

Telangana State Council Higher Education

Notations :

- Options shown in **green** color and with  icon are correct.
- Options shown in **red** color and with  icon are incorrect.

Question Paper Name :	Chemical Engineering 30th May 2026 Shift 1
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Chemical Engineering

Group Number :	1
Group Id :	10513142
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Show Attended Group? :	No
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Mathematics

Section Id :	10513194
Section Number :	1
Section type :	Online

Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	10
Section Marks :	10
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	10513194
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 1051315401 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $A = \begin{bmatrix} 2 & 1 & 2 \\ 6 & 2 & 11 \\ 3 & 3 & 2 \end{bmatrix}$, $P = \begin{bmatrix} 1 & 0 & 1 \\ 2 & 1 & 2 \\ 0 & 1 & 5 \end{bmatrix}$ then $|P^{-1}AP - 2I| =$

Options :

1. ✖ 55

2. ✔ 69

3. ✖ 96

4. ✖ 38

Question Number : 2 Question Id : 1051315402 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The system of equations $2x + y = 2z$, $y + z = 0$, $3y + \alpha z = x$ has

Options :

1. ✖ No solution for any value of α

2. ✖ Infinite number of solutions for $\alpha = \frac{7}{2}$

3. ✖ Only trivial solution for $\alpha = \frac{9}{2}$

4. ✓ Infinite solutions of the form $(3k, -2k, 2k)$

Question Number : 3 Question Id : 1051315403 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A function satisfying the conditions of Lagrange's mean value theorem on the interval $[1, 5]$ is

Options :

1. ✓ $f(x) = |x-1| + |x-5|$

2. ✗ $g(x) = x - [x]$ ($[x]$ represents integral part of x)

3. ✗
$$h(x) = \begin{cases} 3x-1, & 0 \leq x \leq 1 \\ x^2+1, & 1 \leq x \leq 4 \\ 17, & 4 \leq x \leq 6 \end{cases}$$

4. ✗
$$k(x) = \begin{cases} x^2, & -\infty < x \leq 1 \\ x, & 1 \leq x \leq \infty \end{cases}$$

Question Number : 4 Question Id : 1051315404 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The value of $\int_C xdy - ydx$, where C is the boundary of rectangular region formed by

$x=5$, $x=12$, $y=0$ and $y=8$ is

Options :

1. ✗ 56

2. ✗ 28

3. ✓ 112

4. ✗ 72

Question Number : 5 Question Id : 1051315405 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the integrating factor of $\frac{dy}{dx} + \left[(x^2 - 2x) \cos x + 2(x-1) \sin x \right] y = x^2$ is $e^{f(x)}$, then $f(3) =$

Options :

1. ✖ $3 \cos 3 + 4 \sin 3$

2. ✖ $4 \cos 3$

3. ✔ $3 \sin 3$

4. ✖ $4 \sin 3 + \cos 3$

Question Number : 6 Question Id : 1051315406 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Laplace transform of $\int_0^t u^2 \sin(t-u) du$ is

Options :

1. ✖ $\frac{2}{s(s+1)}$

2. ✖ $\frac{1}{s^2(s^3+1)}$

3. ✔ $\frac{2}{s^3(s^2+1)}$

4. ✖ $\frac{2}{s(s^2+1)}$

Question Number : 7 Question Id : 1051315407 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Two dice are thrown simultaneously. Let X be the random variable representing the absolute difference of the numbers appeared on the dice. The mean of X is

Options :

1. ✓ $\frac{35}{18}$

2. ✗ $\frac{13}{36}$

3. ✗ $\frac{7}{12}$

4. ✗ 3

Question Number : 8 Question Id : 1051315408 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $f(x)$ is the probability density function of a exponential distribution and $\frac{1}{\lambda}$ is its

mean, then $\int_0^{\infty} x^2 f(x) dx =$

1. ✗ $\frac{1}{\lambda^2}$

2. ✗ $\frac{3}{\lambda^2}$

3. ✓ $\frac{2}{\lambda^2}$

4. ✗

$$\frac{1}{\lambda} + \frac{2}{\lambda^2}$$

Question Number : 9 Question Id : 1051315409 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The solution of $\frac{dy}{dx} - y - 2x + x^2 = 0$, $y(0) = 1$ at $x = 0.2$ using Euler's method is

Options :

1. ✓ 1.229

2. ✗ 1.1

3. ✗ 1.37

4. ✗ 1.521

Question Number : 10 Question Id : 1051315410 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

By assuming that the solution to the equation $x^4 - x - 10 = 0$ lies between $x = 1.8$ and $x = 2$ then next approximate solution by Regula-falsi method is
(Take $f(1.8) = -1.3024$)

Options :

1. ✓ 1.8491

2. ✗ 1.9932

3. ✗ 1.8001

4. ✗ 1.9091

Chemical Engineering

Section Id :

10513195

Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	110
Number of Questions to be attempted :	110
Section Marks :	110
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	10513195
Question Shuffling Allowed :	Yes

Question Number : 11 Question Id : 1051315411 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A butane isomerization process produces 70 k mol/h of pure iso-butane. A purge stream removed continuously contains 85% n - butane and 15% impurity (mole %). The feed stream is n-butane containing 1% impurity (mole %). The flow rate of the purge stream will be?

Options :

- ✗ 3 k mol/h
- ✗ 4 k mol/h
- ✓ 5 k mol/h
- ✗ 6 k mol/h

Question Number : 12 Question Id : 1051315412 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The weight fraction of methanol in an aqueous solution is 0.64. The mole fraction of methanol X_M satisfies

Options :

- ✗ $X_M < 0.5$
- ✓ $X_M = 0.5$

3. ✖ $0.5 < X_M < 0.64$

4. ✖ $X_M > 0.64$

Question Number : 13 Question Id : 1051315413 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The composition of Air in weight percent is

Options :

1. ✔ $N_2 - 77\%, O_2 - 23\%$

2. ✖ $N_2 - 21\%, O_2 - 79\%$

3. ✖ $N_2 - 23\%, O_2 - 77\%$

4. ✖ $N_2 - 79\%, O_2 - 21\%$

Question Number : 14 Question Id : 1051315414 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The net heat evolved or absorbed in a chemical process is the same whether the reaction takes place in one or in several steps is known as

Options :

1. ✖ Kirchoff's law

2. ✖ Lechatelier's principle

3. ✖ Beer's law

4. ✔ Hess's law

Question Number : 15 Question Id : 1051315415 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

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 gas on a dry basis will be

Options :

1. ✖ 10 %
2. ✖ 5 %
3. ✖ 18.18 %
4. ✔ 20 %

Question Number : 16 Question Id : 1051315416 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Absolute zero temperature is

Options :

1. ✖ 273°C
2. ✖ 0°C
3. ✔ -273°C
4. ✖ 373°C

Question Number : 17 Question Id : 1051315417 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following does not change during a phase change such as melting, vaporization and sublimation?

Options :

1. ✖ Specific internal energy
2. ✖ Specific enthalpy
3. ✖ Specific entropy

4. ✓ Specific Gibbs Free energy

Question Number : 18 Question Id : 1051315418 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Clayperon equation deals with

Options :

1. ✓ Rate of change of vapour pressure with temperature
2. ✗ Effect of an inert gas on vapour pressure
3. ✗ Calculation of ΔF for spontaneous phase change
4. ✗ Temperature dependence of heat phase transition

Question Number : 19 Question Id : 1051315419 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Ideal refrigeration cycle is

Options :

1. ✗ Same as Carnot cycle
2. ✓ Same as reverse Carnot cycle
3. ✗ Dependent on the refrigerant's properties
4. ✗ The least efficient of all refrigeration processes

Question Number : 20 Question Id : 1051315420 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following is true for a throttling process?

Options :

1. ✖ A gas may have more than one inversion temperature
2. ✔ The inversion temperature is different for different gases
3. ✖ The inversion temperature is same for all gases

The inversion temperature is the temperature at which Joule-Thomson co-efficient is

4. ✖ infinity

Question Number : 21 Question Id : 1051315421 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A process flow sheet analysis results in the degree of freedom having a value of 2. Which one of the following steps must be carried out?

Options :

1. ✖ Identify and add two new independent equations from process model
2. ✔ Remove two equations that have been wrongly assumed to be independent
3. ✖ Assign values of two variables in the process

Assign value to one variable and remove one equation that was wrongly assumed

4. ✖ to be independent

Question Number : 22 Question Id : 1051315422 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A cyclic engine exchanges heat with two reservoirs maintained at 100 °C and 300 °C respectively. The maximum work (in J) that can be obtained from 1000 J of heat extracted from the hot reservoir is

Options :

1. ✔ 349
2. ✖ 651

3. ✖ 667

4. ✖ 1000

Question Number : 23 Question Id : 1051315423 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The thermal efficiency of a reversible heat engine operating between two given thermal reservoirs is 0.4. The device is used either as a refrigerator or as a heat pump between the same reservoirs. Then the coefficient of performance as a refrigerator $(COP)_R$ and the coefficient of performance as a heat pump $(COP)_{HP}$ are

Options :

1. ✖ $(COP)_R = (COP)_{HP} = 0.6$ 2. ✖ $(COP)_R = 2.5; (COP)_{HP} = 1.5$ 3. ✔ $(COP)_R = 1.5; (COP)_{HP} = 2.5$ 4. ✖ $(COP)_R = (COP)_{HP} = 2.5$

Question Number : 24 Question Id : 1051315424 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

High pressure steam is expanded adiabatically and reversibly through a well- insulated turbine which produces some shaft work. If the enthalpy change and entropy change across the turbine are represented by ΔH and ΔS respectively for this process, then

Options :

1. ✖ $\Delta H = 0$ and $\Delta S = 0$ 2. ✔ $\Delta H \neq 0$ and $\Delta S = 0$ 3. ✖ $\Delta H \neq 0$ and $\Delta S \neq 0$ 4. ✖ $\Delta H = 0$ and $\Delta S \neq 0$

Question Number : 25 Question Id : 1051315425 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Generalized compressibility factor chart is a plot of

Options :

1. ✖ Compressibility factor versus reduced temperature with reduced pressure as parameter
2. ✔ Compressibility factor versus reduced pressure with reduced temperature as parameter
3. ✖ Compressibility factor versus reduced pressure with absolute temperature as parameter
4. ✖ Compressibility factor versus reduced temperature with absolute pressure as parameter

Question Number : 26 Question Id : 1051315426 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For a fully turbulent flow ($Re > 10^5$) in a pipe of diameter d , with a constant pressure gradient, the volumetric flow rate (Q) of an incompressible fluid varies with the diameter as

Options :

1. ✖ d
2. ✖ d^2
3. ✔ $d^{2.5}$
4. ✖ d^4

Question Number : 27 Question Id : 1051315427 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Applying a pressure drop across a capillary results in a volumetric flow rate 'Q' under laminar flow conditions. The flow rate, for the same pressure drop, in a capillary of the same length but half the radius is

Options :

1. ✖ $\frac{Q}{2}$

2. ✖ $\frac{Q}{4}$

3. ✖ $\frac{Q}{8}$

4. ✔ $\frac{Q}{16}$

Question Number : 28 Question Id : 1051315428 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For an ideal fluid flow the Reynolds number is

Options :

1. ✖ one

2. ✖ zero

3. ✔ infinity

4. ✖ 4000

Question Number : 29 Question Id : 1051315429 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

When the water flows over a rectangular suppressed weir, the pressure beneath the nappe is

Options :

1. ✖ Very high

2. ✖ Slightly above atmospheric

- 3. ✖ Atmospheric
- 4. ✔ Negative

Question Number : 30 Question Id : 1051315430 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The velocity distribution in the turbulent boundary layer follows

Options :

- 1. ✖ Straight line law
- 2. ✖ Parabolic law
- 3. ✖ Hyperbolic law
- 4. ✔ Logarithmic law

Question Number : 31 Question Id : 1051315431 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For a centrifugal pump with a specific impeller diameter, operating at a fixed speed and handling a fluid of constant density

Options :

- 1. ✖ NPSH required decreases with increase in the capacity
- 2. ✖ NPSH available increases with increase in the capacity
- 3. ✔ NPSH required increases with increase in the capacity
- 4. ✖ NPSH required and NPSH available both increase with increase in the capacity

Question Number : 32 Question Id : 1051315432 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Fluids which show an apparent increase in viscosity with time are called

Options :

1. ✖ rheopectic
2. ✔ thixotropic
3. ✖ ideal fluid
4. ✖ dilatant fluid

Question Number : 33 Question Id : 1051315433 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Cavitation can be prevented by

Options :

1. ✖ suitably designing the pump
2. ✔ maintaining the suction head sufficiently greater than the vapor pressure
3. ✖ maintaining the suction head equal to developed head
4. ✖ maintaining the suction head lower than the vapor pressure

Question Number : 34 Question Id : 1051315434 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A rotameter

Options :

1. ✔ Incurs constant and small permanent pressure drop
2. ✖ Incurs constant but very large permanent pressure drop
3. ✖ Is inaccurate for low flow rates

4. ✖ Need not be mounted always vertically

Question Number : 35 Question Id : 1051315435 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Weber number is the ratio of

Options :

1. ✖ Surface tension forces to pressure forces
2. ✔ Inertial forces to Surface tension forces
3. ✖ Pressure forces to viscous forces
4. ✖ Viscous forces to gravity forces

Question Number : 36 Question Id : 1051315436 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For continuous reverse air cleaning in a fabric filter, gas-to-fabric ratio normally varies from

Options :

1. ✔ 8 to 15 cfm/sq ft
2. ✖ 0.2 to 0.5 cfm/sq ft
3. ✖ 50 to 60 cfm/sq ft
4. ✖ 0.01 to 0.1 cfm/sq ft

Question Number : 37 Question Id : 1051315437 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Sorting classifier uses a sink-and-float method to separate particles based on the

Options :

1. ✖ Particle size
2. ✖ Difference in terminal velocities
3. ✔ Difference in the densities of the particles
4. ✖ Centrifugal force

Question Number : 38 Question Id : 1051315438 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

During size reduction, the optimum speed of ball mill must be

Options :

1. ✖ 10 -15% of critical speed
2. ✖ 30 -35% of critical speed
3. ✔ 50 - 75% of the critical speed
4. ✖ more than 90% of critical speed

Question Number : 39 Question Id : 1051315439 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a gyratory crusher, the size reduction is effected primarily by

Options :

1. ✖ Attrition
2. ✔ Compression
3. ✖ Impact
4. ✖ Cutting action

Question Number : 40 Question Id : 1051315440 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the frequency of the stirrer in a mixing tank is increased by a factor of 2 while all other parameters are kept constant, by what factor is the power requirement increased at high Reynolds number?

Options :

1. ✖ 4
2. ✔ 8
3. ✖ 16
4. ✖ 32

Question Number : 41 Question Id : 1051315441 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Crushing efficiency is the ratio of

Options :

1. ✔ Surface energy created by the crushing to the energy absorbed by the solid
2. ✖ The energy absorbed by the solid to that fed to the machine
3. ✖ The energy fed to the machine to the surface energy created by the crushing
4. ✖ The energy absorbed by the solid to the surface energy created by the crushing

Question Number : 42 Question Id : 1051315442 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a fertilizer plant, in which of the following equipment, molten ammonium nitrate is mixed with ground lime-stone

Options :

1. ✔ Pug mill

2. ✖ Mixer-extruder
3. ✖ Banbury mixer
4. ✖ Muller mixer

Question Number : 43 Question Id : 1051315443 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In continuous filtration (at a constant pressure drop), filtrate flow rate varies inversely as

Options :

1. ✔ The square root of the velocity
2. ✖ The square of viscosity
3. ✖ The filtration time only
4. ✖ The washing time only

Question Number : 44 Question Id : 1051315444 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following is valid for a laminar flow of filtrate through a cake deposited on septum?

Options :

1. ✔ Kozney-Carman equation
2. ✖ Leva's equation
3. ✖ Blake-Plummer equation
4. ✖ Hagen – Poiseuille equation

Question Number : 45 Question Id : 1051315445 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The most efficient equipment for removal of sub-micron dust particles from blast furnace gas is

Options :

1. ✖ Venture atomiser
2. ✖ Gravity settling chamber
3. ✔ Electro-static precipitator
4. ✖ Cyclone separator

Question Number : 46 Question Id : 1051315446 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a feed forward multiple effect evaporator unit

Options :

1. ✖ Viscosity of liquid is highest in first effect
2. ✖ Transfer from effect to effect is done by pumps
3. ✖ No pump is required to withdraw the product from the last effect
4. ✔ Operates at decreasing pressures in each stage

Question Number : 47 Question Id : 1051315447 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Baffles in the shell side of a shell and tube heat exchanger

Options :

1. ✖ Increase the cross-section of the shell side liquid
2. ✖ Force the liquid to flow parallel to the bank

3. ✓ Increase the shell side heat transfer co-efficient
4. ✗ Decrease the shell side heat transfer co-efficient

Question Number : 48 Question Id : 1051315448 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The thermal conductivity is minimum for

Options :

1. ✗ Copper
2. ✗ Water
3. ✗ Silver
4. ✓ Air

Question Number : 49 Question Id : 1051315449 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a heat exchanger, floating head is provided to

Options :

1. ✗ Facilitate cleaning of the exchanger
2. ✗ Increase the heat transfer area
3. ✗ Increase the log mean temperature gradient
4. ✓ Relieve stresses caused by thermal expansion

Question Number : 50 Question Id : 1051315450 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

LMTD for counter flow and parallel flow heat exchanger will be the same, when

Options :

1. ✖ A cold fluid is heated to a certain temperature by condensing steam (isothermal fluid)
2. ✖ The outlet temperature of both the hot and cold fluids are same
3. ✖ The outlet temperature of hot fluid is less than the outlet temperature of the cold fluid
4. ✔ One of the fluids undergoes a phase change

Question Number : 51 Question Id : 1051315451 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For a blackbody, the wavelength at which the maximum monochromatic emissive power occurs is

Options :

1. ✖ Independent of the absolute temperature of the blackbody
2. ✖ Directly proportional to absolute temperature of the blackbody
3. ✔ Inversely proportional to the absolute temperature of the blackbody
4. ✖ Proportional to the fourth power of the absolute temperature of the blackbody

Question Number : 52 Question Id : 1051315452 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A composite wall consists of two plates A and B placed in series normal to the flow of heat. The thermal conductivities are k_A and k_B and the specific heat capacities are C_{pA} and C_{pB} , for plates A and B respectively. Plate B has twice the thickness of plate A. At steady state, the temperature difference across plate A is greater than that across plate B when

Options :

1. ✖ $C_{pA} > C_{pB}$

2. ✖ $C_{pA} < C_{pB}$
3. ✔ $k_A < 0.5 k_B$
4. ✖ $k_A > 2 k_B$

Question Number : 53 Question Id : 1051315453 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For laminar film condensation on vertical surface, the film thickness

Options :

1. ✖ cumulatively decreases from top to bottom
2. ✔ cumulatively increases from top to bottom
3. ✖ the surface conductance increase from top to bottom
4. ✖ remains constant from top to bottom

Question Number : 54 Question Id : 1051315454 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the baffle spacing in a shell and tube heat exchanger increases, then the Reynolds number of the shell side fluid

Options :

1. ✖ Remains unchanged
2. ✖ Increases
3. ✖ Increases or decreases depending on number of shell passes
4. ✔ Decreases

Question Number : 55 Question Id : 1051315455 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Sieder-Tate correlation for heat transfer in turbulent flow in a pipe gives

$Nu \propto Re^{0.8}$, where Nu is the Nusselt number and Re is the Reynolds number for the flow. Assuming that this relation is valid, the heat transfer coefficient varies with the pipe diameter (D) as

Options :

1. ✖ $D^{-1.8}$
2. ✔ $D^{-0.2}$
3. ✖ $D^{0.2}$
4. ✖ $D^{1.8}$

Question Number : 56 Question Id : 1051315456 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Prandtl number in heat transfer is analogous to the following dimensionless number in mass transfer

Options :

1. ✖ Stanton number
2. ✔ Schmidt number
3. ✖ Sherwood number
4. ✖ Peclet number

Question Number : 57 Question Id : 1051315457 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Unsaturated air (with dry bulb temperature and dew point being 35°C and 18°C respectively) is passed through a water spray chamber maintained at 15°C . The air will be

Options :

1. ✖ Cooled and humidified
2. ✖ Cooled and dehumidified with increase in wet bulb temperature
3. ✖ Cooled at the same relative humidity
4. ✔ Cooled and dehumidified with decrease in wet bulb temperature

Question Number : 58 Question Id : 1051315458 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following forms minimum boiling azeotrope at one atmosphere?

Options :

1. ✖ acetone- chloroform
2. ✖ benzene-toluene
3. ✖ hydrochloric acid-water
4. ✔ ethanol-water

Question Number : 59 Question Id : 1051315459 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A batch of material is dried under constant drying conditions. When drying is taking place from all the surfaces, the rate of drying during the constant rate period is

Options :

1. ✖ Directly proportional to the solid thickness
2. ✖ Inversely proportional to the solid thickness

3. ✓ Independent of solid thickness
4. ✗ Directly proportional to the square of solid thickness

Question Number : 60 Question Id : 1051315460 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following tray gives greatest flexibility in distillation column?

Options :

1. ✗ Bubble cap tray
2. ✓ Valve tray
3. ✗ Sieve tray
4. ✗ Linde tray

Question Number : 61 Question Id : 1051315461 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The dew point of an unsaturated mixture of water vapour and air at constant temperature and pressure

Options :

1. ✗ Does not change with change in absolute humidity
2. ✓ Increases with increase in absolute humidity
3. ✗ Decreases with increase in absolute humidity
4. ✗ Decreases linearly with increase in absolute humidity

Question Number : 62 Question Id : 1051315462 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

An azeotropic mixture of two liquids has boiling point higher than either of them when it

Options :

1. ✖ is saturated
2. ✔ shows negative deviation from Raoult's law
3. ✖ shows positive deviation from Raoult's law
4. ✖ shows no deviation from Raoult's law

Question Number : 63 Question Id : 1051315463 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If there is condensation of carrier steam in the steam distillation of high-boiling organic materials, then

Options :

1. ✖ Both temperature and pressure must be fixed
2. ✔ Either the temperature or the pressure may be fixed
3. ✖ The temperature is always more than 100°C at 1 atm
4. ✖ The temperature is always equal to 100°C at 1 atm

Question Number : 64 Question Id : 1051315464 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The reason for referring packed towers over plate towers in distillation practice is that the packed tower operation gives

Options :

1. ✖ low pressure drop and high hold up
2. ✖ high pressure drop and low hold up
3. ✔ low pressure drop and low hold up

4. ✖ high pressure drop and high hold up

Question Number : 65 Question Id : 1051315465 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In binary distillation, the number of bubble cap per tray primarily depends on

Options :

1. ✔ Allowable gas velocity
2. ✖ Allowable liquid velocity
3. ✖ Tray spacing
4. ✖ Feed composition

Question Number : 66 Question Id : 1051315466 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In distillation column design, the McCabe-Thiele procedure is inadequate and Ponchon- Savarit procedure is needed when

Options :

1. ✖ saturated feed is not used
2. ✖ an azeotrope forms
3. ✔ the latent heats of vaporization of the more and less volatile components are greatly different
4. ✖ a total condenser is used

Question Number : 67 Question Id : 1051315467 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In an inter-phase mass transfer process, the lesser the solubility of a given solute in a liquid, the higher are the chances that the transfer process will be

Options :

1. ✓ liquid phase resistance controlled
2. ✗ gas phase resistance controlled
3. ✗ impossible
4. ✗ driven by a non-linear driving force

Question Number : 68 Question Id : 1051315468 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In an absorber the equilibrium curve is always

Options :

1. ✗ Parallel to the operating line
2. ✗ Above the operating line
3. ✓ Below the operating line
4. ✗ Coincides with the operating line

Question Number : 69 Question Id : 1051315469 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The individual mass transfer coefficients ($\text{mol/m}^2\cdot\text{s}$) for absorption of a solute from a gas mixture into a liquid solvent are $k_L = 4.5$ and $k_G = 1.5$. The slope of the equilibrium line is 3. Which one of the following resistance(s) is/are controlling?

Options :

1. ✗ Liquid - side
2. ✗ Gas - side

- 3. ✖ Interfacial
- 4. ✔ Both liquid and gas-sides

Question Number : 70 Question Id : 1051315470 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The molecular diffusivity of a liquid

Options :

- 1. ✖ decreases with temperature
- 2. ✔ increases with temperature
- 3. ✖ may increase or decrease with temperature
- 4. ✖ is independent of temperature

Question Number : 71 Question Id : 1051315471 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A space time of 3 hours for a flow reactor means that

Options :

The time required to process one reactor volume of feed (measured at specified

- 1. ✔ conditions) is 3 hours
- 2. ✖ Three reactor volumes of feed can be processed every hour
- 3. ✖ It takes three hours to dump the entire volume of the reactor with feed
- 4. ✖ Conversion is 100% after three hours

Question Number : 72 Question Id : 1051315472 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For all positive reaction orders and for a given reactor duty,

Options :

1. ✓ Mixed reactor is always larger than the plug-flow reactor
2. ✗ The ratio of the volume of the mixed reactor to that of the plug-flow reactor decreases with order
3. ✗ Reactor size is independent of the type of flow
4. ✗ Density variation during reaction affects design

Question Number : 73 Question Id : 1051315473 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following fixes the volume of batch reactor for a particular conversion and production rate?

Options :

1. ✗ Operating conditions like pressure and temperature
2. ✗ Rate constant
3. ✓ Density of mixture
4. ✗ Catalyst

Question Number : 74 Question Id : 1051315474 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For a highly exothermic, solid-catalysed reaction, what reactor configuration should be used to achieve high conversion?

Options :

1. ✗ Fixed bed reactor
2. ✓ Fluidised bed reactor followed by a fixed bed reactor

3. ✖ Fixed bed reactor followed by a fluidised bed reactor
4. ✖ Fluidised bed reactor

Question Number : 75 Question Id : 1051315475 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The catalyst in a second order reversible reaction increases the rate of the

Options :

1. ✖ Forward reaction and decreases that of backward reaction
2. ✔ Forward and backward reactions equally
3. ✖ Forward reaction only
4. ✖ Forward reaction to a greater extent than that of the backward reaction

Question Number : 76 Question Id : 1051315476 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The unit of frequency factor in Arrhenius equation is

Options :

1. ✔ same as that of rate constant
2. ✖ same as that of activation energy
3. ✖ Dimensionless
4. ✖ inverse of that of rate constant

Question Number : 77 Question Id : 1051315477 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For Arrhenius model of the rate constant $k = k_0^{-E/RT}$, the graph drawn between

$\ln(k)$ versus $\frac{1}{T}$ gives the slope of

Options :

1. ✖ $\frac{E}{R}$

2. ✔ $-\frac{E}{R}$

3. ✖ $\frac{R}{E}$

4. ✖ $-\frac{R}{E}$

Question Number : 78 Question Id : 1051315478 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The gas phase reaction $A \rightarrow B + C$ is carried out in an ideal PFR achieving 40% conversion of A. The feed has 70 mole % A and 30% inerts. The inlet temperature is 300 K and the outlet temperature is 400 K. The ratio of the outlet to inlet molar concentration of A (assuming ideal gas mixture and uniform pressure) is

Options :

1. ✖ 0.60

2. ✖ 0.30

3. ✖ 0.40

4. ✔ 0.35

Question Number : 79 Question Id : 1051315479 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In solid catalysed reactions, the diffusional effects are more likely to affect the overall rate of reaction for

Options :

1. ✓ Fast reactions in catalyst of small pore diameter
2. ✗ Fast reactions in catalyst of large pore diameter
3. ✗ Slow reactions in catalyst of small pore diameter
4. ✗ Slow reactions in catalyst of large pore diameter

Question Number : 80 Question Id : 1051315480 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Molecularity of a reaction

Options :

1. ✗ is always equal to the overall order of the reaction
2. ✗ refers to the empirically found rate constant
3. ✓ cannot have a fractional value
4. ✗ refers only to non-elementary reaction

Question Number : 81 Question Id : 1051315481 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A pulse tracer is introduced in an ideal CSTR (with a mean residence time T) at time = 0. The time taken for the exit concentration of the tracer to reach half of its initial value will be

Options :

1. ✗ $2T$
2. ✗ $0.5T$

3. ✖ $\frac{T}{0.693}$

4. ✔ $0.693 T$

Question Number : 82 Question Id : 1051315482 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The E-curve for a non-ideal reactor defines the fraction of fluid having age between t and $t + dt$

Options :

1. ✖ At the inlet

2. ✔ At the outlet

3. ✖ In the reactor

4. ✖ Averaged over the inlet and outlet

Question Number : 83 Question Id : 1051315483 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A reaction in which one of the products of the reaction acts as a catalyst is called

Options :

1. ✖ a catalytic reaction

2. ✖ a photochemical reaction

3. ✔ an autocatalytic reaction

4. ✖ a biochemical reaction

Question Number : 84 Question Id : 1051315484 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The rate of reaction of any component is a function of

Options :

1. ✖ Temperature of the system only
2. ✖ Pressure of the system only
3. ✖ Composition of the component only
4. ✔ Temperature, pressure and composition

Question Number : 85 Question Id : 1051315485 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For the irreversible unimolecular first-order type reaction

Options :

1. ✔ The fractional conversion at any time is same for constant volume systems and variable systems
2. ✖ The fractional conversion at any time is more for constant volume systems than variable-volume systems
3. ✖ The fractional conversion at any time is less for constant volume systems than variable-volume systems
4. ✖ The concentration of reaction at any reactant at any time is same for constant-volume systems and variable-volume systems.

Question Number : 86 Question Id : 1051315486 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following is a first-order instrument?

Options :

1. ✖ U-tube type mercury manometer
2. ✖

Bimetallic thermometer with covering

3. ✓ Vapour pressure thermometer without any covering

4. ✗ Mercury thermometer with covering

Question Number : 87 Question Id : 1051315487 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following is the most suitable to measure a temperature of 2000 °C?

Options :

1. ✗ Ordinary mercury-in-glass thermometer

2. ✗ Platinum resistance thermometer

3. ✓ Radiation pyrometer

4. ✗ Constant-volume hydrogen thermometer

Question Number : 88 Question Id : 1051315488 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Ordinary mercury-in-glass thermometer works on the principle of

Options :

1. ✓ Volumetric expansion of mercury with increase in temperature

2. ✗ Increase of vapour pressure with increase in temperature

3. ✗ Increase of electrical resistance with increase in temperature

4. ✗ Decrease of vapour pressure with increase in temperature

Question Number : 89 Question Id : 1051315489 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In thermistors, the resistance

Options :

1. ✖ Remains unaffected with change in temperature
2. ✖ Increases with increase in temperature
3. ✖ Increases linearly with increase in temperature
4. ✔ Decreases with increase in temperature

Question Number : 90 Question Id : 1051315490 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Manipulated variable in water heater is

Options :

1. ✖ Flow rate of water
2. ✖ Temperature of outlet water
3. ✔ Heat input
4. ✖ Inlet temperature of water

Question Number : 91 Question Id : 1051315491 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If response of a control system is to be free of offset and oscillation, then the most suitable controller is

Options :

1. ✖ Proportional controller
2. ✖ Proportional-derivative (PD) controller
3. ✖ Proportional-integral (PI) controller

4. ✓ Proportional integral-derivative (PID) controller

Question Number : 92 Question Id : 1051315492 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A first order system with a time constant of 1 minute is subjected to frequency response analysis. At an input frequency of 1 radian / minute, the phase shift is

Options :

1. ✗ 45°
2. ✗ -90°
3. ✗ -180°
4. ✓ -45°

Question Number : 93 Question Id : 1051315493 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Select the correct statement from the following

Options :

1. ✗ The frequency response of a pure capacity process is unbounded
2. ✗ The phase lag of a pure time delay system decrease with increasing frequency
3. ✓ The amplitude ratio of a pure capacity process is inversely proportional to the frequency
4. ✗ The amplitude ratio of a pure time delay system increases with frequency

Question Number : 94 Question Id : 1051315494 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A typical example of a physical system with second order under-damped characteristics is a

Options :

1. ✓ U-tube manometer
2. ✗ Spring – loaded diaphragm valve
3. ✗ CSTR with first order reaction
4. ✗ Thermocouple kept immersed in a liquid filled thermal well

Question Number : 95 Question Id : 1051315495 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The closed loop poles of a stable second order system could be

Options :

1. ✗ Real and positive
2. ✗ Complex conjugate with positive real part
3. ✓ Real and negative
4. ✗ One real positive and the other real negative

Question Number : 96 Question Id : 1051315496 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Temperature control of an exothermic chemical reaction taking place in a CSTR is done with the help of cooling water flowing in a jacket around the reactor. The types of valve and controller action to be recommended are

Options :

1. ✗ Air to open valve with the controller direct acting
2. ✓ Air to close valve with the controller indirect acting
3. ✗ Air to open valve with the controller indirect acting

4. ✖ Air to close valve with the controller direct acting

Question Number : 97 Question Id : 1051315497 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The value of ultimate period of oscillation P_u is 3 minutes and that of the ultimate controller gain K_u is 2. Select the correct set of tuning parameters (controller gain K_c , the derivative time constant T_D in minutes and the integral time constant T_I in minutes) for a PID controller using Ziegler-Nichols controller settings

Options :

1. ✖ $K_c = 1.1, T_I = 2.1, T_D = 1.31$

2. ✖ $K_c = 1.5, T_I = 1.8, T_D = 0.51$

3. ✖ $K_c = 15, T_I = 1.8, T_D = 0.51$

4. ✔ $K_c = 1.2, T_I = 1.5, T_D = 0.38$

Question Number : 98 Question Id : 1051315498 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Laplace transform of the function $f(t) = 3t$ is

Options :

1. ✖ $\frac{3}{s^3}$

2. ✖ $\frac{3}{s^4}$

3. ✔ $\frac{3}{s^2}$

4. ✖ $\frac{3}{s}$

Question Number : 99 Question Id : 1051315499 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is a condition for a stable feedback control system?

Options :

1. ✖ Roots of the characteristic equation should be real
2. ✔ Poles of the closed loop transfer function should lie in the left half of the complex plane
3. ✖ Bode plots of the corresponding open loop transfer function should monotonically decrease
4. ✖ Poles of the closed loop transfer function should lie in the right half of the complex plane

Question Number : 100 Question Id : 1051315500 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match the first order system given with the appropriate time constant shown in Table

First order system		Appropriate time constant (T)	
P	Thermometer	1	$(mC_p) / (hA)$
Q	Mixing process	2	RC
R	Liquid level system	3	V / q
S	RC circuit	4	AR

Options :

1. ✖ P-4, Q-2, R-3, S-1
2. ✖ P-4, Q-3, R-1, S-2
3. ✖ P-1, Q-2, R-3, S-4
4. ✔ P-1, Q-3, R-4, S-2

Question Number : 101 Question Id : 1051315501 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes**Correct Marks : 1 Wrong Marks : 0**

If 'S' is the amount available for 'n' interest periods for an initial principal 'P' with the discrete compound interest rate 'i', the present worth is given by

Options :

1. ✖ $\frac{(1+i)^n}{S}$

2. ✖ $\frac{S}{(1+i)^n}$

3. ✖ $\frac{S}{(1+in)}$

4. ✔ $\frac{S}{(1+n)^i}$

Question Number : 102 Question Id : 1051315502 Question Type : MCQ Option Shuffling : Yes**Display Question Number : Yes****Correct Marks : 1 Wrong Marks : 0**

In plant design, 'de-bottlenecking' refers to

Options :

1. ✔ Increasing capacity of the limiting process step

2. ✖ Reducing labour costs

3. ✖ Adding new reactors

4. ✖ Changing the product specification

Question Number : 103 Question Id : 1051315503 Question Type : MCQ Option Shuffling : Yes**Display Question Number : Yes****Correct Marks : 1 Wrong Marks : 0**

The nominal and effective interest rates are equal when the interest is compounded

Options :

1. ✖ monthly
2. ✖ continuously
3. ✖ semi annually
4. ✔ annually

Question Number : 104 Question Id : 1051315504 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The 'Payout Time' or 'Payback Period' is best defined as

Options :

1. ✖ Time to recover total capital investment from profit
2. ✔ Time to recover fixed capital investment from cumulative cash flow
3. ✖ Total project life divided by annual revenue
4. ✖ Time to reach break-even point after start-up

Question Number : 105 Question Id : 1051315505 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The 'six-tenths rule' is used to estimate

Options :

1. ✖ Equipment cost from size
2. ✔ Plant cost from capacity
3. ✖ Operating labor from production rate
4. ✖ Maintenance cost from equipment cost

Question Number : 106 Question Id : 1051315506 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Working capital is typically what percentage of total capital investment for a chemical process plant?

Options :

1. ✖ 5–10%
2. ✔ 10–20%
3. ✖ 30–50%
4. ✖ 50–70%

Question Number : 107 Question Id : 1051315507 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For preliminary estimates, the ratio of indirect costs to direct costs for chemical plants is often in the range

Options :

1. ✖ 0.1–0.3
2. ✖ 0.3–0.5
3. ✔ 0.5–0.8
4. ✖ 1.0–1.5

Question Number : 108 Question Id : 1051315508 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Discounted cash flow method is mainly used for

Options :

1. ✖ Depreciation

2. ✓ Profitability analysis
3. ✗ Payout period
4. ✗ Salvage value

Question Number : 109 Question Id : 1051315509 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For a typical project, the cumulative cash flow is zero at the

Options :

1. ✗ End of project life'
2. ✓ Break-even point
3. ✗ Start-up
4. ✗ Design stage

Question Number : 110 Question Id : 1051315510 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The 'salvage value' of equipment at the end of project life is

Options :

1. ✓ Considered a cash inflow in final year
2. ✗ Ignored in economic analysis
3. ✗ Part of working capital recovery
4. ✗ Added to annual depreciation

Question Number : 111 Question Id : 1051315511 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Comparing sulphate process with sulphite process it is found that

Options :

1. ✖ Both temperature and pressure in the former is less than that in the later
2. ✔ Both temperature and pressure in the former is more than that in the later
3. ✖ Temperature is more in the former whereas pressure is more in the later
4. ✖ Pressure is more in the former whereas temperature is less in the later

Question Number : 112 Question Id : 1051315512 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Styrene-Butadiene rubber is commercially manufactured by

Options :

1. ✖ Bulk polymerization
2. ✖ Suspension polymerization
3. ✖ Solution polymerization
4. ✔ Emulsion polymerization

Question Number : 113 Question Id : 1051315513 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Poly Tetra Fluoro Ethylene (PTFE) is known as

Options :

1. ✖ Bakelite
2. ✔ Teflon
3. ✖ Celluloid

4. ✖ Dacron**Question Number : 114 Question Id : 1051315514 Question Type : MCQ Option Shuffling : Yes****Display Question Number : Yes****Correct Marks : 1 Wrong Marks : 0**

Sodium tripolyphosphate is mainly used in

Options :

1. ✖ Plastics
2. ✔ Detergents formulation
3. ✖ Mechanical industries
4. ✖ Fertilizers

Question Number : 115 Question Id : 1051315515 Question Type : MCQ Option Shuffling : Yes**Display Question Number : Yes****Correct Marks : 1 Wrong Marks : 0**

In petroleum refining, the process used for conversion of hydrocarbons to aromatics is called

Options :

1. ✖ catalytic cracking
2. ✔ catalytic reforming
3. ✖ hydrotreating
4. ✖ alkylation

Question Number : 116 Question Id : 1051315516 Question Type : MCQ Option Shuffling : Yes**Display Question Number : Yes****Correct Marks : 1 Wrong Marks : 0**

In catalytic cracking

Options :

1. ✖ Gasoline obtained has a very low octane number
2. ✖ Pressure and temperature is very high
3. ✔ Gasoline obtained has very high aromatic content
4. ✖ Gasoline obtained has very high amount of gum forming compounds

Question Number : 117 Question Id : 1051315517 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Excessive use of chemical fertilisers causes shrivelling of the roots and wilting of the plant because the

Options :

1. ✖ Osmotic pressure of the soil water becomes less than that of the plant sap
2. ✖ Soil becomes too alkaline
3. ✔ Osmotic pressure of the soil water becomes higher than that of the plant sap
4. ✖ Soil becomes too acidic

Question Number : 118 Question Id : 1051315518 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Black liquor is converted into the white liquor by

Options :

1. ✔ Evaporation and burning the concentrate followed by causticisation of products
2. ✖ Multi-effect evaporation only
3. ✖ Selective liquid extraction
4. ✖ Extractive distillation

Question Number : 119 Question Id : 1051315519 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Cooking conditions in Kraft pulp process are

Options :

1. ✓ Time 2-5 hrs, temperature 170-176°C and pressure 660-925 kPa
2. ✗ Time 6-12 hrs, temperature 125-160°C and pressure 620-755 kPa
3. ✗ Time 36-48 minutes, temperature 160-180°C and pressure 660-1100 kPa
4. ✗ Time 60-72 minutes, temperature 170-176°C and pressure 660-1100 kPa

Question Number : 120 Question Id : 1051315520 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Unsaturated oils compared to saturated oils have

Options :

1. ✓ Lower melting point and higher reactivity to oxygen
2. ✗ Higher melting point and higher reactivity to oxygen
3. ✗ Lower melting point and lower reactivity to oxygen
4. ✗ Higher melting point and lower reactivity to oxygen