

- Q.28 Give kelvin plank statement of second law of thermodynamics.
- Q.29 An inverter claims to have developed a power cycle of developing a net work output of 410 kJ for an energy input by heat transfer of 1000 kJ. The system undergoing the cycle receives the heat transfer from hot gases at a temperature of 500K and discharge energy by heat transfer to the atmosphere at 300K. Evaluate the claim.
- Q.30 Define thermodynamic third law.
- Q.31 Discuss absorption refrigeration cycle.
- Q.32 Write the Quasi-static process with the help of neat diagram.
- Q.33 What is Joule's Experiment.
- Q.34 Calculate the entropy change for isothermal mixing process.
- Q.35 Discuss commonly used refrigeration cycle.

SECTION-D

- Note:** Long answer type questions. Attempt any two questions out of three questions. $2 \times 10 = 20$
- Q.36 Explain the working principle and coefficient of performance of heat pump with help of neat diagram.
- Q.37 Write the isochoric process, isobaric process and adiabatic process with suitable example.
- Q.38 Define vapour compression cycle with the help of neat Diagram.

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4th SEM / Chemical Engineering Subject : Chemical Engineering Thermodynamics

Time : 3 Hrs.

M.M. : 100

SECTION-A

- Note:** Multiple choice questions. All questions are compulsory (10x1=10)
- Q.1 The unit of energy in S.I. units is
a) watt b) joule
c) joule/s d) joule/m
- Q.2 According to Dalton's law, the total pressure of the mixture of gases is equal to
a) greater of the partial pressure of all
b) sum of the partial pressures of all
c) average of the partial pressures of all
d) atmospheric pressure
- Q.3 Intensive property of a system in one whose value
a) is not dependent on the path followed but on the state
b) does not depend on the mass of the system
c) depends of the mass of the system
d) is dependent on the path followed and not on the state
- Q.4 Work done in a free expansion process is
a) +ve b) -ve
c) maximum d) zero

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- Q.5 The unit of temperature in S.I units is
 a) Centigrade b) Kelvin
 c) Fahrenheit d) Celsius
- Q.6 The unit of power in S.I units is
 a) newton b) pascal
 c) erg d) watt
- Q.7 The statement that molecular weights of all gases occupy the same volume is known as
 a) Avogadro's hypothesis
 b) Dalton's law
 c) Gas law
 d) Law of thermodynamics
- Q.8 Which of the following laws is applicable for the behaviour of a perfect gas
 a) Boyle's law b) Charle's law
 c) None d) a and b
- Q.9 Temperature of a gas is produced due to
 a) its heating value
 b) attraction of molecule
 c) repulsion of molecules
 d) kinetic energy of molecules
- Q.10 The unit of pressure in S.I units is
 a) kg/cm^2
 b) mm of water column
 c) pascal
 d) dynes per square cm

SECTION-B

Note: Objectives type questions. All questions are compulsory. 10x1=10

- Q.11 Define open system.

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- Q.12 Describe Extensive property.
 Q.13 What is State functions.
 Q.14 Discuss Thermodynamic equilibrium.
 Q.15 What is pressure.
 Q.16 Write Internal Energy.
 Q.17 What is unit of entropy.
 Q.18 Define Henry's law.
 Q.19 What is Raoult's law.
 Q.20 Write Vander-waal's equation.

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. 12x5=60

- Q.21 Define Systems and surrounding with suitable example.
 Q.22 Describe the reversible process with suitable example.
 Q.23 Water flows over a waterfall 100m in height. Take 1kg of the water as system and assume that it does not exchange energy with the surrounding. What is the kinetic energy of water just before it strikes the bottom?
 Q.24 Calculate the work done by the system at isobaric, isochoric process and isothermal process?
 Q.25 Describe first law of thermodynamics with equation.
 Q.26 Define Carnot cycle with help of diagram.
 Q.27 Discuss limitation of first law and state.

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