Chemical Engineering

Answer

B **1** Laplace inverse of $s/(s^2+1)$ is

(A) $\sin(t)$ (B) $\cos(t)$

(C) $\sin(2t)$ (D) $\cos(2t)$

A **2** A tank of cross-sectional area 1 m^2 is having inlet and outlet flow rate of 60 LPM at steady state. It has a valve in outlet line with resistance of valve as R=0.01 m/LPM. The input flow rate suddenly changes to 90 LPM. The water level changes as per following equation (t is time in min),

(A) $h = 0.9 – 0.3\exp(-0.1t)$ (B) $h=0.6(1-\exp(-0.1t))$

(C) $h = 0.6 – 0.3\exp(-0.1t)$ (D) $h=1-\exp(-0.1t)$

B **3** For estimating the liquid volume, the following equation can be used

(A) Riedel equation (B) Rackett equation

(C) Virial equation (D) Pitzer Correlation

B **4** 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) $\gamma_i=x_iP_i^{sat}/y_iP$ (B) $\gamma_I = y_iP/x_iP_i^{sat}$

(C) $\gamma_i=x_iP/y_iP_i^{sat}$ (D)$\gamma_i = x_iP_i^{sat}$

B **5** How many moles of O2 are required for producing 10 moles of H_2O? (Consider C4H10 is in excess)

(A) 6.5 (B) 13

(C) 15 (D) 30

C **6** 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 **7** 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 **8** Styrene-Butadiene rubber is commercially manufactured by

(A) Bulk polymerisation (B)Solution polymerisation

(C) Suspension polymerization (D) Emulsion polymerization

B **9** For a gaseous phase reaction, rate of reaction is equal to K. CA . CB. If the volume of the reactor is suddenly reduced to l/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 **10** 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