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सतीश धवन अंतरिक्ष केंद्र शार, श्रीहरिकोटा

SATISH DHAWAN SPACE CENTRE SHAR
Sriharikota

भारतीय अंतरिक्ष अनुसंधान संगठन
Indian Space Research Organisation



Section : Chemical Engineering BE and B Tech

Q.1 Unit of mass velocity is

- A. Kg / hour
- B. Kg / m² hour
- C. Kg/m²
- D. Kg/m³ hour

Ans ☒ 1. A
☒ 2. B
☒ 3. C
☒ 4. D

Question ID : 5834939933

Q.2 The second law of thermodynamics states that

- A. Energy change of a system undergoing any reversible process is zero
- B. It is not possible to transfer heat from lower temperature to higher temperature
- C. Total energy of the system and the surroundings remains constant.
- D. None of these

Ans ☒ 1. A
☒ 2. B
☒ 3. C
☒ 4. D

Question ID : 5834939925

Q.3 Buckingham [Π]- theorm states that in any physical problem including 'n' quantities having 'm' dimensions, the quantities can be arranged into _____ independent dimensionless parameter

- A. m
- B. n
- C. n-m
- D. n/m

Ans ☒ 1. A
☒ 2. B
☒ 3. C
☒ 4. D

Question ID : 5834939936

Q.4 The temperature at which, a real gas obeys the ideal gas law, over a range of pressure is called

- A. Critical temperature
- B. Inversion temperature
- C. Reduced temperature
- D. Boyle temperature

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939926

Q.5 Toluene-di-isocyanate is used in making

- A. Dyestuffs
- B. Flexible polyurethane foams
- C. Pharmaceutical products
- D. All of the above

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939958

Q.6 The ratio of the actual mesh dimension of Taylor series to that of the next smaller screen

- A. 2
- B. $\sqrt{2}$
- C. 1.5
- D. $\sqrt{3}$

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939940

Q.7 Two pipes of same length and diameters d & $2d$ respectively are connected in series. The diameter of an equivalent pipe of same length is

- A. Less than d
- B. Between d & $1.5d$
- C. Between $1.5d$ & $2d$
- D. Greater than $2d$

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939938

Q.8 Which of the following is not an elastomer?

- A. Polyisoprene
- B. Neoprene
- C. Nitrile-butadiene
- D. None of these

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939969

Q.9 Extraction of Coffee from its seed is done by

- A. Liquid-liquid Extraction
- B. Leaching
- C. Extractive distillation
- D. Steam distillation

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939944

Q.10 The reduction ratio for grinders is defined as (D_f = Feed particle Diameter; D_p = Product particle diameter)

- A. D_f/D_p
- B. D_p/D_f
- C. $D_f - D_p$
- D. $D_f * D_p$

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939941

Q.11 The elementary liquid phase decomposition reaction $A \xrightarrow{k} 2B$ is to be carried out in a CSTR. The design equation is

A. $k\tau = \frac{X_A}{(1-X_A)}$

B. $k\tau = \frac{X_A(1+X_A)}{(1-X_A)}$

C. $k\tau = \frac{X_A}{(1-X_A)^2}$

D. $k\tau C_{A0} = \frac{X_A}{(1+X_A)^2}$

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939953

Q.12 The 2nd order system with transfer function $4/(S^2+2S+4)$ has a damping ratio of

A. 2

B. 0.5

C. 1

D. 4

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939932

Q.13 2 moles of He is mixed with 2g of H_2 . The molar heat capacity at constant pressure for the mixture is

A. $17R/6$

B. $11R/6$

C. $4R$

D. $3R/2$

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939965

Q.14 A force digital transducer, measures the pressure range of 0 – 200 N with a resolution of 0.1 % of the full scale. The smallest change it can measure is

- A. 0.2 N
- B. 0.4 N
- C. 0.5 N
- D. 1.0 N

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939931

Q.15 A particle 'A' of diameter 10 μ settles in an oil of specific gravity 0.9 and viscosity of 10 Poise under Stokes Law. A particle 'B' of diameter 20 μ settling in the same oil will have settling velocity,

- A. Same as that of A
- B. 1/4th that of A
- C. Twice as that of A
- D. 4 times as that of A

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939970

Q.16 Poly Vinyl Chloride is a

- A. Thermosetting material
- B. Thermoplastic material
- C. Fibrous material
- D. Chemically active material

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939957

Q.17 Soap solution cannot be used with hard water because

- A. Hard water contains sulphate
- B. They form insoluble calcium soap with precipitate
- C. They attract back, the removed dust
- D. None of these

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939971

Q.18 The weight fraction of methanol in an aqueous solution is 0.64. The mole fraction of methanol X_m satisfies

- A. $X_m < 0.5$
- B. $X_m = 0.5$
- C. $0.5 < X_m < 0.64$
- D. $X_m \geq 0.64$

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939964

Q.19 Bracket supports are the most suitable for supporting _____ vessels

- A. Thick walled vertical
- B. Horizontal
- C. Thin spherical
- D. None of these

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939967

Q.20 The testing pressure of storage tanks and pressure vessels designed as per Indian standard codes should be about _____ times the design pressure.

- A. 1.5 to 2
- B. 3 to 4
- C. 4 to 5
- D. >5

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939968

Q.21 A 4 KW, 20 litre water heater is switched ON for 10 min. The heat capacity for water is 4 KJ/Kg-K. Assuming total electrical energy has gone into heating the water, the increase of water temperature is

- A. 15 °C
- B. 20 °C
- C. 26 °C
- D. 30 °C

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939929

Q.22 Catalyst employed for oxidation of ammonia to nitric oxide is

- A. γ alumina
- B. Iron
- C. Platinum – Rhodium
- D. Nickel

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939959

Q.23 The most suitable equipment for removing the fine dust particle ($< 1 \mu$ diameter) from air below its dew point will be a/an

- A. Bag-filter
- B. Electrostatic precipitator
- C. Cyclone separator
- D. Wet scrubber

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939942

- Q.24** Newton's law of viscosity relates to
- A. Shear stress and Viscosity
 - B. Velocity gradient and pressure intensity
 - C. Shear stress and rate of angular deformation in a fluid
 - D. Pressure gradient and rate of angular deformation

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939934

- Q.25** A reaction of type $A \xrightarrow{1st\ order, K_1} B \xrightarrow{1st\ order K_2} C$ conducted in a batch reactor is characterized by
- A. Maximum concentration of B, with time
 - B. Maximum concentration of C, with time
 - C. Both (A) and (B)
 - D. Neither (A) nor (B)

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939952

- Q.26** The head loss due to sudden expansion is
- A. $(V_1^2 - V_2^2) / 2 g_c$
 - B. $(V_1 - V_2)^2 / 2 g_c$
 - C. $(V_1 - V_2) / 2 g_c$
 - D. $(V_1^2 - V_2^2) / g_c$

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939937

- Q.27** If two capillary tubes of diameter 0.5 mm and 1 mm are dipped in a pot containing mercury, then rise of mercury is
- Same in both the tubes
 - Greater in 1 mm diameter tube
 - Greater in 0.5 mm diameter tube
 - Zero in both the tubes

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939935

- Q.28** The conversion (X_A) for a 2nd order irreversible reaction (Constant volume) $A \xrightarrow{k_1} B$ in batch mode is given by

- $\frac{1}{1 + K_1 C_{A0} t}$
- $\frac{K_1 C_{A0} t}{1 + K_1 C_{A0} t}$
- $\frac{(K_1 C_{A0} t)^2}{1 + K_1 C_{A0} t}$
- $\frac{K_1 C_{A0} t}{(1 + K_1 C_{A0} t)^2}$

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939955

- Q.29** A dam of width 50 m is used to hold water in a reservoir. If the water height is 10 m from the bottom of the dam, what is the total force (F) acting on the dam due to the water? (Assume $g = 10 \text{ m/sec}^2$ and the fluid density is 1000 kg/m^3)

- $F = 12.5 \times 10^6 \text{ N}$
- $F = 25 \times 10^6 \text{ N}$
- $F = 50 \times 10^6 \text{ N}$
- $F = 5 \times 10^6 \text{ N}$

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939939

Q.30 The overall heat transfer co-efficient (U) for a composite wall of thickness x_1 , x_2 , x_3 and corresponding conductivities k_1 , k_2 , k_3 is given by

- A. $1/U = k_1/x_1 + k_2/x_2 + k_3/x_3$
- B. $U = k_1/x_1 + k_2/x_2 + k_3/x_3$
- C. $1/U = x_1/k_1 + x_2/k_2 + x_3/k_3$
- D. $U = x_1/k_1 + x_2/k_2 + x_3/k_3$

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939924

Q.31 Component A is diffusing in a medium B. The flux N_A relative to a stationary point is equal to the flux due to molecular diffusion, if

- A. Mass transfer is accompanied by reaction
- B. Diffusion of A is in stagnant medium B
- C. Molecular mean free path is high
- D. There is equimolar counter diffusion

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939945

Q.32 The molar composition of a gas is 10% H_2 , 10% O_2 , 30% CO_2 and balance H_2O . If 50% H_2O condenses, the final mole percent of H_2 in the dry gas will be

- A. 10%
- B. 5%
- C. 18.18%
- D. 20%

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939966

Q.33 The vessel dispersion number of an ideal CSTR is

- A. -1
- B. 0
- C. 1
- D. ∞

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939950

Q.34 A counter flow heat exchanger is used to heat water from 20 °C to 80 °C by using exhaust gas entering at 140 °C and leaving at 80 °C. What is the LMTD for the best heat exchanger?

- A. 80 °C
- B. 60 °C
- C. 110 °C
- D. Not determinable

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939923

Q.35 If P_A is the partial pressure of Vapour A in a vapour-gas mixture and P_S is the saturation vapour pressure of liquid A, condensation of vapour-gas just begins when

- A. $P_A > P_S$
- B. $P_A < P_S$
- C. $P_A = P_S$
- D. None of above

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939949

Q.36 Vulcanisation of rubber

- A. Decreases in tensile strength
- B. Increases its ozone and oxygen reactivity
- C. Increases its oil and solvent resistance
- D. Converts its plasticity to elasticity

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939961

Q.37 For a certain gas phase reaction, $-\frac{dC_A}{dt} = K C_A^n$. The rate of reaction in terms of partial pressures may be expressed as

- A. $-\frac{dP_A}{dt} = K P_A^n$
- B. $-\frac{dP_A}{dt} = KRT P_A^n$
- C. $-\frac{dP_A}{dt} = K (RT)^{1-n} P_A^n$
- D. $-\frac{dP_A}{dt} = K (RT)^n P_A^{1-n}$

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939951

Q.38 ____ explains the equilibrium constant for any chemical reaction.

- A. Henry's law
- B. Law of mass action
- C. Hess's law
- D. Raoult's law

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939928

Q.39 For the same feed, feed quality and separation (in a distillation column) with increase of total pressure, number of ideal plates will

- A. Increase
- B. Decrease
- C. Remains same
- D. Data insufficient, can't be predicted

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939946

Q.40 The ratio of surface convection resistance to internal conduction resistance is called

- A. Grashof number
- B. Biot number
- C. Stanton number
- D. Prandtl number

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939922

Q.41 According to Debye-Bueche theory, the viscosity of a polymer solution or melts is proportional to

- A. Concentration
- B. Molecular weight
- C. Both (A) and (B)
- D. None of these

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939962

Q.42 The value of Vanderwaals' constant 'a' for gases O_2 , N_2 , NH_3 and CH_4 are 1.36, 1.39, 4.17 and $2.25 \text{ l}^1.\text{atm}.\text{mol}^{-2}$ respectively. The gas which can be most easily liquified is

- A. O_2
- B. N_2
- C. NH_3
- D. CH_4

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939963

Q.43 Buna-N is a polymer of

- A. Butadiene
- B. Butadiene and Styrene
- C. Butadiene and Acrylonitrile
- D. Styrene and Acrylonitrile

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939960

Q.44 Entropy is a/an

- A. State function
- B. Macroscopic property
- C. Extensive property
- D. None of these

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939927

Q.45 A 5l chemostat is fed fresh medium at 0.2 l/min having a substrate concentration of 25g/l. At steady state, the outgoing stream has substrate concentration of 2.5 g/l. The rate of consumption in (g/ l /min) of the substrate in the reactor is

- A. 1.2
- B. 0.5
- C. 0.9
- D. 1.5

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939956

Q.46 Which of the following solutions will follow Raoult's Law most closely?

- A. A solution of Benzene, Toluene and O-xylene
- B. 35% solution Camphor in Water
- C. 35% solution NH_3 in Water
- D. A Solution of polar organic compounds (Not of homologs of a series)

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939947

Q.47 Mc-leod gauge is a

- A. U tube filled with mercury
- B. U tube filled with low vapour pressure oil
- C. Liquid manometer along with pressure amplifier
- D. None of these

Ans  1. A
 2. B
 3. C
 4. D

Question ID : 5834939930

Q.48 A solid coated on the surface of a flat plate dissolves in a liquid flowing past the plate at an angle of incidence, Diffusion of the solute occurs through the boundary layer formed on the plate. In such a case, the thickness of the momentum boundary layer is expected to be greater than the concentration boundary layer, if Schmidt Number, S_c is

- A. > 1
- B. < 1
- C. 1
- D. 0.005

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939948

Q.49 At what percentage (by volume) of Alcohol composition it forms an azeotrope with water

- A. 90
- B. 91.5
- C. 95
- D. 99

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939943

Q.50 The conversion for a first order liquid phase reaction $A \rightarrow B$, in a CSTR is 50 %. If another CSTR of the same volume is connected in series, then the percentage conversion at the exit of the second reactor will be

- A. 60
- B. 75
- C. 90
- D. 100

Ans  1. A

 2. B

 3. C

 4. D

Question ID : 5834939954