
Test [Heat and Thermodynamics]

Duration 90 minutes

Marks 30

- Q.1 Which of the two specific heats of gases is greater and why? [2]
- Q.2 In hilly areas water pipes bursts during winters. What can be the reason for it? [2]
- Q.3 Can the temperature of the system be increased without heating it? Can a heat be added to the system without increasing its temperature? [3]
- Q.4 What will be specific heat of water during [a] boiling process and [b] melting process? [2]
- Q.5 Derive the relation for work done to change the volume of the gas from V_1 to V_2 in an isothermal expansion of the gas at temperature T ? [4]
- Q.6 Derive the relation between specific heat of the gas at constant pressure and specific heat of the gas at constant volume. [4]
- Q.7 A refrigerator whose coefficient of performance is 5 extracts heat from the cooling compartment at the rate of 250J per cycle. [a]how much work per cycle is required to operate the refrigerator cycle? [b]How much heat per cycle is discharged to the room which acts as the high temperature reservoir? [4]
- Q.8 What are the major limitations of first law of thermodynamics? [3]
- Q.9 Write the equation for first law of thermodynamics for melting and boiling process [3]
- Q.10 A tyre is pumped to a pressure of 3 atmosphere, suddenly bursts. Calculate the fall in temperature if the temperature of the air before expansion is 27°C and $\gamma=1.4$. [3]