

(8)

(b) State and prove law of equipartition of energy.

3 1/2

T peek kea meceetlelej Ce kea emeaeelle keas yeeFS emeae keaapeS-

(5)

uee[& keaduJee TelLee keaieedmeJeme kea G<ceieellkeaaer kea omej : efreJee kea keaLeve keas yeeFS- ebKeeFS eka oseeellkealeve meceetlelej n@

(b) Describe Carnot cycle and obtain expression for its efficiency. What is Carnot theorem?

3 1/2

keaveex Ueaa kea efreJee Ce oapeS TelLee Fmekeaar kea JUpkeaa Dehle keaapeS- keaveex emeaeelle kelee n@

5. (a) What is physical significance of entropy? Give its units? Why unavailable energy of universe tends to increase?

4

SCSheer kea kelee Yeeellkeaa cenIJe n@ Fmekeaar oapeS- yeSyeel keaer Dehle GpeekaleelWye[ves keas GAete j nIeer n@

(b) Prove

$$C_p - C_v = -TE\alpha^2V$$

Where E is bulk modulus at constant temperature and α is coefficient of volume expansion.

3 1/2

emeae keaapeS -

$$C_p - C_v = -TE\alpha^2V$$

penaE efreJee leeh hej Deuleve DeUemLelee iefceka n Deej α Deuleve Deeej iefceka n@

(6)

Unit-III / FkæF-III

7½

6. What do you understand by the Joule Thomson effect? Obtain an expression for the Joule Thomson Coefficient on the basis of the laws of thermodynamics. What is importance of this effect from the point of view of liquefaction of gases?

petue-Leecemeve ðeYeJe mes Deche keðee mecePeles nQ T < ceieedl ekeær keå eðeJeeceWkeå DeDeej hej petue-Leecemeve ieGeeå keåe JÙeðekeå ðeehe keåeðeS- iemeelWkeå ðJeekeåCe ceWfmekeåe keðee cenIJe nQ

7. (a) Discuss in detail the properties of He-I and He-II 4

He-I leee He-II keå ieGeeWkeær eðemleej mes eðeeðeevee keåeðeS-

(b) Write explanatory note on liquefaction of gases. 3½

iemeelWkeå ðJeekeåCe hej JÙeeKÙeeI cekeå eðheCeer eðeeKeeS-

Unit-IV / FkæF-IV

8. Obtain expression for mean free path of gas molecules. How does it depend on density,

(7)

temperature and pressure?

The diameter of the molecule of a gas is 2×10^{-8} Cm and Boltzmann's constant is 1.38×10^{-23} J/K . Calculate the mean free path at N.T.P. 7½

ieme DeCeðeeWkeå Deemele mJeeðee heLe keå eðeeS JÙeðekeå ðeehe keåeðeS- ðen leeeJe, leee Deej oeye hej ekeåme ekeåej eðeeðee keåeðeS-

ekeåmeer ieme DeCeGkeåe JÙeeme 2×10^{-8} Cm nWleLee yeessðeeceve eðeeðeekeå 1.38×10^{-23} J/K nW Deemele mJeeðee heLe keåe N.T.P. hej ieCevee keåeðeS-

9. (a) Draw graph showing the distribution of energy with the wavelength in the energy emitted by a black body at different temperatures. What important results are obtained from these graphs? 4

Skeå keåeCkeåe Éeje eðeeðeeve leeeheðeej GImeeðee Gpeekkeåe, Gpeeklejeðeeðee eðeeðee keåeðeS- Fve eðeeðeeWÉeje keðee cenIJeheCe&meðeeveeSb eðeeveer nQ