

MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR
DEPARTMENT OF CHEMICAL ENGINEERING

PhD ENTRANCE EXAMINATION

Max. Time: - 60 mins

Max. Marks: 60

Answer

- B 1** For estimating the liquid volume, the following equation can be used
- (A) Riedel equation (B) Rackett equation
(C) Virial equation (D) Pitzer Correlation
- B 2** For a mixture following modified Raoult's law for vapor-liquid equilibria, the activity coefficient of component i can be calculated by (x =mole fraction in liquid, y = mole fraction in vapor)
- (A) $\gamma_i = x_i P_i^{sat} / y_i P$ (B) $\gamma_i = y_i P / x_i P_i^{sat}$
(C) $\gamma_i = x_i P / y_i P_i^{sat}$ (D) $\gamma_i = x_i P_i^{sat}$
- B 3** How many moles of O₂ are required for producing 10 moles of H₂O? (Consider C₄H₁₀ is in excess)
- (A) 6.5 (B) 13
(C) 15 (D) 30
- C 4** Critical speed rpm (N_c) of a ball mill is equal to
- (A) $1 / (D-d)$ (B) $1 / (D-d)^{1/2}$ (C) $76.65 / (D-d)^{1/2}$ (D) $76.75 / (D-d)^{1/2}$
where D and d are diameter of mill (ft) and balls (ft) respectively
- A 5** Pressure drop in a packed bed for laminar flow is given by.....equation.
- (A) Kozney-Karman (B) Blake-Plummer (C) Leva's (D) Fanning friction factor
- C 6** Styrene-Butadiene rubber is commercially manufactured by
- (A) Bulk polymerisation (B) Solution polymerisation
(C) Suspension polymerization (D) Emulsion polymerization

B 7 For a gaseous phase reaction, rate of reaction is equal to $k_c C_A \cdot C_B$. If the volume of the reactor is suddenly reduced to 1/4th of its initial volume, then the rate of reaction compared to the original rate will be _____ times.

A. 8

B. 16

C. 1/8

D. 1/16

B 8 Mark the system where heat transfer is given by forced convection

A) Chilling effect of cold wind on warm body

B) Fluid passing through the tubes of a condenser and other heat exchange equipment

C) Heat flow from a hot pavement to surrounding atmosphere

D) Heat exchange on the outside of cold and warm pipes