

Andhra Pradesh State Council of Higher Education

Notations :

- 1.Options shown in green color and with ✓ icon are correct.
- 2.Options shown in red color and with ✗ icon are incorrect.

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| Question Paper Name : | Chemical Engineering 31st May 2024 Shift 1 |
| Duration : | 120 |
| Total Marks : | 120 |
| Display Marks: | No |
| Share Answer Key With Delivery Engine : | Yes |
| Calculator : | None |
| Magnifying Glass Required? : | No |
| Ruler Required? : | No |
| Eraser Required? : | No |
| Scratch Pad Required? : | No |
| Rough Sketch/Notepad Required? : | No |
| Protractor Required? : | No |
| Show Watermark on Console? : | Yes |
| Highlighter : | No |
| Auto Save on Console? | Yes |
| Change Font Color : | No |
| Change Background Color : | No |
| Change Theme : | No |
| Help Button : | No |
| Show Reports : | No |

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|-------------------------------|-----------|
| Show Progress Bar : | No |
| Is this Group for Examiner? : | No |
| Examiner permission : | Cant View |
| Show Progress Bar? : | No |

Chemical Engineering

| | |
|--|-----------|
| Section Id : | 33300853 |
| Section Number : | 1 |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 120 |
| Section Marks : | 120 |
| Enable Mark as Answered Mark for Review and Clear Response : | Yes |
| Maximum Instruction Time : | 0 |
| Is Section Default? : | null |

Question Number : 1 Question Id : 3330086241 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following states that the total pressure exerted by a gaseous mixture is equal to the sum of the partial pressures

Options :

1. ✘ Amagat's law
2. ✘ Raoult's law
3. ✔ Dalton's law

4. ✘ Avogadro's law

Question Number : 2 Question Id : 3330086242 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If air has 21% and 79% of Oxygen and Nitrogen by volume respectively. What is the average molecular weight?

Options :

1. ✘ 29.3

2. ✘ 29

3. ✔ 28.84

4. ✘ 28

Question Number : 3 Question Id : 3330086243 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An organic compound is found to contain C= 54.5%, O= 36.4% and H= 9.1% by weight. Its empirical formula is

Options :

1. ✘ CHO_2

2. ✔ $\text{C}_2\text{H}_4\text{O}$

3. ✖ C_2H_6O

4. ✖ C_3H_4O

Question Number : 4 Question Id : 3330086244 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Cox charts are plotted

Options :

Logarithm of vapour pressure of a substance versus logarithm of partial pressure of the reference substance

1. ✖

Logarithm of vapour pressure of a substance versus logarithm of the vapour pressure of reference substance

2. ✔

3. ✖ Logarithm of vapour pressure of a substance versus temperature

4. ✖ Logarithm of vapour pressure of a substance versus partial pressure

Question Number : 5 Question Id : 3330086245 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The number of degrees of freedom for a mixture of liquid water and liquid toluene (immiscible in water) in equilibrium with their vapours is

Options :

1. ✘ 3

2. ✘ 2

3. ✔ 1

4. ✘ 0

Question Number : 6 Question Id : 3330086246 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The solubility of sodium chloride in water at 290K is 35.8 kg/100kg water. What is the mass fraction of Sodium Chloride in solution?

Options :

1. ✔ 0.264

2. ✘ 0.358

3. ✘ 0.642

4. ✘ 0.736

Question Number : 7 Question Id : 3330086247 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ratio of moles of the reactant converted to the desired product and moles of the reactant converted to undesired product is called as

Options :

1. ✘ Conversion
2. ✔ Selectivity
3. ✘ Reaction yield
4. ✘ Plant yield

Question Number : 8 Question Id : 3330086248 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A Recycle ratio is defined as

Options :

1. ✔ Recycle stream/fresh feed stream
2. ✘ Recycle stream/gross feed stream
3. ✘ Gross feed stream/ recycle stream
4. ✘ Fresh feed stream/recycle stream

Question Number : 9 Question Id : 3330086249 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In which of the following process involving an ideal gas, the change in internal energy and the change in enthalpy would be zero.

Options :

1. ✘ Isobaric process
2. ✔ Isothermal process
3. ✘ Adiabatic process
4. ✘ Polytropic process

Question Number : 10 Question Id : 3330086250 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Vander Waals equation of state is given by

Options :

1. ✘
$$P = \frac{RT}{(v - b)} - \frac{a}{T^{0.5}v(v + b)}$$

2. ✔
$$P = \frac{RT}{(v - b)} - \frac{a}{v^2}$$

3. ✘

$$P = \frac{RT}{(v-b)} - \frac{a'(T)}{v(v+b)}$$

$$P = \frac{RT}{(v-b)} - \frac{a \propto}{v(v+b) + b(v-b)}$$

4. ✘

Question Number : 11 Question Id : 3330086251 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Entropy of a system is

Options :

1. ✔ A measure of disorder of the system
2. ✘ A measure of orderly behaviour of the system
3. ✘ Independent of Temperature
4. ✘ Independent of Pressure

Question Number : 12 Question Id : 3330086252 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When the reactants and products are at their standard states, the change in enthalpy accompanying the formation of 1 mole of a substance from the constituent elements is termed as

Options :

1.

- ✘ The standard heat of reaction
2. ✓ The standard heat of formation
3. ✘ The standard heat of combustion
4. ✘ The standard heat of accumulation

Question Number : 13 Question Id : 3330086253 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Carnot cycle consists of an alternate series of

Options :

1. ✓ Two reversible isothermal processes and two reversible adiabatic processes
2. ✘ Two reversible isobaric processes and two reversible adiabatic processes
3. ✘ Two reversible isothermal processes and two reversible isobaric processes
4. ✘ Two reversible isothermal processes and two polytropic processes

Question Number : 14 Question Id : 3330086254 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For an ideal gas mixture, the fugacity of a component is equal to

Options :

1. ✘ Vapour pressure of that component
2. ✔ Partial pressure of the component
3. ✘ The total pressure of the mixture
4. ✘ The vapour pressure of the component at STP

Question Number : 15 Question Id : 3330086255 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For an ideal gas mixture undergoing a reversible gaseous phase chemical reaction, the equilibrium constant

Options :

1. ✘ Decreases with pressure
2. ✘ Increases with pressure
3. ✔ Is independent of pressure
4. ✘ Increases/decreases with pressure depending on the stoichiometric coefficients of the reaction

Question Number : 16 Question Id : 3330086256 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

The Gibbs free energy change (ΔG°) and equilibrium constant (K) for a chemical reaction are related by

Options :

1. ✘ $\Delta G^\circ = RT \ln K$

2. ✘ $\Delta G^\circ = T \ln K$

3. ✘ $\Delta G^\circ = RTK$

4. ✔ $\Delta G^\circ = -RT \ln K$

Question Number : 17 Question Id : 3330086257 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

An ideal fluid is the one which

Options :

1. ✘ Offers resistance to flow

2. ✘ Offers resistance to deformation

3. ✔ Has no viscosity

4. ✘ Has infinity viscosity

Question Number : 18 Question Id : 3330086258 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The flow of incompressible fluids without the presence of shear is referred to as

Options :

1. ✓ Potential flow
2. ✗ Turbulent flow
3. ✗ Laminar flow
4. ✗ Fully developed flow

Question Number : 19 Question Id : 3330086259 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Bernoulli equation states that in a steady irrotational flow of an incompressible fluid,

Options :

1. ✗ The total potential energy at any point is constant
2. ✗ The total kinetic energy at any point is constant
3. ✓ The total energy at any point is constant.
4. ✗ The total pressure energy at any point is constant

Question Number : 20 Question Id : 3330086260 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When the flow of a fluid through a circular pipe, the friction factor is

Options :

1. ✓ $f = \frac{16}{N_{Re}}$

2. ✗ $f = \frac{24}{N_{Re}}$

3. ✗ $f = 0.079N_{Re}^{-1/2}$

4. ✗ $f = 0.079N_{Re}^{-1/4}$

Question Number : 21 Question Id : 3330086261 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Pitot tube is used for measuring

Options :

1. ✗ Total fluid velocity

2. ✓ Local fluid velocity

3. ✘ Average velocity

4. ✘ Maximum fluid velocity

Question Number : 22 Question Id : 3330086262 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Kozney Carman equation is used for finding

Options :

1. ✘ Volumetric flow rate through a pipe line

2. ✘ Velocity of fluids through a duct

3. ✔ Pressure drop through a packed bed

4. ✘ Pressure drop through a fluidized bed

Question Number : 23 Question Id : 3330086263 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In which of the following pumps, the displacement of fluid is by rotating action

Options :

1. ✘ Centrifugal pump

2. ✔ Gear pump

3. ✘ Plunger pump

4. ✘ Piston pump

Question Number : 24 Question Id : 3330086264 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following happens when the gas velocity increases in fluidization?

Options :

1. ✘ Bulk density of the bed increases and fluidization become less aggressive
2. ✘ Bulk density of the bed decreases and fluidization become less aggressive
3. ✘ Bulk density of the bed increases and fluidization become more aggressive
4. ✔ Bulk density of the bed decreases and fluidization become more aggressive

Question Number : 25 Question Id : 3330086265 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

100-mesh screen means

Options :

1. ✘ 100 little square openings per one linear cm of screen
2. ✘ 100 little square openings per one linear mm of screen

3. ✓ 100 little square openings per one linear inch of screen

4. ✘ 100 little square openings per one linear feet of screen

Question Number : 26 Question Id : 3330086266 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The work required for crushing a given material is proportional to the logarithm of the ratio between the initial and final diameters is a statement of

Options :

1. ✘ Rittinger's law

2. ✓ Kick's law

3. ✘ Bond's law

4. ✘ Fick's law

Question Number : 27 Question Id : 3330086267 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a ball mill, centrifugal force will be exactly balanced by the weight of the ball when mill runs at

Options :

1. ✘ Minimum speed

2. ✘ Maximum speed
3. ✔ Critical speed
4. ✘ Optimum speed

Question Number : 28 Question Id : 3330086268 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The mass of material that can be fed per unit time to a unit area of the screen is called as

Options :

1. ✘ Effectiveness of the screen
2. ✔ Capacity of the screen
3. ✘ Ability of the screen
4. ✘ Productivity of the screen

Question Number : 29 Question Id : 3330086269 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a process of gravity concentration where solids are separated based upon the differences in the behavior of particles through a moving fluid which in turn, depends upon densities/specific gravities.

Options :

1. ✘ Classification
2. ✘ Sedimentation
3. ✘ Centrifugation
4. ✔ Jigging

Question Number : 30 Question Id : 3330086270 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The filter aid is a granular or fibrous material and is used to

Options :

1. ✘ Increase the cake resistance
2. ✔ Increase the cake porosity
3. ✘ Increase the pressure drop across the cake
4. ✘ Increase the filter medium resistance

Question Number : 31 Question Id : 3330086271 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A fluid energy mill is used for

Options :

1. ✘ Cutting
2. ✘ Grinding
3. ✔ Ultra-grinding
4. ✘ Crushing

Question Number : 32 Question Id : 3330086272 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a batch thickener, the rate of sedimentation can be artificially increased by

Options :

1. ✔ The addition of coagulating agents
2. ✘ Cooling the suspension to room temperature
3. ✘ Promoting the free settling
4. ✘ Controlling the flow rate

Question Number : 33 Question Id : 3330086273 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The critical radius of insulation is

Options :

1. ✓ $\frac{\text{The thermal conductivity of an insulating material}}{\text{Heat transfer coefficient at the outer surface of insulation}}$
2. ✗ $\frac{\text{The thermal conductivity of metal to be insulated}}{\text{Heat transfer coefficient at the outer surface of insulation}}$
3. ✗ $\frac{\text{The thermal conductivity of an insulating material}}{\text{Heat transfer coefficient at the inside surface of insulation}}$
4. ✗ $\frac{\text{The thermal conductivity of metal to be insulated}}{\text{Heat transfer coefficient at the inside surface of insulation}}$

Question Number : 34 Question Id : 3330086274 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Peclet number is defined as the product of

Options :

1. ✗ The Reynolds number and Graetz number
2. ✗ The Prandtl number and Nusselt number
3. ✓ The Reynolds number and Prandtl number
4. ✗ The Reynolds number and Nusselt number

Question Number : 35 Question Id : 3330086275 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Ratio of emissive power of a body to the emissive power of a perfectly black body, is known as

Options :

1. ✓ Emissivity
2. ✗ Absorptivity
3. ✗ Transmissivity
4. ✗ Reflectivity

Question Number : 36 Question Id : 3330086276 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In shell and tube heat exchanger, steam is condensing on the shell side and a cold fluid is flowing through the tubes in the turbulent flow region, then the Wilson plot is used to

Options :

1. ✗ The linear velocity of cold fluid
2. ✗ Overall temperature difference
3. ✗ Overall heat transfer coefficient

4. ✓ Film heat transfer coefficients

Question Number : 37 Question Id : 3330086277 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a heat exchanger, for the same terminal temperatures, the logarithmic mean temperature difference for counter flow is

Options :

1. ✓ Appreciable greater than that for co-current flow
2. ✗ Appreciable lower than that for co-current flow
3. ✗ Almost equal to that for co-current flow
4. ✗ Appreciable lower than that for cross flow

Question Number : 38 Question Id : 3330086278 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Dropwise condensation,

Options :

1. ✗ Requires smooth, clean uncontaminated surfaces
2. ✗ Is stable and easy to maintain
3. ✓ Have higher heat transfer coefficients

4. ✘ Heat lower heat transfer coefficients

Question Number : 39 Question Id : 3330086279 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

As per the Stefan-Boltzmann law the total energy emitted by a black body is directly proportional to

Options :

1. ✘ The third power of its absolute temperature
2. ✔ The fourth power of its absolute temperature
3. ✘ The fifth power of its absolute temperature
4. ✘ The sixth power of its absolute temperature

Question Number : 40 Question Id : 3330086280 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Shell and Tube heat exchanger, external cleaning of the tubes is easy in case of

Options :

1. ✘ Equilateral triangular pitch arrangement of tube layout
2. ✘ Right angle triangular pitch arrangement of tube layout
3. ✔ Square pitch arrangement of tube layout

4. ✘ Hexagonal pitch arrangement of tube layout

Question Number : 41 Question Id : 3330086281 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Use of multiple effect evaporator results in

Options :

1. ✘ Increase in steam economy only

2. ✘ Decreases steam economy only

3. ✘ Increasing evaporating capacity only

4. ✔ Increase in both steam economy and evaporating capacity

Question Number : 42 Question Id : 3330086282 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The heat flux in the nucleate boiling regimes is proportional to

Options :

1. ✘ $(\Delta T)^2$

2. ✘ $(\Delta T)^4$

3. ✓ $(\Delta T)^3$

4. ✗ $\sqrt{\Delta T}$

Question Number : 43 Question Id : 3330086283 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The steady state gas phase reaction $3A + B = C + 2D$ takes place on a catalyst surface. What will be the value of the flux ratio N_A/N_D ?

Options :

1. ✗ -2

2. ✗ -0.5

3. ✓ -1.5

4. ✗ 2

Question Number : 44 Question Id : 3330086284 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Lewis number is the ratio of

Options :

1. ✓ Thermal diffusivity to mass diffusivity

2. ✘ Mass diffusivity to momentum diffusivity

3. ✘ Mass diffusivity to thermal diffusivity

4. ✘ Momentum diffusivity to thermal diffusivity

Question Number : 45 Question Id : 3330086285 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The penetration theory relates average mass transfer coefficient (k) with diffusivity (D) as

Options :

1. ✘ $k \propto D$

2. ✔ $k \propto \sqrt{D}$

3. ✘ $k \propto D^{1.5}$

4. ✘ $k \propto D^2$

Question Number : 46 Question Id : 3330086286 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The absorption factor can be increased by

Options :

1. ✘ Increasing both gas and solvent flow rates
2. ✘ Decreasing both gas and solvent flow rates
3. ✔ Decreasing gas flow rate and increasing solvent flow rate
4. ✘ Increasing gas flow rate and decreasing solvent flow rate

Question Number : 47 Question Id : 3330086287 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A plate is called a theoretical plate when

Options :

1. ✔ The vapour and liquid leaving the plate are in equilibrium
2. ✘ The vapour and liquid entering the plate are in equilibrium
3. ✘ The vapour leaving the plate is in equilibrium with the liquid entering the plate
4. ✘ The liquid leaving the plate is in equilibrium with the vapour entering the plate

Question Number : 48 Question Id : 3330086288 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If reflux in a distillation column is 100 mol/hr and the overhead product rate is 50 mol/hr, the reflux ratio is

Options :

1. ✘ 0.5

2. ✔ 2

3. ✘ 50

4. ✘ 150

Question Number : 49 Question Id : 3330086289 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

At a given temperature, the humid volume is

Options :

1. ✔ Linear function of humidity

2. ✘ Inverse function of humidity

3. ✘ Square function of humidity

4. ✘ No specific function of humidity

Question Number : 50 Question Id : 3330086290 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Liquid-Liquid Extraction, if the selectivity is unity, then

Options :

1. ✘ Separation of the components is most effective
2. ✔ No separation is possible
3. ✘ Amount of solvent requirement is minimum
4. ✘ Solvent flow rate should be very high

Question Number : 51 Question Id : 3330086291 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Higher temperature increases the rate of leaching in solid-liquid system due to

Options :

1. ✘ Increased liquid viscosity and decreased diffusivity
2. ✘ Increased liquid viscosity and increased diffusivity
3. ✘ Decreased liquid viscosity and decreased diffusivity
4. ✔ Decreased liquid viscosity and increased diffusivity

Question Number : 52 Question Id : 3330086292 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Moisture in a solid exerting an equilibrium vapour pressure equal to that of the pure liquid at that temperature is

Options :

1. ✘ Bound moisture
2. ✔ Unbound moisture
3. ✘ Critical moisture
4. ✘ Equilibrium moisture

Question Number : 53 Question Id : 3330086293 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In case of adsorption hysteresis, the desorption equilibrium pressure is

Options :

1. ✔ Always lower than that obtained during adsorption
2. ✘ Always higher than that obtained during adsorption
3. ✘ Same as that obtained during adsorption
4. ✘ Can be either higher or lower than that obtained during adsorption.

Question Number : 54 Question Id : 3330086294 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Flooding in a distillation column is detected by a sharp

Options :

1. ✘ Increase in Murphree plate efficiency
2. ✔ Increase in pressure drop
3. ✘ Decrease in pressure drop
4. ✘ Decrease in liquid holdup in the column

Question Number : 55 Question Id : 3330086295 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The activation energy at high temperatures is lower than at lower temperatures, which represents

Options :

1. ✔ Diffusion regime
2. ✘ Reaction regime
3. ✘ Kinetic regime
4. ✘ Intermediate regime

Question Number : 56 Question Id : 3330086296 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A reaction is of zero order when the rate of reaction is

Options :

1. ✘ Directly proportional to the concentration of reactant
2. ✘ Inversely proportional to the concentration of reactant
3. ✔ Independent of the concentration of reactant
4. ✘ Independent of temperature and pressure

Question Number : 57 Question Id : 3330086297 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The most suitable reactor to carry out an auto-thermal reaction is a

Options :

1. ✔ Back mix reactor
2. ✘ Plug-flow reactor
3. ✘ Batch reactor
4. ✘ Semi-batch reactor

Question Number : 58 Question Id : 3330086298 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a steady- state mixed reactor the space- time is equivalent to the holding time for

Options :

1. ✓ Constant fluid density systems
2. ✗ Variable fluid density systems
3. ✗ Non- isothermal gas reactions
4. ✗ Gas reactions with changing number of moles

Question Number : 59 Question Id : 3330086299 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For identical feed composition, flow rate, conversion and for all positive reaction orders the ratio of the volume of mixed reactor to the volume of plug flow reactor

Options :

1. ✗ Is independent of the order of reaction
2. ✓ Increases with increase in the order of reaction
3. ✗ Decreases with increase in the order of reaction
4. ✗ Increases with increase in the percentage of conversion

Question Number : 60 Question Id : 3330086300 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a semi- batch reactor

Options :

1. ✓ Rate of reaction can be controlled
2. ✗ Maximum conversion can be controlled
3. ✗ Both the reactants flow counter- currently
4. ✗ Residence time is constant

Question Number : 61 Question Id : 3330086301 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The best combination of reactors for an exothermic reaction is

Options :

1. ✗ A CSTR
2. ✗ CSTR in series
3. ✗ A Plug flow reactor followed by CSTR

4. ✓ CSTR followed by a Plug Flow Reactor

Question Number : 62 Question Id : 3330086302 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the conversion of a first-order liquid phase reaction occurring in a CSTR is 75%, molar feed rate is 5 mol/min, the rate of the reaction is $5 \frac{\text{mol}}{\text{litre.min}}$ then the volume of the reactor (in litre) is?

Options :

1. ✗ 0.33

2. ✗ 0.4

3. ✓ 0.75

4. ✗ 0.5

Question Number : 63 Question Id : 3330086303 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\tau = 5$ s, first order rate constant, $k = 0.25 \text{ sec}^{-1}$ and the number of tanks, N is 5, then the conversion is

Options :

1. ✗ 87.45%

2. ✗ 33%

3. ✘ 75%

4. ✔ 67.2%

Question Number : 64 Question Id : 3330086304 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is true for gas-phase reactions?

Options :

1. ✘ Decrease in moles of the product increases the volume of the reaction mixture
2. ✘ Increase in moles of the product does not affect the volume of the reaction mixture
3. ✔ Increase in moles of the product increases the volume of the reaction mixture
4. ✘ Increase in moles of the product decreases the volume of the reaction mixture

Question Number : 65 Question Id : 3330086305 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following represents heterogeneous catalytic reaction?

Options :

1. ✘ Reduction of iron ore
2. ✔ Ammonia synthesis

3. ✘ Burning of coal

4. ✘ Roasting of ores

Question Number : 66 Question Id : 3330086306 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the activity of a catalyst when a time $t = 0$?

Options :

1. ✔ Unity

2. ✘ Infinity

3. ✘ Zero

4. ✘ Negative

Question Number : 67 Question Id : 3330086307 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If an instrument produces same reading at different times for the same variation in the measured variable, then it is said to

Options :

1. ✘ Have no hysteresis

2. ✘ Have no accuracy

3. ✘ Have no dead zone

4. ✔ Have no drift

Question Number : 68 Question Id : 3330086308 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following pressure gauge operation depends on the variation of the thermal conductivity of a gas at low pressure,

Options :

1. ✘ Bourdon tube gauge

2. ✘ Hydrostatic gauge

3. ✔ Pirani gauge

4. ✘ McLeod gauge

Question Number : 69 Question Id : 3330086309 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following measuring device is not suitable for the measurement of the rate of flow of liquids

Options :

1. ✘ Nutating- Disc Meter
2. ✔ Hot-Wire Anemometer
3. ✘ Laser-Doppler Anemometer
4. ✘ Venturi Meter

Question Number : 70 Question Id : 3330086310 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Bourdon gauges are used for measurement of pressures

Options :

1. ✘ Local atmospheric pressures
2. ✘ Local absolute pressures
3. ✘ Low range vacuum pressures
4. ✔ Large range gauge pressures

Question Number : 71 Question Id : 3330086311 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If initial conditions for a system are inherently zero, what does it physically mean?

Options :

1. ✘ The system is at rest but stores energy
2. ✘ The system is working but does not store energy
3. ✔ The system is at rest or no energy is stored in any of its part
4. ✘ The system is working with zero reference input

Question Number : 72 Question Id : 3330086312 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the system is stable, the response is smooth and non-oscillatory (damping coefficient, $\xi > 1$), the response is referred to as

Options :

1. ✔ Overdamped
2. ✘ Critically damped
3. ✘ Underdamped
4. ✘ Undamped

Question Number : 73 Question Id : 3330086313 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✘ Frequency response
2. ✘ Transient response
3. ✔ Servo problem
4. ✘ Regulatory problem

Question Number : 74 Question Id : 3330086314 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following controllers has more oscillatory behaviour in response?

Options :

1. ✘ P-controller
2. ✔ PI- controller
3. ✘ PD- controller
4. ✘ PID -controller

Question Number : 75 Question Id : 3330086315 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A servo control loop responds for

Options :

1. ✘ Load changing
2. ✔ Set point changing
3. ✘ Both load and set point changing
4. ✘ Neither load nor set point changing

Question Number : 76 Question Id : 3330086316 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Second-order system of under-damped case, the decay ratio and overshoot are related as

Options :

1. ✘ $\text{Overshoot} = (\text{decay ratio})^2$
2. ✔ $\text{Overshoot} = \sqrt{\text{Decay ratio}}$
3. ✘ $\text{Decay ratio} = \text{Overshoot}$
4. ✘ $\text{Decay ratio} = (\text{Overshoot})^3$

Question Number : 77 Question Id : 3330086317 Display Question Number : Yes

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Bode diagram is generated from output response of the system subjected to _____ input

Options :

1. ✘ Impulse
2. ✘ Step
3. ✘ Ramp
4. ✔ Sinusoidal

Question Number : 78 Question Id : 3330086318 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Routh test

Options :

1. ✘ Criterion provides information about the actual location of roots
2. ✔ Cannot be used to test the stability of a control system containing transportation lag
3. ✘ Criterion is not applicable to systems with polynomial characteristic equation
4. ✘ Cannot determine as to how many roots of the characteristics equation have positive real roots

Question Number : 79 Question Id : 3330086319 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Main function of baffles on the shell side of a heat exchanger is to

Options :

1. ✘ Decrease the pressure drop
2. ✘ Reduce the scale deposit
3. ✔ Hold the tubes in position
4. ✘ Create turbulence

Question Number : 80 Question Id : 3330086320 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In which of the following type of heat exchanger the heat exchange between the two fluids occur by their complete physical mixing?

Options :

1. ✔ Direct contact heat exchanger
2. ✘ Indirect contact heat exchanger
3. ✘ Recuperator
4. ✘ Regenerator

Question Number : 81 Question Id : 3330086321 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a multistage compressor, intercooling is done to

Options :

1. ✘ Cool the air during compression
2. ✘ Cool the air at delivery
3. ✘ Enable compression in two stages
4. ✔ Minimise the work of compression

Question Number : 82 Question Id : 3330086322 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A specific advantage of using steam as a heating medium in exchangers is its

Options :

1. ✘ Inexpensiveness
2. ✔ High value of latent heat
3. ✘ High film coefficient
4. ✘ Non-corrosive condensate

Question Number : 83 Question Id : 3330086323 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The number of bubble caps to be used per tray is determined from

Options :

1. ✘ The vapour load
2. ✘ The liquid load
3. ✘ Tray diameter
4. ✔ Allowable gas velocity

Question Number : 84 Question Id : 3330086324 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the tray distillation column, flooding determines

Options :

1. ✘ Maximum vapor flow allowed
2. ✔ Maximum pressure allowed
3. ✘ Minimum vapor flow
- 4.

✘ Minimum pressure allowed

Question Number : 85 Question Id : 3330086325 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Liquid remaining in unit volume of bed after bed is drained is called as

Options :

1. ✘ Final holdup
2. ✘ Total holdup
3. ✓ Static holdup
4. ✘ Dynamic holdup

Question Number : 86 Question Id : 3330086326 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is the suitable contacting equipment for gas-liquid operations involving liquids with dispersed solid?

Options :

1. ✘ Packed columns
2. ✘ Bubble columns
3. ✓ Plate columns

4. ✘ Spray columns

Question Number : 87 Question Id : 3330086327 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If an amount R is paid at the end of every year for ' n ' years, then the net present value of the annuity at an interest rate of ' i ' is

Options :

1. ✘ $R[\{(1 + i)^n - 1\}/i]$

2. ✔ $R[\{(1 + i)^n - 1\}/i(1 + i)^n]$

3. ✘ $R(1 + i)^n$

4. ✘ $R/(1 + i)^n$

Question Number : 88 Question Id : 3330086328 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a component of working capital investment?

Options :

1. ✘ Utilities plants

2. ✓ Maintenance and repair inventory

3. ✗ Process equipment

4. ✗ Depreciation

Question Number : 89 Question Id : 3330086329 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Operating profit of a chemical plant is equal to

Options :

1. ✓ Profit before interest and tax

2. ✗ Profit after tax plus depreciation

3. ✗ Net profit and tax

4. ✗ Profit after tax

Question Number : 90 Question Id : 3330086330 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following methods of depreciation calculations results in book values greater than those obtained with straight line method?

Options :

1. ✘ Multiple straight-line method
2. ✔ Sinking fund method
3. ✘ Declining balance method
4. ✘ Sum of the years digit method

Question Number : 91 Question Id : 3330086331 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Thermal diffusivity of a material (α) is defined as

Options :

1. ✔ $\alpha = \frac{k}{\rho C_p}$

2. ✘ $\alpha = \frac{k}{C_p}$

3. ✘ $\alpha = \frac{k C_p}{\rho}$

4. ✘ $\alpha = \frac{k}{\rho}$

Question Number : 92 Question Id : 3330086332 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The catalyst used in the low-pressure Ziegler process for polyethylene manufacture _____

Options :

1. ✘ Is Nickel
2. ✔ Consists of aluminium triethyl combined with titanium tetrachloride
3. ✘ Consists of aluminium chloride combine with titanium dioxide
4. ✘ Is vanadium pentoxide

Question Number : 93 Question Id : 3330086333 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The major chemical recovered from the black liquor in Kraft Pulp Process is

Options :

1. ✘ Sodium sulphate
2. ✔ Sodium carbonate
3. ✘ Sodium hydroxide
4. ✘ Sodium bicarbonate

Question Number : 94 Question Id : 3330086334 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Each term of the Bernoulli's equation written in the form $\frac{p}{\rho} + \frac{g}{g_c}(Z) + \frac{v^2}{2g_c} = \text{Constant}$, represents the total energy per unit

Options :

1. ✓ Mass
2. ✗ Volume
3. ✗ Specific weight
4. ✗ Specific volume

Question Number : 95 Question Id : 3330086335 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the disadvantage of Solvay process?

Options :

1. ✓ Higher salt consumption
2. ✗ No co-products to dispose
3. ✗ Use of low-grade brine

4. ✘ Less electric power

Question Number : 96 Question Id : 3330086336 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is undesirable in urea production?

Options :

1. ✘ Ammonium carbamate formation
2. ✔ Biuret formation
3. ✘ Dehydration of ammonium carbamate
4. ✘ Liquid NH_3

Question Number : 97 Question Id : 3330086337 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Washing soda is

Options :

1. ✘ Na_2CO_3
2. ✘ $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$
3. ✔ $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$

4. ✘ NaHCO_3

Question Number : 98 Question Id : 3330086338 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Tetrafluoroethylene is known as

Options :

1. ✘ Perspex

2. ✘ Nylon-66

3. ✘ Polyester

4. ✔ Teflon

Question Number : 99 Question Id : 3330086339 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Oils and fats are

Options :

1. ✘ Higher alcohols

2. ✔ Esters of higher acids

3. ✘ Alkaloids

4. ✘ Carbohydrates

Question Number : 100 Question Id : 3330086340 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The monometallic catalyst used in the catalytic reforming of naphtha is

Options :

1. ✔ Platinum

2. ✘ Nickel

3. ✘ Molybdenum

4. ✘ Cobalt

Question Number : 101 Question Id : 3330086341 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What happens in a reversible adiabatic expansion process?

Options :

1. ✘ Heating takes place

2. ✔ Cooling takes place

3. ✘ Pressure remains constant

4. ✘ Temperature remains constant

Question Number : 102 Question Id : 3330086342 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Economy of a multiple effect evaporator is not influenced much by the

Options :

1. ✔ Boiling point elevations

2. ✘ Temperature of the feed

3. ✘ Rate of heat transfer

4. ✘ Ratio of the weight of thin liquor to thick liquor

Question Number : 103 Question Id : 3330086343 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The terminal velocity of a small sphere settling in a viscous fluid varies as the

Options :

1. ✘ First power of its diameter

2. ✘ Inverse square of its diameter

3. ✓ Inverse of the fluid viscosity

4. ✘ Square of the difference in specific weights of solid and fluid

Question Number : 104 Question Id : 3330086344 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Water hammer is caused in steam carrying pipelines, because of

Options :

1. ✓ Partial condensation of steam

2. ✘ Vibration of pipeline

3. ✘ High degree of super heat of steam

4. ✘ Its exposure to torrential rain

Question Number : 105 Question Id : 3330086345 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Floating head heat exchangers are used for the

Options :

1. ✘ Heat transfer between corrosive fluids

2. ✓ Cases where temperature difference between the shell and the tubes is more ($>50^{\circ}\text{C}$)

3. ✘ Co-current heat transfer systems

4. ✘ Counter-current heat transfer systems

Question Number : 106 Question Id : 3330086346 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Rate of a chemical reaction is not influenced by the

Options :

1. ✘ Catalyst

2. ✘ Temperature

3. ✘ Reactants concentration

4. ✔ Number of molecules of reactants taking part in a reaction

Question Number : 107 Question Id : 3330086347 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 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 : 108 Question Id : 3330086348 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The hydrodynamic and thermal boundary layers will merge when

Options :

1. ✔ Prandtl number is one
2. ✘ Schmidt number tends to infinity
3. ✘ Nusselt number tends to infinity
4. ✘ Archimedes number is greater than 10,000

Question Number : 109 Question Id : 3330086349 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Find x, y, z and w given that $3 \begin{bmatrix} x & y \\ z & w \end{bmatrix} = \begin{bmatrix} x & 5 \\ -1 & 2w \end{bmatrix} + \begin{bmatrix} 6 & x+y \\ z+w & 5 \end{bmatrix}$

Options :

1. ✘ $x = 3, \quad y = 4, \quad z = 3, \quad w = 5$

2. ✘ $x = 3, \quad y = 4, \quad z = 5, \quad w = 2$

3. ✘ $x = 2, \quad y = 4, \quad z = 2, \quad w = 5$

4. ✔ $x = 3, \quad y = 4, \quad z = 2, \quad w = 5$

Question Number : 110 Question Id : 3330086350 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Find the largest eigenvalue of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$

Options :

1. ✘ 1

2. ✔ 6

3. ✘ 2

4. ✘ 3

Question Number : 111 Question Id : 3330086351 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\lim_{x \rightarrow 0} (x - \sin x) \left(\frac{1}{x} \right) =$$

Options :

1. ✓ 0

2. ✗ 1

3. ✗ 2

4. ✗ 3

Question Number : 112 Question Id : 3330086352 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The mean of a binomial distribution is 5, then its variance is

Options :

> 5

1. ✗

5

2. ✗

< 5

3. ✓

25

4. ✗

Question Number : 113 Question Id : 3330086353 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

General solution of $(D^2 - 5D + 6)y = 0$ is $y(x) = \underline{\hspace{2cm}}$

Options :

$$c_1 e^{-3x} + c_2 e^{2x}$$

1. ✖

$$c_1 e^{3x} + c_2 e^{-2x}$$

2. ✖

$$c_1 e^{3x} + c_2 e^{2x}$$

3. ✔

$$c_1 e^{-3x} + c_2 e^{-2x}$$

4. ✖

Question Number : 114 Question Id : 3330086354 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Integrating factor of the Linear Differential Equation $\frac{dy}{dx} + \frac{2y}{x} = x \log x$ is

Options :

1. ✖ X

2.

✓ x^2

3. ✗ x^3

4. ✗ x^4

Question Number : 115 Question Id : 3330086355 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the Taylor series expansion of e^x about $x = 2$, the coefficient of $(x - 2)^4$ is

Options :

1. ✗ $\frac{1}{4!}$

2. ✗ $\frac{2^4}{4!}$

3. ✓ $\frac{e^2}{4!}$

4. ✗ $\frac{e^4}{4!}$

Question Number : 116 Question Id : 3330086356 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Laurent series of $f(z) = \frac{z}{(z^2+1)(z^2+4)}$, $|z| < 1$

Options :

1. ✓ $\frac{1}{4}z - \frac{5}{16}z^3 + \frac{21}{64}z^5 + \dots$

2. ✗ $\frac{1}{2} - \frac{1}{4}z^2 + \frac{5}{16}z^4 + \frac{21}{64}z^6 + \dots$

3. ✗ $\frac{1}{2}z - \frac{3}{4}z^3 + \frac{15}{8}z^5 + \dots$

4. ✗ $\frac{1}{2} + \frac{1}{2}z^2 + \frac{3}{4}z^4 + \frac{15}{8}z^6 + \dots$

Question Number : 117 Question Id : 3330086357 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let E and F be the events of a sample space S of an experiment, if $P\left(\frac{S}{F}\right) = P\left(\frac{F}{F}\right)$, then $P(S/F)$ is equal to

Options :

1. ✗ 0

2.

✘ -1

3. ✔ 1

4. ✘ 2

Question Number : 118 Question Id : 3330086358 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $p = \frac{1}{8}$; $n = 640$; $q = \frac{7}{8}$; then variance Binomial Distribution

Options :

1. ✘ 0.07

2. ✘ 0.7

3. ✘ 7.0

4. ✔ 70.0

Question Number : 119 Question Id : 3330086359 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The function $f(x,y) = x^2 + y^2 - xy - x - y + 5$ has

Options :

1. ✘ Maximum at (1,1)

2. ✘ Saddle point at (1,1)

3. ✔ Minimum at (1,1)

4. ✘ Minimum at (1,2)

Question Number : 120 Question Id : 3330086360 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

From the given data value of $\int_1^{2.1} \frac{1}{x} dx$ using Simpson's 1/3rd rule is _____

| | | | | | |
|------|---|------|------|------|-----|
| x | 1 | 1.25 | 1.5 | 1.75 | 2.0 |
| f(x) | 1 | 1.25 | 1.75 | 1.5 | 0.5 |

Options :

1. ✘ 0.06932

2. ✔ 0.6932

3. ✘ 6.932

4. ✘ 0.006932