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Chemical engineering

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Question Number : 1 Question Id : 8273471 Question Type : MCQ

$1000 \text{ lb}_m.\text{ft/min}$ is equal to X kg.cm/s^2, where

Options :
X=3.73
X=3.93
X=3.63
X=3.83

Question Number : 2 Question Id : 8273472 Question Type : MCQ

If the approximate molar composition of air is 79% N_2 and 21% O_2, then the mass composition of air is

Options :

76.7% N_2 and 23.3% O_2

76.1% N_2 and 23.9% O_2

78.1% N_2 and 21.9% O_2

77.7% N_2 and 22.3% O_2

Question Number : 3 Question Id : 8273473 Question Type : MCQ

One litre of an alcohol (density=810 kg/m^3) is mixed with one litre of water (density=1005 kg/m^3) to form a solution (density=960 kg/m^3), find the total volume of the solution?

Options :

1.99 litre

1.89 litre

2.04 litre

2.13 litre

Question Number : 4 Question Id : 8273474 Question Type : MCQ

One (short) ton is approximately equal to

Options :

1007 kg

950 kg

907 kg

1000 kg

Question Number : 5 Question Id : 8273475 Question Type : MCQ

Value of specific heat ratio for monoatomic gases is

Options :

1

1.44

2

1.66

Question Number : 6 Question Id : 8273476 Question Type : MCQ

Isotonic solutions have the same

Options :

Viscosity

Normality

Molar concentration

specific heat ratio

Question Number : 7 Question Id : 8273477 Question Type : MCQ

Which of the following has the least effect on the solubility of gas in a solvent

Temperature

Pressure

Nature of gas

Nature of solvent

Question Number : 8 Question Id : 8273478 Question Type : MCQ

Thickness of thermal boundary layer is more compared to that of hydrodynamic boundary layer, when the value of Prandtl number is

Options :
1

>1

<1

>5

Question Number : 9 Question Id : 8273479 Question Type : MCQ

An example of Bingham plastic is

Options :
Gas

Non-colloidal solution

Sewage sludge

Rubber latex

Question Number : 10 Question Id : 82734710 Question Type : MCQ

For laminar flow in a pipe, the value of momentum correction factor (β)

Options :
3/4

4/3

0

1

Question Number : 11 Question Id : 82734711 Question Type : MCQ

Reynolds analogy is

Options :
[Nu / (RePr)] + f/2

[Nu / (RePr)] + 2/f

[Re / (NuPr)] + f/2

[Pr / (ReNu)] + f/2

Question Number : 12 Question Id : 82734712 Question Type : MCQ

Creeping flow is obtained only at Re of the order of

Question Number : 13 Question Id : 82734713 Question Type : MCQ

Viscosity of gases increases with

Options :

increase in temperature

decrease in temperature

independent of temperature

first decreases upto 150 °C and then increases with temperature

Question Number : 14 Question Id : 82734714 Question Type : MCQ

For the annular flow, surface of zero momentum is closer to

Options :

Outer wall

Inner wall

Exactly in between

Close to outer wall

Question Number : 15 Question Id : 82734715 Question Type : MCQ

For liquid flow through a packed bed, the superficial velocity as compared to average velocity through the channel in the bed is

Options :

more

less

equal

independent of porosity

Question Number : 16 Question Id : 82734716 Question Type : MCQ

A 100 kmol mixture of benzene and toluene containing 60 mol% benzene is separated into top product (D) containing 80 mol% benzene and a bottom product (B) containing 20 mol% benzene. What is the amount of top product (D)?

Options :

50 kmol

25 kmol

33.3 kmol

66.7 kmol

Question Number : 17 Question Id : 82734717 Question Type : MCQ

Which of the following statement is true

Options :

Dew point is dependent of dry bulb temperature

Dew point is independent of dry bulb temperature

Dew point is dependent on both dry bulb temperature and wet bulb temperature

Dew point is dependent of dry bulb temperature and independent on wet bulb temperature

Question Number : 18 Question Id : 82734718 Question Type : MCQ

In the froth floatation process, pine oil and cresylic acid are used as

Options :

frother

collector

depressor

conditioner

Question Number : 19 Question Id : 82734719 Question Type : MCQ

Bond number is the ratio of

Options :

Gravity force to surface tension force

Pressure force to surface tension force

Gravity force to pressure force

Viscous force to surface tension force

Question Number : 20 Question Id : 82734720 Question Type : MCQ

Colloid mills achieve size reduction mainly by

Options :

impact

attrition

cutting

compression

Question Number : 21 Question Id : 82734721 Question Type : MCQ

Solid particles separation based on difference in their flow velocities through fluids is termed as

Options :

elutriation

sedimentation

classification

clarification

Question Number : 22 Question Id : 82734722 Question Type : MCQ >

The most commonly used dispersing agents to prevent flocculation are

Options :

carbonates

bi-carbonates

sulphates

silicates & phosphates

Question Number : 23 Question Id : 82734723 Question Type : MCQ

The most suitable equipment for the transportation of 200 mesh size particles is

Options :

belt conveyor

pneumatic conveyor

screw conveyor

bucket conveyor

Question Number : 24 Question Id : 82734724 Question Type : MCQ

Wet sieving is employed, when the product contains

Options :

abrasive materials in large quantity

coarse materials in large quantity

non-sticky materials in large quantity

very fine materials in large quantity

Question Number : 25 Question Id : 82734725 Question Type : MCQ

Energy consumed for crushing one ton of material ranges from

Options :

0.01 to 0.1 kWh

0.5 to 1.5 kWh

2 to 3.5 kWh

4 to 5 kWh

Question Number : 26 Question Id : 82734726 Question Type : MCQ

The critical radius for the curved insulation

Options :

remains unaffected with change in the thermal conductivity of insulation

increases with decrease in the thermal conductivity of insulation

decreases with decrease in the thermal conductivity of insulation

increases linearly with decrease in the thermal conductivity of insulation

Question Number : 27 Question Id : 82734727 Question Type : MCQ

In shell and tube heat exchangers, the fluid having corrosive and fouling tendency is routed through

Options :

the shell

either shell or tube but at very slow velocity

the shell, when the flow is counter-current; and the tube, when the flow is co-current

the tube due to easier internal cleaning of the tubes.

Question Number : 28 Question Id : 82734728 Question Type : MCQ

Which tube arrangement in heat exchangers facilitates highest heat transfer rate?

Options :

Triangular pitch

Square pitch

Diagonal square pitch

Heat transfer rate is independent of tube arrangement

Question Number : 29 Question Id : 82734729 Question Type : MCQ

Stefan boltzman constant in w/m^2k^4 is

Options :

3.669×10^{-9}

4.669×10^{-9}

5.669×10^{-9}

6.669×10^{-9}

Question Number : 30 Question Id : 82734730 Question Type : MCQ

Which of the statement is true

Options :

Thermal conductivity of substance depends on temperature

Thermal conductivity of metal increases with temperature

Thermal conductivity of gases are generally higher

Thermal conductivity of gases are generally lower

Question Number : 31 Question Id : 82734731 Question Type : MCQ

In which of the following membrane process-driving force is not pressure gradient

Options :

Microfiltration

Ultrafiltration

Reverse osmosis

Dialysis

Question Number : 32 Question Id : 82734732 Question Type : MCQ

Eutonic point is used in

Options :

Distillation

Evaporation

Sublimation

Crystallisation

Question Number : 33 Question Id : 82734733 Question Type : MCQ

Heuristic rules is used in

Options :

Distillation

Evaporation

Crystallisation

Liquid-liquid extraction

Question Number : 34 Question Id : 82734734 Question Type : MCQ

If atmospheric temperature and the dew point are same, than the relative humidity is

Options :

zero

50 %

100 %

No relation

Question Number : 35 Question Id : 82734735 Question Type : MCQ

The minimum tray spacing in distillation column of diameter less than 3 ft is normally

Options :

6 inch

12 inch

18 inch

24 inch

Question Number : 36 Question Id : 82734736 Question Type : MCQ

Which of the following efficiency can be greater than 100%?

Options :

Point efficiency

Overall efficiency

Murphree plate efficiency

None of the other option

Question Number : 37 Question Id : 82734737 Question Type : MCQ

If the pressure of the gas is increased the value of diffusivity

Options :

increases

decreases

remains constant

Any of the other option

Question Number : 38 Question Id : 82734738 Question Type : MCQ

Which of the following fundamental thermodynamics equations is not correct?

Options :

$dU = T\, dS - P\, dV$

$dH = T\, dS + V\, dP$

$dA = -P\, dV + S\, dT$

$dG = V\, dP - S\, dT$

Question Number : 39 Question Id : 82734739 Question Type : MCQ

Gibbs phase rule relates degree of freedom (F), number of components (C) and number of phases (P) by following equation:

Options :

F-P-C-2=0

F-P+C-2=0

F+P-C+2=0

F+P-C-2=0

Question Number : 40 Question Id : 82734740 Question Type : MCQ

Compressibility factor for almost all the gases are approximately same at the

Options :

same pressure

same pressure and temperature

same reduced pressure and reduced temperature

same critical pressure and critical temperature

Question Number : 41 Question Id : 82734741 Question Type : MCQ

Which of the following equation is not used for the prediction of activity coefficients from experimental data

Options :

Van Laar equation

Van't Hoff equation

Wilson equation

Margules equation

Question Number : 42 Question Id : 82734742 Question Type : MCQ

As per Duhem's theorem, for any closed system formed initially from given masses of prescribed chemical species, the equilibrium state is completely determined when _____ independent variables are fixed period.

Options :
One
Two
Three
Four

Question Number : 43 Question Id : 82734743 Question Type : MCQ

Partial molal quantities are used during study of

Options :
Pure component
Ideal gases
Ideal solutions
Non-ideal mixtures

Question Number : 44 Question Id : 82734744 Question Type : MCQ

Which of the following is not a refrigerant?

Options :
Furan
Ammonia
Carbon di-oxide
Sulfur di-oxide

Question Number : 45 Question Id : 82734745 Question Type : MCQ

Which of the following gases most closely behaves as an ideal gas?

Options :
Nitrogen
Hydrogen
Helium
Oxygen

Question Number : 46 Question Id : 82734746 Question Type : MCQ

For an ideal gas, difference between adiabatic compressibility and isothermal compressibility is

Options :
Positive

Negative

Zero

Infinite

Question Number : 47 Question Id : 82734747 Question Type : MCQ

Colligative means depending

Options :

on the number of particles

on the nature of particles

on both number and nature of particles

on identity of individual particles

Question Number : 48 Question Id : 82734748 Question Type : MCQ

Lewis-Randall rule leads to Raoult's law at

Options :

low temperature

low pressure

very high temperature

very high pressure

Question Number : 49 Question Id : 82734749 Question Type : MCQ

For a pure substance, Gibbs free energy per mole is equal to

Options :

fugacity

latent heat of vaporization

heat capacity

chemical potential

Question Number : 50 Question Id : 82734750 Question Type : MCQ

In the Claude gas liquefaction process, cooling is done

Options :

by expansion

at constant pressure

at constant temperature

by throttling

Question Number : 51 Question Id : 82734751 Question Type : MCQ

For same residence time, maximum conversion will be obtained in which of the following cases

Options :

Single tubular reactor (volume=2V)

Single stirred tank reactor (volume=2V)

Two stirred tank reactors (volume=V each)

Stirred tank reactor followed by single tubular reactor (volume=V each)

Question Number : 52 Question Id : 82734752 Question Type : MCQ

For auto-thermal reaction, maximum conversion will be obtained in which of the following cases

Options :

Batch reactor

Semi-batch reactor

Stirred tank reactor

Plug flow reactor

Question Number : 53 Question Id : 82734753 Question Type : MCQ

For autocatalytic reaction, maximum conversion will be obtained in which of the following cases

Options :

Stirred tank reactors in series

Plug flow reactors in series

Plug flow reactor followed by stirred tank reactor

Stirred tank reactor followed by plug flow reactor

Question Number : 54 Question Id : 82734754 Question Type : MCQ

For which of the following reactions, reaction rate does not decreases much as the reaction proceeds

Options :

Catalytic

Auto-catalytic

Parallel

Series

Question Number : 55 Question Id : 82734755 Question Type : MCQ

For reactions carried out in plug flow reactor, dispersion number is

Options :

0 (zero)

1

-1

∞ (infinity)

Question Number : 56 Question Id : 82734756 Question Type : MCQ

Effectiveness factor of a catalyst pellet is a measure of the

Options :

gas film diffusion resistance

bulk resistance

pore diffusion resistance

chemical reaction resistance

Question Number : 57   Question Id : 82734757   Question Type : MCQ

Which gas is used for determining the surface area of the catalysts

Options :

Nitrogen

Hydrogen

Helium

Carbon di-oxide

Question Number : 58   Question Id : 82734758   Question Type : MCQ

Relationship between effective diffusivity (D_E), molecular diffusivity (D_M) and Knudsen diffusivity (D_K) is given as"

Options :

$D_E = D_M / D_K$

$D_E = D_M \times D_K$

$(1/D_E) = (1/D_M) + (1/D_K)$

$D_E = D_M + D_K$

Question Number : 59   Question Id : 82734759   Question Type : MCQ

Reaction with high activation energy are

Options :

always non-spontaneous

always spontaneous

fast

slow

Question Number : 60   Question Id : 82734760   Question Type : MCQ

A reactor which has non-uniform and steady concentration is

Options :

Batch reactor

Semi-batch reactor

Plug-flow reactor

Stirred tank reactor

Question Number : 61   Question Id : 82734761   Question Type : MCQ

Flow profile is laminar in

Options :

Batch reactor

Tubular reactor

Plug-flow reactor

Stirred tank reactor

Question Number : 62 Question Id : 82734762 Question Type : MCQ

Fanning equation is applicable for _____ region flow.

Options :

transition

laminar

turbulent

laminar and turbulent

Question Number : 63 Question Id : 82734763 Question Type : MCQ

Which of the following equations is valid for laminar flow of a fluid through a packed bed?

Options :

Fanning equation

Kozney – Karman equation

Hagen – Poiseuille equation

Blake – Plummer equation

Question Number : 64 Question Id : 82734764 Question Type : MCQ

Which of the following controllers has the least maximum deviation?

Options :

P controller

PI controller

PID controller

PD controller

Question Number : 65 Question Id : 82734765 Question Type : MCQ

In Bode stability criterion, amplitude ratio at 180° should be

Options :

1

< 1

> 1

0

Question Number : 66 Question Id : 82734766 Question Type : MCQ

Frequency response of a second order system will be sinusoidal when

Options :

Damping coefficient is zero

It is under-damped

It is over-damped

It is critically-damped

Question Number : 67 Question Id : 82734767 Question Type : MCQ

In the second order underdamped system

Options :

Decay ratio = overshoot

Decay ratio = (overshoot)^2

Decay ratio = (overshoot)$^{0.33}$

Decay ratio = (overshoot)$^{0.5}$

Question Number : 68 Question Id : 82734768 Question Type : MCQ

Pyranometer is used for measuring

Options :

Measuring temperatures from 500 to 1000 °C

Measuring temperatures from 0 to 500 °C

Measuring solar radiation flux

Collecting solar energy

Question Number : 69 Question Id : 82734769 Question Type : MCQ

Solenoid value works like

Options :

P controller

P-I controller

P-D controller

On-off controller

Question Number : 70 Question Id : 82734770 Question Type : MCQ

The frequency at which maximum amplitude ratio is attained is called

Options :

resonant frequency

corner frequency

cross-over frequency

natural frequency

Question Number : 71 Question Id : 82734771 Question Type : MCQ

Response of a linear control system for a change in set point is called

Options :

Frequency response

servo problem

transient response

regulator problem

Question Number : 72 Question Id : 82734772 Question Type : MCQ

Effective and nominal interest rates are equal when the interest is compounded

Options :

Fortnightly

Half-yearly

Monthly

Annually

Question Number : 73 Question Id : 82734773 Question Type : MCQ

Six-tenth factor rule is used for estimating the

Options :

Utilities cost

Piping cost

Equipment cost by scaling

Equipment installment cost

Question Number : 74 Question Id : 82734774 Question Type : MCQ

Profit is obtained by subtracting _____ from revenue

Options :

Total cost

Fixed cost

Operating cost

Book value

Question Number : 75 Question Id : 82734775 Question Type : MCQ

Break-even point is the intersection of

Options :

Total cost and fixed cost

Fixed cost and operating cost

Fixed cost and sales revenues

Total cost and sales revenues

Question Number : 76 Question Id : 82734776 Question Type : MCQ

Test for determination of BOD_3 is carried out at

Options :
20 °C
23 °C
27 °C
30 °C

Question Number : 77 Question Id : 82734777 Question Type : MCQ

In India, the pH value of rain lies in the range of

Options :
5-6
6-7
3-4
4-5

Question Number : 78 Question Id : 82734778 Question Type : MCQ

Mesophilic temperature range is from

Options :
0-10 °C
12-20 °C
25-42 °C
45-60 °C

Question Number : 79 Question Id : 82734779 Question Type : MCQ

Impurities in the size range of 1-1000 micro-meters are suggested to be treated by

Options :
Ultra-filtration
Micro-filtration
Nano-filtration
Reverse Osmosis

Question Number : 80 Question Id : 82734780 Question Type : MCQ

Impurities in the size range of 0.001-1 micro-meters are considered as

Options :
Dissolved impurities
Colloidal impurities
Suspended impurities
Non-colloidal impurities

Question Number : 81 Question Id : 82734781 Question Type : MCQ

6 ml of wastewater is diluted to 300 ml distilled water in standard BOD bottle. Initial DO in the bottle is determined to be 8.5 mg/l. DO after 5 days at 20 C is found to be 5 mg/l. BOD_5 of wastewater is

Options :

150 mg/l

125 mg/l

175 mg/l

200 mg/l

Question Number : 82 Question Id : 82734782 Question Type : MCQ

Mercury pollution is mainly due to the emission from

Options :

Petrochemical industry

Thermal power plant

Electroplating industry

Paint industry

Question Number : 83 Question Id : 82734783 Question Type : MCQ

Hazardous waste could be incinerated in

Options :

Pulp and paper industry

Electroplating industry

Cement industry

Petrochemical industry

Question Number : 84 Question Id : 82734784 Question Type : MCQ

If the flow through a circular clarifier is 500 cubic meter per hour and that the surface overflow rate is 50 $m^3/m^2 \cdot$ day. What should be the clarifier diameter?

Options :

17.48 m

16.77 m

19.24 m

20.25 m

Question Number : 85 Question Id : 82734785 Question Type : MCQ

Bhopal gas tragedy was caused by the release of

Options :

EIC

BIC

MIC

MIG

Question Number : 86 Question Id : 82734786 Question Type : MCQ

Limestone is predominantly

Options :

magnesium carbonate

calcium carbonate

sodium carbonate

potassium carbonate

Question Number : 87 Question Id : 82734787 Question Type : MCQ

Coke oven gas is composed of

Options :

CO and CO_2

CH_4 and C_2H_4

CH_4 and CO_2

CO, N_2 and H_2

Question Number : 88 Question Id : 82734788 Question Type : MCQ

The high temperature carbonization of coal is carried out at

Options :

900-1150°C

1250-1500°C

600-800°C

175-275°C

Question Number : 89 Question Id : 82734789 Question Type : MCQ

Producer gas is obtained by

Options :

thermal cracking of naphtha

passing steam and air through red hot coke

passing air through red hot coke

passing steam through red hot coke

Question Number : 90 Question Id : 82734790 Question Type : MCQ

Raw material for the manufacture of calcium carbide are

Options :

limestone and coke

limestone and slaked lime

limestone and sand

limestone and caustic soda

Question Number : 91 Question Id : 82734791 Question Type : MCQ

From which of the processes propylene is recovered in the refinery

Options :

Alkylation

Catalytic dewaxing

Catalytic reforming

Fluid catalytic cracking

Question Number : 92 Question Id : 82734792 Question Type : MCQ

For storing 100%sulphuric acid which of the following material will be used

Options :

Ordinary carbon steel

Aluminum

SS 304

Lead

Question Number : 93 Question Id : 82734793 Question Type : MCQ

Which of the following is used as feedstock in manufacture of linear alkyl benzene

Options :

Light diesel

Light cycle oil

Kerosene

Gas oil

Question Number : 94 Question Id : 82734794 Question Type : MCQ

Ter amyl methyl ether (TAME) is made by etherification of

Options :

Isoprene

Cyclopentadiene

Dicyclopentadiene

2-methyl butene

Question Number : 95 Question Id : 82734795 Question Type : MCQ

Which of the following is used for the manufacture of terephthalic acid

Options :

p-xylene

m-xylene

o-xylene

Mixed xylenes

Question Number : 96 Question Id : 82734796 Question Type : MCQ

Pyrolysis gasoline is obtained from which of the following process

Options :

Hydrocracking

Fluid catalytic cracking

Naphtha cracking

Catalytic reforming

Question Number : 97 Question Id : 82734797 Question Type : MCQ

Desulfurization of liquid fuels in the refinery is carried out using

Options :

Adsorptive desulfurization

Hydro desulfurization

Oxidative desulfurization

Photo desulfurization

Question Number : 98 Question Id : 82734798 Question Type : MCQ

Most commonly used rubber vulcanization agent is

Options :

Nickel

Sulfur

Bromine

Chlorine

Question Number : 99 Question Id : 82734799 Question Type : MCQ

Which of the following plastic has lowest cost

Options :

Polythene

PVC

Teflon

Bakelite

Question Number : 100 Question Id : 827347100 Question Type : MCQ

Zeigler-Natta catalyst is used in the manufacture of

Options :

Vinyl acetate

Styrene

PTFE

Propylene