

- Q.30 Convert 728 Btu/ft²hr°F into watt/m²K
- Q.31 A mixture of H₂ and O₂ contains 11.1% H₂ by weight . Calculate average molecular weight of gas mixture.
- Q.32 Briefly list the steps of procedure for carrying out energy balance problems
- Q.33 Define Raoult's Law
- Q.34 Write short note on theoretical air requirement and excess air
- Q.35 Define sensible heat and latent heat

SECTION-D

- Note:** Long answer type questions. Attempt any two questions out of three questions. (2x10=20)
- Q.36 Prove that for ideal gaseous mixture, Mole% = Pressure% = Volume %
- Q.37 A feed to a continuous fractionating column analyses 28% benzene and 72% toluene by weight. The analysis of distillate shows 52 weight% benzene and 5 weight benzene was found in the bottom product. Calculate the amount of distillate and bottom product per 100 kg of feed per hour. Also calculate the percent recovery of benzene
- Q.38 Write a short note on the following

- a) Recycle and purge stream of material balance
- b) Gross calorific value and Net Calorific Value

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**3rd Sem / Chem, P&P, Chem Engg. (Spl. Paint Tech.),
 Chem Engg. (Spl. Polymer Engg.)**

Subject:- Chem. Process Calculations/ Ind. Chem Cal.

Time : 3Hrs. M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

- Q.1 Write Molecular weight of calcium carbonate
- a) 98 b) 100
 - c) 106 d) 72
- Q.2 Name R in ideal gas equation
- a) Universal Gas constant
 - b) Henry constant
 - c) Gravitational constant
 - d) None of these
- Q.3 Write SI unit of Force
- a) Joule b) Dyne
 - c) Newton d) Meter
- Q.4 1 horsepower is equal to _____ Watts
- a) 749 b) 746
 - c) 723 d) 726
- Q.5 Unit of work in SI System

- a) Joule b) liter
c) Poise d) Meter

Q.6 Write SI unit of energy

- a) Joule b) liter
c) Poise d) Newton

Q.7 Formula of pressure is

- a) fXa b) f/a
c) $f+a$ d) $f-a$

Q.8 Material balance is based on the law of conservation of _____

- a) force b) mass
c) energy d) Meter

Q.9 Ideal gas law is

- a) $pv=nRt$ b) $pv=zRt$
c) $pt=nRv$ d) $p=Rt$

Q.10 Average molecular weight Air is

- a) 60 b) 70
c) 29 d) 90

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Write SI unit of pressure

Q.12 Write down the SI unit of force

Q.13 Write molecular weight of sodium chloride

- Q.14 Expand MKS
Q.15 Define Standard heat of combustion

- Q.16 Define normality
Q.17 Define mole fraction
Q.18 Define unit process
Q.19 Convert 520 psi into Pascal

- Q.20 Define pure component volume

SECTION-C

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

Q.21 State and explain Hess's law of heat summation with one example

Q.22 Calculate kg moles present in 150 gram of sodium chloride

Q.23 Explain Dalton's Law and Amagat's Law

Q.24 Write down future prospects of a chemical engineer

Q.25 How many kilogram atoms of sulfur which weighs 96 kg

Q.26 Calculate value of R in J/(mol.K)

Q.27 Calculate weight of $2m^3$ of nitrogen gas at a temperature of $35^\circ C$ and 101.325 kPa pressure

Q.28 Why Gross Calorific Value is greater than Net Calorific Value. Explain

Q.29 Discuss bypass material balance with diagrams.