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2023



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1.Options shown in green color and with ✔ icon are correct.

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Question Paper Name :	Chemical Engineering 30th May 2023 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
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Examiner permission :	Cant View
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Chemical Engineering

Section Id :	78773228
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 : 7877323241 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

100 Kg of a saturated solution of a salt is heated from 35°C to 80°C. What is the maximum amount of salt that can be further dissolved? Solubility of salt are 4.8 and 7.2 (mol/Kg solvent) at 35°C and 80°C, respectively. Molecular weights of salt and solvent are 50 and 30.

Options :

1. ✔ 9.68 Kg

2. ✖ 16.65 Kg

3. ✖ 13.59 Kg

4. ✖ 29.03 Kg

Question Number : 2 Question Id : 7877323242 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A cube will have a sphericity of

Options :

1. ✖ $(2\pi/3)^{0.33}$

2. ✖ $(\pi/6)^{0.66}$

3. ✖ $(\pi/3)^{0.33}$

4. ✔ $(\pi/6)^{0.33}$

Question Number : 3 Question Id : 7877323243 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In equimolar counter diffusion of gases, total pressure on either side of the diffusion path are 100 and 30 Kpa. If the length of the diffusional path is 75 cm, what is the total pressure, 45 cm from the high pressure end?

Options :

1. ✔ 58 kPa

2. ✖ 65 kPa

3. ✖ 60 kPa

4. ✖ 72 kPa

Question Number : 4 Question Id : 7877323244 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 inertial forces to gravitational forces is better known as

Options :

1. ✖ Reynolds number

2. ✖ Weber number

3. ✖ Euler number

4. ✔ Froude number

Question Number : 5 Question Id : 7877323245 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A body falls freely for distance S from rest. Its velocity v is

Options :

1. ✔ $K\,(Sg)^{0.5}$

2. ✖ $K\,(Sg)$

3. ✖ $K\,(Sg)^{2}$

4. ✖ $K\,(Sg)^{1.5}$

Question Number : 6 Question Id : 7877323246 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An engine is operating at an efficiency of 0.29, which is 75 % of the efficiency of an ideal heat engine. If the ideal heat engine receives heat at 225°C, at what temperature, heat is rejected by the ideal engine?

Options :

1. ✖ 138 °C

2. ✔ 32 °C

3. ✖ 144 °C

4. ✖ 116 °C

Question Number : 7 Question Id : 7877323247 Display Question Number : Yes Is Question

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

The pressure difference between inside and outside of a liquid drop is

Options :

1. ✖ $16\sigma /d$

2. ✖ $8\sigma /d$

3. ✔ $4\sigma /d$

4. ✖ $2\sigma /d$

Question Number : 8 Question Id : 7877323248 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Weight of liquid that rises in a capillary tube is supported by

Options :

1. ✖ horizontal component of surface tension

2. ✖ the Drag force

3. ✔ vertical component of surface tension

4. ✖ the viscous force

Question Number : 9 Question Id : 7877323249 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The continuity equation is a mathematical statement of

Options :

1. ✖ law of conservation of energy

2. ✔ law of conservation of mass

3. ✖ law of conservation of momentum

4. ✖ law of conservation of mass and energy

Question Number : 10 Question Id : 7877323250 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Condensate film builds up from top to bottom in film condensation of liquid along a vertical tube. Local heat transfer coefficient

Options :

1. ✖ first decreases and then increases

2. ✖ remains constant

3. ✖ increases from top to bottom

4. ✔ decreases from top to bottom

Question Number : 11 Question Id : 7877323251 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A stagnation point is where

Options :

1. ✖ the pressure is zero

2. ✔ the flow velocity is zero

3. ✖ the total energy is zero

4. ✖ the flow resistance is the maximum

Question Number : 12 Question Id : 7877323252 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Given $dx/dt = \sin(A)$ for $x(0) = 0$, the value of x at $t = 60^{o}$ is

Options :

1. ✖ 0.36

2. ✖ 0.0

3. ✔ 0.5

4. ✖ 1.0

Question Number : 13 Question Id : 7877323253 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Pure R at a concentration of 4 kmol/m^3 is fed at a flow rate of 0.02 m^3/s, to an adiabatic plug flow reactor at a temperature of 600 K. The reaction, R → S is 35 % complete. Find the exit temperature, if heat of reaction is 75000 kJ/kmol and heat capacities of both R and S are equal to 110 kJ/kmol-K.

Options :

1. ✖ 238 K

2. ✖ 438 K

3. ✖ 938 K

4. ✔ 838 K

Question Number : 14 Question Id : 7877323254 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A dimensionless number used to modify capital cost required to erect a chemical plant from a past date to a later time, is known as

Options :

1. ✔ Cost Index

2. ✖ Scale up factor

3. ✖ Six-tenth factor

4. ✖ Inflation index

Question Number : 15 Question Id : 7877323255 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 point velocity to the maximum velocity in laminar flow through a pipe is

Options :

1. ✔ $1 - (r/R)^2$

2. ✖ $1 - (r/R)$

3. ✖ $(r/R)^2$

4. ✖ (r/R)

Question Number : 16 Question Id : 7877323256 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

100 kmol of an equimolar mixture of A and B is subjected to flash distillation to yield a vapor product containing 80 mole percent A. If the relative volatility of the system is 6, how many moles of liquid remain in the still?

Options :

1. ✖ 90

2. ✖ 55

3. ✖ 80

4. ✔ 75

Question Number : 17 Question Id : 7877323257 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For compressing and moving gases, the pressure difference produced is the maximum for

Options :

1. ✖ Fans

2. ✖ Vacuum Pumps

3. ✖ Blowers

4. ✔ Compressors

Question Number : 18 Question Id : 7877323258 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a particular temperature range, slope of temperature versus vapor pressure plot is 0.08 atm/K. Given the boiling point of the liquid at 330 K is 2 atm., what is the normal boiling point of the liquid?

Options :

1. ✖ 342.5 K

2. ✖ 292.5 K

3. ✖ 165 .0 K

4. ✔ 317.5 K

Question Number : 19 Question Id : 7877323259 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A foot valve is a

Options :

1. ✔ direction control valve

2. ✖ relief valve

3. ✖ pressure reducing valve

4. ✖ back pressure valve

Question Number : 20 Question Id : 7877323260 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

66 kg of C_3H_8 are burnt in 1522.5 kg of air to yield carbon dioxide and water. Find the percentage excess of air used for the combustion

Options :

1. ✖ 31

2. ✔ 47

3. ✖ 33

4. ✖ 49

Question Number : 21 Question Id : 7877323261 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The equivalent diameter of a 6 cm x 12 cm conduit is,

Options :

1. ✖ 2 cm

2. ✔ 8 cm

3. ✖ 72 cm

4. ✖ 6 cm

Question Number : 22 Question Id : 7877323262 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a cylindrical particle, whose L/D is one, the sphericity is

Options :

1. ✖ $2^{1/2}$

2. ✔ 1

3. ✖ <1

4. ✖ 2

Question Number : 23 Question Id : 7877323263 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If air at 35 ^{o}C and 100 kPa pressure has percentage humidity of 65 %, find its molal humidity and relative humidity? Equilibrium vapor pressure of water at 35^{o}C is 8.8 kpA

Options :

1. ✗ 0.039, 40

2. ✗ 0.039, 67

3. ✗ 0.063, 71

4. ✓ 0.063, 67

Question Number : 24 Question Id : 7877323264 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The specific surface of spherical particles – diameter relation is

Options :

1. ✗ proportional to diameter^2

2. ✗ directly proportional

3. ✓ inversely proportional

4. ✗ proportional to equivalent diameter^2

Question Number : 25 Question Id : 7877323265 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The crushing efficiency of a machine will be about

Options :

1. ✖ 20 %

2. ✖ 80 %

3. ✖ 10 %

4. ✔ 2 %

Question Number : 26 Question Id : 7877323266 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a second order system of transfer function $2/(2s^2 +3s +4)$, response to a unit step function will be

Options :

1. ✖ low settling time

2. ✖ unstable

3. ✖ sluggish

4. ✔ oscillatory

Question Number : 27 Question Id : 7877323267 Display Question Number : Yes Is Question

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

The mechanism of size reduction in Ultra fine grinders is primarily

Options :

1. ✖ cutting

2. ✔ attrition

3. ✖ impact

4. ✖ compression

Question Number : 28 Question Id : 7877323268 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the half-life of a reaction is half the full lifetime of the reaction, the reaction will be

Options :

1. ✖ second order

2. ✖ first order

3. ✖ half order

4. ✔ zero order

Question Number : 29 Question Id : 7877323269 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A filter aid in the slurry will

Options :

1. ✔ increases the cake porosity

2. ✖ decreases cake porosity

3. ✖ increase cake compressibility

4. ✖ decreases cake compressibility

Question Number : 30 Question Id : 7877323270 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Increase in the weir height of a plate in a sieve plate column could lead to

Options :

1. ✖ Entrainment

2. ✖ Weeping

3. ✔ Flooding

4. ✖ Foaming

Question Number : 31 Question Id : 7877323271 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The dimensions of filter medium resistance are

Options :

1. ✖ ML^{-1}

2. ✖ L^{-1}

3. ✔ $M^{-1}L$

4. ✖ $M^{-1}L^{-1}$

Question Number : 32 Question Id : 7877323272 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 75 mm diameter metallic ball is allowed to cool from 125°C through contact with air at 25°C. Temperature drop is noted as 4°C per minute. Assume uniform temperature with in the ball. Value of heat transfer coefficient in W/m^2-C

Options :

1. ✖ 2.034

2. ✖

202.2

3. ✖ 81.4

4. ✔ 20.25

Question Number : 33 Question Id : 7877323273 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Net positive suction head (NPSH) of a centrifugal pump is defined as

Options :

1. ✖ velocity head + pressure head, at suction

2. ✖ velocity head + pressure head, at discharge

3. ✔ velocity head + pressure head, at suction - vapor pressure of liquid

4. ✖ velocity head + pressure head, at discharge - vapor pressure of liquid

Question Number : 34 Question Id : 7877323274 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A first order system, which is initially at 50, is subjected to a 25 unit magnitude step change. After 60 seconds, system response showed a change of 15. What would be the time constant of the system

Options :

1. ✔ 65 seconds

2. ✖ 75 seconds

3. ✖ 80 seconds

4. ✖ 110 seconds

Question Number : 35 Question Id : 7877323275 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Increase in temperature improved the rate of gas-liquid mass transfer. This could be due to

Options :

1. ✖ decrease in interfacial resistance

2. ✖ decrease in both the resistances

3. ✖ decrease in gas phase resistance

4. ✔ decrease in liquid phase resistance

Question Number : 36 Question Id : 7877323276 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a rotary drum filter, the controlling resistance is

Options :

1. ✔ the cake resistance

2. ✖ the filter medium resistance

3. ✖ the piping resistance

4. ✖ all of the above

Question Number : 37 Question Id : 7877323277 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Differential settling methods depend on

Options :

1. ✖ Difference in densities

2. ✔ Difference in terminal velocities

3. ✖ Difference in particle sizes

4. ✖ Difference in liquid-solid density

Question Number : 38 Question Id : 7877323278 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Temperature and pressure levels recommended for $SO_2 + ½\ O_2 \rightarrow SO_3$

Options :

1. ✖ Low temperature, low pressure

2. ✔ Low temperature, high pressure

3. ✖ High temperature, high pressure

4. ✖ High temperature, low pressure

Question Number : 39 Question Id : 7877323279 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider steady state molecular diffusion from the surface of a sphere into a stagnant fluid. If the flux at a distance, d from the center of the sphere is N, what is the flux at a distance 3d from the center of sphere

Options :

1. ✖ 3N

2. ✖ N

3. ✖ 9N

4. ✔ N/3

Question Number : 40 Question Id : 7877323280 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one among the following is thermoplastic

Options :

1. ✔ Polyethylene

2. ✖ Silicone

3. ✖ Bakelite

4. ✖ Polyester

Question Number : 41 Question Id : 7877323281 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Teflon is a polymeric product of

Options :

1. ✖ CF_4

2. ✖ $CH_2 = CHF$

3. ✖ C_2F_2

4. ✔ C_2F_4

Question Number : 42 Question Id : 7877323282 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Pasteurization of milk involves

Options :

1. ✖ Heating to boiling

2. ✖ Cooling followed by moderate heating

3. ✖ Cooling to 0^oC

4. ✔ Moderate heating followed by cooling

Question Number : 43 Question Id : 7877323283 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 will improve the equilibrium conversion of the following gas phase reaction, $2A + B = R + 2S$

Options :

1. ✗ increase in temperature

2. ✗ increase in pressure

3. ✓ presence of inerts in the feed

4. ✗ use of a catalyst

Question Number : 44 Question Id : 7877323284 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A synthetic detergent constituent, that prevents re-deposition of dirt on the fabric, is

Options :

1. ✓ Sodium carboxy methyl cellulose

2. ✗ Sodium silicate

3. ✗ Sodium tripolyphosphate

4. ✗ Sodium sulfate

Question Number : 45 Question Id : 7877323285 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

The anodic reaction in the electrolysis of brine solution is

Options :

1. ✔ Oxidation of chlorine ions

2. ✖ Reduction of sodium ions

3. ✖ Oxidation of sodium ions

4. ✖ Reduction of chlorine ions

Question Number : 46 Question Id : 7877323286 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The major constituents of coke oven gas are

Options :

1. ✖ CH_4, CO_2 and H_2O

2. ✔ CH_4, CO and H_2

3. ✖ CH_4, CO and N_2

4. ✖ CO_2, CO and H_2

Question Number : 47 Question Id : 7877323287 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A first order liquid phase reaction, A→B, is carried out at constant temperature in a plug flow reactor of 5 L volume. Inlet volumetric flow rate and inlet concentration of A is 1 L/min and 2 mol/L, respectively. Considering a 75 % conversion, find the rate constant in min^{-1}

Options :

1. ✖ 0.42

2. ✖ 0.72

3. ✔ 0.28

4. ✖ 0.66

Question Number : 48 Question Id : 7877323288 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In gas absorption, if the gas phase and liquid phase transfer coefficients are nearly equal and the equilibrium curve is nearly flat, then the controlling resistance lies in

Options :

1. ✖ the liquid phase

2. ✔ the gas phase

3. ✖ equally in gas and liquid phases

4. ✖ at the interface

Question Number : 49 Question Id : 7877323289 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A sphere, a cube and a thin circular plate, all made of the same material and having the same mass, are available at a temperature of 250^0C. When they are exposed to the ambient air, which object will provide the lowest heat transfer rate?

Options :

1. ✖ circular plate

2. ✖ cube

3. ✔ sphere

4. ✖ all will cool at the same rate

Question Number : 50 Question Id : 7877323290 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider two black bodies, P and Q. Area of Q is 6 times the area of P. 60 % of energy emitted by P is received by Q. Percentage of energy emitted by Q that is received by P is

Options :

1. ✖ 60

2. ✔ 10

3. ✖ 40

4. ✖ 36

Question Number : 51 Question Id : 7877323291 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum heat loss from a pipe occurs when the radius of insulation equals

Options :

1. ✔ the ratio of thermal conductivity to heat transfer coefficient

2. ✖ the ratio of heat transfer coefficient to thermal conductivity

3. ✖ the radius of the pipe

4. ✖ the product of thermal conductivity and heat transfer coefficient

Question Number : 52 Question Id : 7877323292 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 Buoyant forces to viscous forces is better known as

Options :

1. ✖ Prandtl number

2. ✖ Rayleigh number

3. ✖ Stanton number

4. ✔ Grashof number

Question Number : 53 Question Id : 7877323293 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For an existing plate distillation column, reflux condition is changed from saturated liquid to unsaturated liquid (cold reflux). Its impact will be

Options :

1. ✔ Product purity improves

2. ✖ Mass flow rate of distillate increases

3. ✖ Side stream withdrawal will become easy

4. ✖ More feed can be processed

Question Number : 54 Question Id : 7877323294 Display Question Number : Yes Is Question

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

When the Prandtl number is greater than unity, the thermal boundary layer

Options :

1. ✖ and hydrodynamic boundary layer are identical

2. ✖ is thicker than the hydrodynamic boundary layer

3. ✔ is thinner than the hydrodynamic boundary layer

4. ✖ disappears

Question Number : 55 Question Id : 7877323295 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The distribution of shear stress in a stream of fluid in a circular tube is

Options :

1. ✖ parabolic with radius for both laminar and turbulent flows

2. ✔ linear with radius for both laminar and turbulent flows

3. ✖ parabolic with radius for turbulent flow

4. ✖ linear with radius for laminar flow

Question Number : 56 Question Id : 7877323296 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

15 Kg of pure solvent are used to extract A from a 40 Kg feed containing 25 mass percent A, in a single stage operation. If the A concentration in extract and raffinate streams are 50 and 5 mass percent, what is the mass of the raffinate phase.

Options :

1. ✖ 35.01 Kg

2. ✖ 39.93 Kg

3. ✖ 30.55 Kg

4. ✔ 38.89 Kg

Question Number : 57 Question Id : 7877323297 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The average heat transfer coefficient for drop wise condensation is

Options :

1. ✖ less than that of film wise condensation

2. ✔ greater than that of drop wise condensation

3. ✖

equal to that of film wise condensation

4. ✖ cannot be compared

Question Number : 58 Question Id : 7877323298 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The total emissive power (E) of a gray body at a surface temperature of T is given by

Options :

1. ✔ $E = \varepsilon\sigma T^4$

2. ✖ $E = (1-\varepsilon)\sigma T^4$

3. ✖ $E = (\varepsilon-1)\sigma T^4$

4. ✖ $E = \sigma T^4$

Question Number : 59 Question Id : 7877323299 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For the same process temperatures, the ratio of LMTD in parallel flow to the LMTD in counter flow in liquid-liquid heat exchanger is always

Options :

1. ✔ <1

2. ✖ =1

3. ✖ >1

4. ✖ ∞

Question Number : 60 Question Id : 7877323300 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If some of the tubes in a heat exchanger are sealed, the effective heat transfer area will

Options :

1. ✖ increase

2. ✖ remain same

3. ✔ decrease

4. ✖ doubles

Question Number : 61 Question Id : 7877323301 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a system of transfer function, $2/(3s+2)^3$, crossover frequency is

Options :

1. ✖ 0.58

2. ✖ 1.73

3. ✔ 1.15

4. ✖ zero

Question Number : 62 Question Id : 7877323302 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The thermal efficiency of an ideal Rankine cycle is lower than that of a Carnot cycle operating between the same temperature limits because

Options :

1. ✖ energy rejection does not take place at constant temperature

2. ✖ the turbine is not reversible and adiabatic

3. ✔ energy addition does not take place at constant temperature

4. ✖ the pump is not reversible and adiabatic

Question Number : 63 Question Id : 7877323303 Display Question Number : Yes Is Question

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

A gas contained in a cylinder is compressed reversibly from the initial state (P_1, V_1) to the final state (P_2, V_2) according to the path, PV^n = constant. The work done on the gas

Options :

1. ✖ $n(P_1V_1 - P_2V_2)$

2. ✔ $\frac{P_2V_2 - P_1V_1}{1 - n}$

3. ✖ $\frac{P(V_1 - V_2)}{n}$

4. ✖ $\frac{P(V_1 - V_2)}{1 - n}$

Question Number : 64 Question Id : 7877323304 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When wet steam is throttled to a low pressure, its temperature

Options :

1. ✖ increases

2. ✖ does not change

3. ✖ gets halved

4. ✔ decreases

Question Number : 65 Question Id : 7877323305 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A first order reaction is 50 % complete in a packed bed reactor operated under strong pore diffusion regime. What will be the conversion, if the packings are replaced by packings of double the original size

Options :

1. ✔ 0.293

2. ✖ 0.707

3. ✖ 0.500

4. ✖ 0.250

Question Number : 66 Question Id : 7877323306 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A fixed capital investment for a plant is INR 400 000 and salvage value after 6 years of operation is INR 40 000. In the first year of operation, sales income is INR 200 000 and manufacturing expenses are INR 50 000. Applicable tax is 25 % on taxable income. Assuming an interest rate of 15 % and straight-line depreciation practice, what will be the effective present worth at the end of 1^{st} year?

Options :

1. ✖ INR 289 000

2. ✔ INR 127 500

3. ✖ INR 350 000

4. ✖ INR 297 500

Question Number : 67 Question Id : 7877323307 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Activity coefficient is a partial molar property with respect to

Options :

1. ✖ G^R/RT

2. ✖ $\Delta G/RT$

3. ✔ G^E/RT

4. ✖ G/RT

Question Number : 68 Question Id : 7877323308 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

The angle subtended by a vertical line to the point directly overhead on the line of sight of the sun is called

Options :

1. ✖ latitude angle

2. ✖ declination angle

3. ✖ Incident angle

4. ✔ Zenith angle

Question Number : 69 Question Id : 7877323309 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A system, going from P to Q, absorbs 100 KJ of heat and does 30 KJ of work. In the return direction if the system does 30 KJ of work, what is the heat effect?

Options :

1. ✖ -70 KJ

2. ✖ -100 KJ

3. ✔ -40 KJ

4. ✖ -130 KJ

Question Number : 70 Question Id : 7877323310 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A first order liquid phase reaction will be 50 % complete in a CSTR. If another CSTR with the same volume is added in series, the overall percentage conversion will be

Options :

1. ✖ 100

2. ✔ 75

3. ✖ 62.5

4. ✖ 87.5

Question Number : 71 Question Id : 7877323311 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 mass of CO contained in a container of volume 44.8 m^3 at STP

Options :

1. ✖ 28 Kg

2. ✔ 56 Kg

3. ✖ 14 Kg

4. ✖ 44 Kg

Question Number : 72 Question Id : 7877323312 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Binary Diffusion Coefficient for gases vary with

Options :

1. ✖ temp

2. ✔ $(temp)^{1.5}$

3. ✖ $(temp)^{2}$

4. ✖ $(temp)^{-1}$

Question Number : 73 Question Id : 7877323313 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 will have the dimensions of length/time

Options :

1. ✖ Film thickness

2. ✖ diffusion coefficient

3. ✖ volumetric mass transfer coefficient

4. ✔ mass transfer coefficient

Question Number : 74 Question Id : 7877323314 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Schmidt number is the ratio of

Options :

1. ✖ thermal diffusivity to mass diffusivity

2. ✖ momentum diffusivity to thermal diffusivity

3. ✔ momentum diffusivity to mass diffusivity

4. ✖ mass diffusivity to momentum diffusivity

Question Number : 75 Question Id : 7877323315 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An aqueous phase reversible reaction, R = S is conducted with pure R as the feed. The reaction rate ($kmol/m^3$-hr) is described by $r = 0.5C_R - 0.125C_S$. Estimate the residence time necessary for 60 % conversion of R.

Options :

1. ✔ 144 minutes

2. ✖ 96 minutes

3. ✖ 180 minutes

4. ✖ 120 minutes

Question Number : 76 Question Id : 7877323316 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Gas Permeability (P) is defined as

Options :

1. ✔ P = Volume/ pressure gradient

2. ✖ P = 1/ Diffusivity

3. ✖ P = volume x pressure gradient

4. ✖ P = Diffusivity / Solubility

Question Number : 77 Question Id : 7877323317 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A CSTR with a mean residence time of T is given a pulse tracer input. Find the time, t needed for the exit concentration of the tracer to reach half of its initial value

Options :

1. ✖ $t = 0.693/T$

2. ✖ $t = 0.623\ T$

3. ✔ $t = 0.693\ T$

4. ✖ $t = 0.5\ T$

Question Number : 78 Question Id : 7877323318 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

According to Chilton-Colburn analogy for mass transfer

Options :

1. ✖ $N_{St}\ N_{Sc}^{2/3} = f/8$

2. ✖ $N_{St}\ N_{Sc}^{1/3} = f/2$

3. ✔ $N_{St}\ N_{Sc}^{2/3} = f/2$

4. ✖ $N_{St}\ N_{Sc}^{1/3} = f/8$

Question Number : 79 Question Id : 7877323319 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The temperature at which a gas-vapor mixture gets saturated on cooling at constant pressure and out of contact with water is

Options :

1. ✖ Bubble temperature

2. ✔ Dew temperature

3. ✖ Wet bulb temperature

4. ✖ Saturation Temperature

Question Number : 80 Question Id : 7877323320 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Number of independent variables a binary mixture in vapor–liquid equilibrium will have at azeotropic composition is

Options :

1. ✖ 0

2. ✔ 1

3. ✖ 3

4. ✖ 2

Question Number : 81 Question Id : 7877323321 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the activity coefficient crosses unity as mole fraction of more volatile component in a binary mixture changes, the indication is that

Options :

1. ✔ an azeotrope is formed

2. ✖ the separation is easier

3. ✖ the separation is difficult

4. ✖ the system is ideal

Question Number : 82 Question Id : 7877323322 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Absorption factor is

Options :

1. ✖ Slope of the driving force line/ slope of the operating line

2. ✖ Number of transfer units/ number of theoretical plates

3. ✖ Slope of the equilibrium curve / slope of the operating line

4. ✔ Slope of the operating line / slope of the equilibrium curve

Question Number : 83 Question Id : 7877323323 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Pump A costs INR 4000 and will have a salvage of 390. Pump B costs INR 5000 and its salvage value is 2000. Assume an interest rate of 10 %. What should be the common life of the pumps for both to be equivalent economically?

Options :

1. ✔ 5 years

2. ✖ 3 years

3. ✖ 6 years

4. ✖ 4 years

Question Number : 84 Question Id : 7877323324 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the vapor pressure of water retained by a solid is less than the vapor pressure of pure water, then the water content is known as

Options :

1. ✖ Critical moisture content

2. ✖ Free moisture content

3. ✔ Bound Moisture

4. ✖ Equilibrium Moisture content

Question Number : 85 Question Id : 7877323325 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An analytical expression to determine the minimum number of stages required for a specified separation by fractionation is known as

Options :

1. ✖ Rayleigh equation

2. ✖ Kremser equation

3. ✖ McCabe equation

4. ✔ Fenske equation

Question Number : 86 Question Id : 7877323326 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In flashing, the final pressure is

Options :

1. ✖ the bubble pressure

2. ✖ the dew pressure

3. ✔ between bubble and dew pressures

4. ✖ above dew pressure

Question Number : 87 Question Id : 7877323327 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Liquid A decomposes by an irreversible first order reaction and the half-life of this reaction is 20 min. The time required for 75 % conversion is

Options :

1. ✖ 30 min

2. ✖ 35 min

3. ✔ 40 min

4. ✖ 25 min

Question Number : 88 Question Id : 7877323328 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a chemical reaction, it is observed that the rate increases 4-fold, as the concentration is doubled. What is the order of the reaction?

Options :

1. ✖ 1

2. ✔ 2

3. ✖ 1.5

4. ✖ 4

Question Number : 89 Question Id : 7877323329 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An investment will generate INR 25000 per year at the end of each year for 3 years. With a rate of return of 10 %, find the present worth of the investment

Options :

1. ✖ 68375

2. ✖ 75000

3. ✔ 33275

4. ✖ 62150

Question Number : 90 Question Id : 7877323330 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Higher activation energy of a reaction indicates that the reaction is

Options :

1. ✔ Temperature sensitive

2. ✖ Temperature insensitive

3. ✖ More Complete

4. ✖ Higher temperatures are preferable

Question Number : 91 Question Id : 7877323331 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 forces acting on an aeroplane on cruise is

Options :

1. ✔ 4

2. ✖ 2

3. ✖ 5

4. ✖ 3

Question Number : 92 Question Id : 7877323332 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For an isothermal gas phase reaction, $A \rightarrow 2B + C$, the fractional change in volume of the system between complete and no conversion is

Options :

1. ✖ 3

2. ✖ 1

3. ✖ 4

4. ✔ 2

Question Number : 93 Question Id : 7877323333 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

For identical C_{AO}, F_{AO} and X_A, and for all positive reaction orders, the ratio of volume of a CSTR to that of a plug flow reactor is

Options :

1. ✖ <1

2. ✔ >1

3. ✖ = 1

4. ✖ = reaction order

Question Number : 94 Question Id : 7877323334 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

N plug flow reactors in series, each with a volume of V/N will give the same conversion as a single plug flow reactor of volume V, all else remaining the same. This is valid for

Options :

1. ✖ first order reactions

2. ✖ second order reactions

3. ✔ all reaction orders

4. ✖ Zero order reactions

Question Number : 95 Question Id : 7877323335 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Exit age distribution of fluid leaving a vessel is useful to

Options :

1. ✔ study the flow pattern in the reactor

2. ✖ study the reaction mechanism and progress

3. ✖ study the reaction kinetics

4. ✖ determine the flow rates

Question Number : 96 Question Id : 7877323336 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The action of a catalyst is due to its ability to change the

Options :

1. ✔ Activation Energy

2. ✖ Heat of reaction

3. ✖ Equilibrium constant

4. ✖ Temperature and pressure dependence

Question Number : 97 Question Id : 7877323337 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For large values of the Thiele modulus $(L(k/D)^{1/2})$, in case of solid catalyzed first order reaction, effectiveness factor (ε) is given by

Options :

1. ✖ $\varepsilon = 1$

2. ✖ $1 / L(k/D)$

3. ✔ $\varepsilon = 1 / L(k/D)^{1/2}$

4. ✖ $L(k/D)^{1/2}$

Question Number : 98 Question Id : 7877323338 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is a dynamic characteristic of a measuring instrument

Options :

1. ✖ Reproducibility

2. ✔ Speed of response

3. ✖ Sensitivity

4. ✖ Range and span

Question Number : 99 Question Id : 7877323339 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A reactor produces 80 kmol/h of net product. A purge stream with 95 % of product and 5% of an impurity is continuously removed. If the feed to the reactor contains 1 % impurity, how many moles of purge are removed per hour

Options :

1. ✖ 5 kmol

2. ✖ 15 kmol

3. ✔ 20 kmol

4. ✖ 25 kmol

Question Number : 100 Question Id : 7877323340 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 3- micron size bacterium is moving in water at 1 mm/sec. Kinematic viscosity be taken as 1×10^{-6} m^2/s. What will be the drag coefficient

Options :

1. ✖ 800

2. ✖ 24000

3. ✔ 8000

4. ✖ 2400

Question Number : 101 Question Id : 7877323341 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Indicate which of the following statements is correct

Options :

1. ✖ For a time delay system, phase lag decreases with increasing frequency

2. ✖ For a time delay system, amplitude ratio increases with increasing frequency

3. ✖ For a pure capacity system, the frequency increases continuously

4. ✔ For a pure capacity system, amplitude ratio decreases as frequency increases

Question Number : 102 Question Id : 7877323342 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Bolometer is used in the measurement of

Options :

1. ✖ Pressure

2. ✖ Level

3. ✖ Flow

4. ✔ Temperature

Question Number : 103 Question Id : 7877323343 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A cylindrical vessel needs to be designed to store a highly volatile liquid, under high pressure. Which closure head do you recommend?

Options :

1. ✖ Hemi spherical

2. ✖ Torispherical

3. ✔ Ellipsoidal

4. ✖ Flat end

Question Number : 104 Question Id : 7877323344 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a cylindrical shell subjected to internal pressure, what is the relationship between circumferential and longitudinal stresses

Options :

1. ✔ circumferential stress = 2 x longitudinal stress

2. ✖ circumferential stress = 0.5 x longitudinal stress

3. ✖ circumferential stress = longitudinal stress

4. ✖ Two are unrelated

Question Number : 105 Question Id : 7877323345 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A decrease in proportional band of a controller

Options :

1. ✖ decreases decay ratio

2. ✖ improves the stability of a system

3.

✔ increases decay ratio

4. ✖ decreases offset

Question Number : 106 Question Id : 7877323346 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a stable system, as per Bode stability criterion, the amplitude ratio at a phase angle of (-180^{0})

Options :

1. ✖ shall be greater than unity

2. ✖ shall be equal to zero

3. ✔ shall be less than unity

4. ✖ shall be equal to unity

Question Number : 107 Question Id : 7877323347 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An equal percentage valve is of

Options :

1. ✔

increasing sensitivity type

2. ✖ decreasing sensitivity type

3. ✖ constant sensitivity type

4. ✖ insensitive type

Question Number : 108 Question Id : 7877323348 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Biochemical digestion of an effluent is basically a process of

Options :

1. ✖ Reduction

2. ✖ Hydration

3. ✖ Dehydration

4. ✔ Oxidation

Question Number : 109 Question Id : 7877323349 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A piece of equipment has an initial value of Rs. 25000, a service life of 8 years and finally a salvage value of Rs.1000. What is the annual depreciation cost as per straight line method

Options :

1. ✔ Rs.2400

2. ✖ Rs.2500

3. ✖ Rs.2600

4. ✖ Rs.3000

Question Number : 110 Question Id : 7877323350 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 hydrocarbon series is almost absent in crude petroleum

Options :

1. ✖ Naphthenes

2. ✖ Aromatics

3. ✖ Paraffins

4. ✔ Olefins

Question Number : 111 Question Id : 7877323351 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If sum of two eigen values of 3 X 3 matrix A are equal to the trace of the matrix, then find the value of determinant of A

Options :

1. ✔ 0

2. ✖ 1

3. ✖ 2

4. ✖ 3

Question Number : 112 Question Id : 7877323352 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For what values of a, b the following equations $x + 2y + z = 8$, $2x + y + 3z = 13$, $3x + 4y - az = b$ have an infinite number of solutions.

Options :

1. ✖ $a = -11/3, b = -22$

2. ✖ $a = 11/3, b = -22$

3. ✖ $a = 11/3, b = 22$

4. ✔ $a = -11/3, b = 22$

Question Number : 113 Question Id : 7877323353 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\iint (x^2 + y^2)\, dx\, dy$, where the region over the positive quadrant for which $x + y \leq 1$ is

Options :

1. ✖ $\frac{1}{4}$

2. ✖ $\frac{1}{3}$

3. ✔ $\frac{1}{6}$

4. ✖ $\frac{1}{2}$

Question Number : 114 Question Id : 7877323354 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\bar{r} = x\,\boldsymbol{i} + y\boldsymbol{j} + z\boldsymbol{k}$ then, $\nabla^2\left(\frac{1}{r}\right) =$

Options :

1. ✖ 1

2. ✔ 0

3. ✖ 2

4. ✖ 3

Question Number : 115 Question Id : 7877323355 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\sqrt{1-y^2}\,dx = (Sin^{-1}y - x)\,dy$ is

Options :

1. ✖ $y = Sin^{-1}x - 1 + C\,xe^{Sin^{-1}x}$

2. ✖ $x = ySin^{-1}y - 1 + C\,ye^{Sin^{-1}y}$

3. ✖ $y = Sin^{-1}x - 1 + C\,e^{Sin^{-1}x}$

4. ✔ $x = Sin^{-1}y - 1 + C\,e^{Sin^{-1}y}$

Question Number : 116 Question Id : 7877323356 Display Question Number : Yes Is Question

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

The value of $x^2 \frac{d^2y}{dx^2} - x \frac{dy}{dx} + 2y = 0$ is

Options :

1. ✖ $y = x[C_1 Cos\, x + C_2 Sin\, x]$

2. ✖ $y = x[C_1 Cos\, logx - C_2 Sin\, logx]$

3. ✔ $y = x[C_1 Cos\, logx + C_2 Sin\, logx]$

4. ✖ $y = logx[C_1 Cos\, x + C_2 Sinx]$

Question Number : 117 Question Id : 7877323357 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\oint_C \frac{z-3}{z^2+2z+5} dz$, where $C : |z + 1 - i| = 2$ is

Options :

1. ✔ $\pi(i-2)$

2. ✖ $\pi(i+2)$

3. ✖ $\pi(2-i)$

4. ✖ $\pi(1-i)$

Question Number : 118 Question Id : 7877323358 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $f(z) = \frac{e^z}{z + Sinz}$, then the residue at z = 0 is

Options :

1. ✖ 0

2. ✖ $\frac{1}{3}$

3. ✔ $\frac{1}{2}$

4. ✖ 1

Question Number : 119 Question Id : 7877323359 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Probability of getting a 'head' in a single toss of a biased coin is 0.3. The coin is tossed repeatedly till a 'head' is obtained. If the tosses are independent, then the Probability of getting 'head' for the first time in the fifth toss is

Options :

1. ✖ 1

2. ✔ 0.07203

3. ✖ 1.25

4. ✖ 0.5

Question Number : 120 Question Id : 7877323360 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\frac{dy}{dx} = y - x^2$ and y(0) = 1 then using Picard's method the value of $y^{(1)}(1)$ is

Options :

1. ✔ 1.667

2. ✖ 2.667

3. ✖ 3.667

4. ✖ 0