Model Question Paper 2

Heat and Thermodynamics 2

11th Standard

Physics

Reg.No. : | | | | | | |

Answer all the Questions

Time : 00:50:00 Hrs

Total Marks : 45

Part A

5 x 1 = 5

1) The translational kinetic energy of gas molecules for one mole of the gas is equal to_____

   (a) $\frac{3}{2}RT$ (b) $\frac{2}{3}KT$ (c) $\frac{1}{2}RT$ (d) $\frac{3}{2}KT$

2) The internal energy of a perfect gas is ____

   (a) partly kinetic and partly potential (b) wholly potential (c) wholly kinetic (d) depends on the ratio of two specific heats

3) A refrigerator with its power on is kept in a closed room. The temperature of the room will _____

   (a) rise (b) fall (c) remains the same (d) depend on the area of the room

4) A beaker full of hot water is kept in a room. If it cools from 80^oC to 75^oC in t_1 minutes, from 75^oC to 70^oC in t_2 minutes and from 70^oC to 65^oC in t_3 minutes, then_____

   (a) $t_1=t_2=t_3$ (b) $t_1< t_2 = t_3$ (c) $t_1< t_2 < t_3$ (d) $t_1> t_2 > t_3$

5) Which of the following will radiate heat to the large extent?

   (a) white polished surface (b) White rough surface (c) Black polished surface (d) Black rough surface

Part B

5 x 2 = 10

6) Define molar specific heat at constant pressure.

7) Derive Meyer's relation.

8) What is an indicator diagram?

9) On driving a scooter for a long time the air pressure in the tyre slightly increases why?

10) Is it possible to increase the temperature of a gas without the addition of heat? Explain.

Part C

5 x 3 = 15

11) The ratio of radiant energies radiated per unit surface area by two bodies is 16:1.The temperature of the hotter body is 100 K.Calculate the temperature of the other body.

12) A hot solid takes 10 minutes to cool from 60^0 C to 50^0 C.How much will further time it take to cool to 40^0C if the room temperature is 20^0C?

13) What is Avogadro's number?

14) Define temperature

15) Define specific heat capacity

Part D

3 x 5 = 15

16) Calculate the kinetic energy of translational motion of a molecule of a diatomic gas at 320K.

17) Calculate the RMS velocity of hydrogen molecules at NTP (One mole of hydrogen occupies 22.4 litres at NTP).

18) The RMS speed of dust particles in air at NTP is 2.2×10^{-2} m s^{-1} .find the average mass of the particles.

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