obtain an expression for the heat conducted and hence define coefficient of thermal conductivity and write its units and dimensions.
- Q.20) Derive an expression for the work done during the isothermal expansion of an ideal gas.

Section – D (5 Marks Each)

- Q.21) What is an ideal fluid ? State and prove Bernoulli's theorem.
- Q.22) Define surface tension. Derive an expression for the excess pressure inside a soap bubble.

Section – E (4 Mark)

Case Study

A thermodynamic process is said to occur if the thermodynamic variables of a system undergo a change with time. Different types of thermodynamic processes are as follows :

Isothermal, Isobaric, Isochoric and Adiabatic

- Q.23) Read the above paragraph carefully and answer the following questions.
- a) Define isothermal process.
 - b) Define isobaric process.
 - c) Define Isochoric process.
 - d) Define adiabatic process.