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.

Question Paper Name :	Metallurgy 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
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No

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

Metallurgy

Section Id :	78773227
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 : 7877323121 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 not considered as Coal?

Options :

1. ✖ Anthracite

2. ✖ Lignite

3. ✔ Cassiterite

4.

✖ Bituminous

Question Number : 2 Question Id : 7877323122 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a mineral processing operation, the concentrate grade and recovery is generally having the following relation

Options :

1. ✖ Directly proportional

2. ✔ Inversely proportional

3. ✖ Equal

4. ✖ Grade is always greater than recovery

Question Number : 3 Question Id : 7877323123 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is not a unit step in mineral processing operation

Options :

1. ✖ Liberation

2. ✔ Transportation

3. ✖ Separation

4. ✖ Sieving

Question Number : 4 Question Id : 7877323124 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An iron ore flotation plant treats 600 tph of iron ore with feed grade 52% to upgrade it to 61% with a concentrate yield of 420 tph. Calculate the recovery (in %) of the process.

Options :

1. ✖ 70

2. ✖ 66.8

3. ✔ 82.1

4. ✖ 76.8

Question Number : 5 Question Id : 7877323125 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 of diameter 1200 mm, 60 mm diameter steel bars are being used for grinding at a speed of 20 rpm. Calculate the critical speed of the ball mill (in rpm).

Options :

1. ✖ 41.85

2. ✖ 11.25

3. ✖ 56.02

4. ✔ 39.62

Question Number : 6 Question Id : 7877323126 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Pine oil is a common example of

Options :

1. ✖ Collector

2. ✖ Activator

3. ✔ Frother

4. ✖ Depressant

Question Number : 7 Question Id : 7877323127 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Coal quality increases in the following order

Options :

1. ✖ Anthracite → Bituminous → Lignite → Peat

2. ✖ Anthracite → Lignite → Bituminous → Peat

3. ✔ Peat → Lignite → Bituminous → Anthracite

4. ✖ Lignite → Bituminous → Peat → Anthracite

Question Number : 8 Question Id : 7877323128 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The process of shutting down the furnace is called as

Options :

1. ✔ Blow down

2. ✖ Hanging

3. ✖ Cold shut

4. ✖ Back drafting

Question Number : 9 Question Id : 7877323129 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Near the Tuyere (inside the race way), the gas atmosphere is

Options :

1. ✖ Reducing

2. ✔ Oxidising

3. ✖ Neutral

4. ✖ First reducing & then oxidizing

Question Number : 10 Question Id : 7877323130 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

High top pressure in blast furnace

Options :

1. ✔ Decreases solution loss reaction

2. ✖ Increases the water shift reaction

3. ✖ First decreases the solution loss reaction and then increases

4. ✖ First increases the water shift reaction and then decreases

Question Number : 11 Question Id : 7877323131 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Sequence of removal of impurities in blast furnace steel making

Options :

1. ✖ Si, Mn, C, P

2. ✔ Si, Mn, P, C

3. ✖ Si, C, P, Mn

4. ✖ Si, C, Mn, P

Question Number : 12 Question Id : 7877323132 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The nozzle used in the lance of LD steel making is

Options :

1. ✖ Convergent

2. ✖ Divergent

3. ✔ Convergent-Divergent

4. ✖ Divergent-Convergent

Question Number : 13 Question Id : 7877323133 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which purpose is not solved by calcium treatment in steel melt?

Options :

1. ✖ Inclusion modification

2. ✖ Deep deoxidation

3. ✖ Deep desulphurisation

4. ✔ Deep dephosphorisation

Question Number : 14 Question Id : 7877323134 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is not a function of electromagnetic stirring in continuous casting

Options :

1. ✖ Promote an equiaxed grain at centre

2. ✖ Reduce slag entrapment

3. ✖ Reduce pin hole on the surface

4. ✔ Reduce mould powder entrapment

Question Number : 15 Question Id : 7877323135 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Killing of liquid steel is essential to control

Options :

1. ✔ Soluble O

2. ✖ Soluble C

3. ✖ Soluble N

4. ✖ Soluble S

Question Number : 16 Question Id : 7877323136 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Thickness of solid shell is related to time (t) of solidification in this way

Options :

1. ✖ t^2

2. ✖ t

3. ✔ $t^{0.5}$

4. ✖ t^3

Question Number : 17 Question Id : 7877323137 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Vacuum Degassing depends upon the

Options :

1. ✔ Sieverts' Law

2. ✖ Roult's Law

3. ✖ Henry Law

4. ✖ Biot's Law

Question Number : 18 Question Id : 7877323138 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Bridging and Wedging Takes Place in

Options :

1. ✔ Scaffolding

2. ✖ Channeling

3. ✖ Blow Down

4. ✖ Sintering

Question Number : 19 Question Id : 7877323139 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Predominance area diagrams can tell about the temperature of

Options :

1. ✖ Calcination

2. ✖ Smelting

3. ✖ Melting

4. ✔ Roasting

Question Number : 20 Question Id : 7877323140 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 refractory can be used in highly reducing environments?

Options :

1. ✔ Carbon Graphite

2. ✖ Silica

3. ✖ Zirconia

4. ✖ Alumina

Question Number : 21 Question Id : 7877323141 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Super refractories have a fusion Temperature (in ^{o}C) of

Options :

1. ✖ < 2000

2. ✔ > 2000

3. ✖ 1500

4. ✖ 1780

Question Number : 22 Question Id : 7877323142 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Zirconia Refractories are used for the glass furnace because of

Options :

1. ✔ Low thermal conductivity

2. ✖ High thermal conductivity

3. ✖ Medium thermal conductivity

4. ✖ Optimal thermal conductivity

Question Number : 23 Question Id : 7877323143 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a dislocation with burger's vector equal to b, the strain energy per unit length is X.

What will be the strain energy with burger's vector is equal to 3b?

Options :

1. ✖ X

2. ✖ 3X

3. ✔ 9X

4. ✖ $\sqrt{3}X$

Question Number : 24 Question Id : 7877323144 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 screw dislocation, the stresses around dislocation are _____

Options :

1. ✖ tensile in nature for right-hand screw dislocation

2. ✖ tensile in nature for left-hand screw dislocation

3. ✖ compressive in nature for right-hand screw dislocation

4. ✔ there are no tensile or compressive normal stresses

Question Number : 25 Question Id : 7877323145 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the surface crack causing fracture in a brittle material is made twice as deep, the fracture strength will

Options :

1. ✔ decrease by a factor of $\sqrt{2}$

2. ✖ decrease by a factor of 2

3. ✖ decrease by a factor of 22

4. ✖ not change

Question Number : 26 Question Id : 7877323146 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The minimum thickness of the material to achieve the condition of plane strain is given by _____

Options :

1. ✖ $B = 2.5\ (KIC/\sigma_o)$

2. ✔ $B = 2.5\ (KIC/\sigma_o)^2$

3. ✖ $B = 2.5\ (KIC/\sigma_o)^{1/2}$

4. ✖ $B = 2.5\ (KIC/\sigma_o)^{-1/2}$

Question Number : 27 Question Id : 7877323147 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 strengthening mechanism is most effective in increasing the creep resistance of the material?

Options :

1. ✖ Precipitation hardening

2. ✖ Strain hardening

3. ✔ Dispersion strengthening

4. ✖ Solid solution strengthening

Question Number : 28 Question Id : 7877323148 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 not a high-temperature application precipitate?

Options :

1. ✖ VC

2. ✖ TiC

3. ✖ $Cr_{23}C_6$

4. ✔ Cu_3Al

Question Number : 29 Question Id : 7877323149 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 phenomena is not associated with dislocation?

Options :

1.

✖ Stacking fault

2. ✖ Lomer-Cottrell barrier

3. ✔ Pourbix curve

4. ✖ Frank-reed source

Question Number : 30 Question Id : 7877323150 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

During a cycling loading of the stress, which of the following value cannot be equal to zero?

Options :

1. ✖ Mean pressure

2. ✖ Minimum stress

3. ✖ Maximum stress

4. ✔ Range of stress

Question Number : 31 Question Id : 7877323151 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

If the stress ratio is given by R, and the amplitude ratio is given by A, the relationship between R and A is given as _____

Options :

1. ✖ $A = R$

2. ✖ $A = 1/R$

3. ✔ $A = (1-R)/(1+R)$

4. ✖ $A = (1+R)/(1-R)$

Question Number : 32 Question Id : 7877323152 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A uniform cylinder of length L is elongated to twice of its original length. Calculate true strain and engineering strain for the cylinder in percentage?

Options :

1. ✔ Engineering strain = 100%, True strain = 69.31%

2. ✖ Engineering strain = 69.31%, True strain = 100%

3. ✖ Engineering strain = 50%, True strain = 50%

4. ✖ Engineering strain = 50%, True strain = 100%

Question Number : 33 Question Id : 7877323153 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 correct?

Options :

1. ✔ Trans granular crack: crack propagates through the grain

2. ✖ Intergranular crack: crack propagates through the grain

3. ✖ Trans granular crack: crack propagates along the grain boundary

4. ✖ Intergranular crack: crack propagates along the surface of the sample

Question Number : 34 Question Id : 7877323154 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Work hardening strengthens an alloy by

Options :

1. ✖ Removing internal defects in the crystal structure

2. ✖ Increasing the dislocation density

3. ✖ Decreasing the grain size of alloy

4. ✔ Increasing the lattice resistance to dislocation motion

Question Number : 35 Question Id : 7877323155 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The material property which is not desired for shock load applications?

Options :

1. ✔ Low toughness

2. ✖ High damping

3. ✖ Low hardness

4. ✖ High toughness

Question Number : 36 Question Id : 7877323156 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A dislocation gliding on a given slip plane moves to another slip plane inclined to the first plane

Options :

1. ✔ It is a screw dislocation undergoing cross-slip.

2. ✖ It is an edge dislocation undergoing cross-slip.

3. ✖ It is a screw dislocation undergoing climb.

4. ✖ It is an edge dislocation undergoing climb.

Question Number : 37 Question Id : 7877323157 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the design of a fan-blade for household application, which mechanical property is least important?

Options :

1. ✖ Elastic modulus of the material

2. ✖ Density of the material

3. ✔ Creep strength of the material

4. ✖ Recyclability of the material

Question Number : 38 Question Id : 7877323158 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ductile to brittle transition temperature in metal is around ___ of melting point (T_m)?

Options :

1. ✔ 0.1

2. ✖ 0.5

3. ✖ 0.9

4. ✖ 0.0001

Question Number : 39 Question Id : 7877323159 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 phenomena is responsible for the formation of sessile dislocation?

Options :

1. ✔ Lomer-Cottrell barriers

2. ✖ Frank read source

3. ✖ Age hardening

4. ✖ Dislocation jog and kink

Question Number : 40 Question Id : 7877323160 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 temperature over which ductile material converts into a brittle material?

Options :

1. ✖ 100°

2. ✖ 10°

3. ✖ 50°

4. ✔ 2°

Question Number : 41 Question Id : 7877323161 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 stress required to move a dislocation when the width of dislocation is equal to the Burger's vector of the dislocation?

Options :

1. ✖ G

2. ✖ G/1027

3. ✔ G/400

4. ✖ G/2

Question Number : 42 Question Id : 7877323162 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The nature of fracture in Charpy test is not determined by _____

Options :

1. ✖ distance hammer travelled after impact

2. ✖ appearance of the fracture surface

3. ✖ the amount of energy absorbed

4. ✔ the type of loading

Question Number : 43 Question Id : 7877323163 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 material has highest tendency for ductile to brittle transition?

Options :

1. ✖ FCC

2. ✔ BCC

3. ✖ HCP

4. ✖ DBTT does depends on crystal structure

Question Number : 44 Question Id : 7877323164 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The creep becomes significant above _____ of the homologous temperature.

Options :

1. ✖ 0.2

2. ✖ 0.1

3. ✔ 0.5

4. ✖ 0.9

Question Number : 45 Question Id : 7877323165 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which state of the creep curve state is associated with the metallurgical changes in the material?

Options :

1. ✖ Primary

2. ✖ Secondary

3. ✔ Tertiary

4. ✖ No stage

Question Number : 46 Question Id : 7877323166 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The BCC and HCP metals undergo plastic deformation by the phenomenon of

Options :

1. ✖ Slip

2. ✔ Twinning in combination with slip

3. ✖ Twinning

4. ✖ Edge dislocation

Question Number : 47 Question Id : 7877323167 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The entropy of all elements at 300 K is

Options :

1. ✖ Infinite

2. ✖ Zero

3. ✖ Less than Zero

4. ✔ Greater than Zero

Question Number : 48 Question Id : 7877323168 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A chemical reaction will never be feasible if:

Options :

1. ✖ ΔH is positive and ΔS is positive

2. ✖ ΔH is negative and ΔS is positive

3. ✖ ΔH is negative and ΔS is negative

4. ✔ ΔH is positive and ΔS is negative

Question Number : 49 Question Id : 7877323169 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

"Enthalpy change for a reaction is independent of the number of ways a product can be obtained, if the initial and final conditions are the same," This is stated by

Options :

1. ✖ Second law of thermodynamics

2. ✔ Hess Law

3. ✖ Kirchhoff's Law

4. ✖ Third law of thermodynamics

Question Number : 50 Question Id : 7877323170 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The following relation is true for entropy

Options :

1. ✖ Gas < Liquid < Solid

2. ✔ Solid < Liquid < Gas

3. ✖ Solid < Gas < Liquid

4. ✖ Liquid < Solid < Gas

Question Number : 51 Question Id : 7877323171 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If 'a' is initial molar concentration of the substance and (a - x) is the molar concentration after time t. Then the rate constant for 2nd order reaction is proportional to:

Options :

1. ✔ $\frac{x}{a(a-x)}$

2. ✖ $\ln(\frac{x}{a(a-x)})$

3. ✖ $\frac{a}{x(a-x)}$

4. ✖ $\ln(\frac{a}{x(a-x)})$

Question Number : 52 Question Id : 7877323172 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The efficiency of the heat engine if the temperature decreases from 900°C to 300°C after the work done:

Options :

1. ✖ 66%

2.

✖ 33%

3. ✔ 51%

4. ✖ 49%

Question Number : 53 Question Id : 7877323173 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a spontaneous irreversible process, the total entropy of the system and its surroundings

Options :

1. ✖ is constant

2. ✔ increases

3. ✖ decreases

4. ✖ is zero

Question Number : 54 Question Id : 7877323174 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For non-ideal gases the fugacity approaches the pressure only

Options :

1. ✖ at high temperatures

2. ✖ at high pressure

3. ✔ at low pressure

4. ✖ at low temperature

Question Number : 55 Question Id : 7877323175 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The emissivity of a blackbody is

Options :

1. ✔ 1

2. ✖ 0

3. ✖ 0 to 1

4. ✖ > 1

Question Number : 56 Question Id : 7877323176 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The process of coating Zinc on steel is

Options :

1. ✖ anodizing

2. ✖ passivation

3. ✔ galvanizing

4. ✖ cladding

Question Number : 57 Question Id : 7877323177 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the case of gases, thermal conductivity is predominantly determined by

Options :

1. ✔ Molecular collisions

2. ✖ Lattice vibrations

3. ✖ Moment of free electrons

4. ✖ Bond energy

Question Number : 58 Question Id : 7877323178 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Austenitic stainless steels are corrosion resistant because of

Options :

1. ✖ Austenitic structure

2. ✖ high carbon and high chromium content

3. ✖ high nickel content

4. ✔ low carbon and high chromium content

Question Number : 59 Question Id : 7877323179 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Example for steady-state diffusion

Options :

1. ✔ Hydrogen purification by palladium sheet

2. ✖ Doping semi-conductors

3. ✖ Corrosion resistance of duralumin

4. ✖ Decarburization of steel

Question Number : 60 Question Id : 7877323180 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The fastest diffusing species in Fe is

Options :

1. ✖ Ni

2. ✔ H

3. ✖ Cr

4. ✖ C

Question Number : 61 Question Id : 7877323181 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If Pt and Co are electrically connected, which one gets corroded

Options :

1. ✖ Pt

2. ✔ Co

3. ✖ Both Pt and Co

4. ✖ Cannot decide

Question Number : 62 Question Id : 7877323182 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Diffusion is faster in

Options :

1. ✖ High melting temperature materials

2. ✖ large diffusing atoms

3. ✔ low density materials

4. ✖ covalent bonded materials

Question Number : 63 Question Id : 7877323183 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Laminar flow of a Newtonion fluid ceases to exist, when the Reynolds number exceeds

Options :

1. ✖ 4100

2. ✔ 2100

3. ✖ 1100

4. ✖ 3100

Question Number : 64 Question Id : 7877323184 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 not an ideal characteristic of the passive metal oxide layer?

Options :

1. ✖ Good adherence

2. ✖ High melting point

3. ✖ Low electrical conductivity

4. ✔ High diffusion coefficient

Question Number : 65 Question Id : 7877323185 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Bernoulli's equation is applicable only for

Options :

1. ✖ Irrotational flow

2. ✖ Viscous flow

3. ✔ Incompressible flow

4. ✖ Compressible flow

Question Number : 66 Question Id : 7877323186 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/are the characteristics of a metal oxide if the Pilling and Bed worth ratio is less than 1?

Options :

1. ✖ Protective oxide layer

2. ✔ Unprotective and insufficient oxide

3. ✖ Unprotective oxide

4. ✖ Unprotective and sufficient oxide

Question Number : 67 Question Id : 7877323187 Display Question Number : Yes Is Question

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

A body obeying Kirchoffs law is known as

Options :

1. ✖ black body

2. ✔ grey body

3. ✖ white body

4. ✖ transparent body

Question Number : 68 Question Id : 7877323188 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 inhibitor is used for steel in the water?

Options :

1. ✖ Sodium silicate

2. ✖ Alkali metal nitrates

3. ✔ Benzoic acid

4. ✖ Boron trifluoride

Question Number : 69 Question Id : 7877323189 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Specific conductance is expressed in terms of

Options :

1. ✖ $Ohm\ cm^{-1}$

2. ✔ $Ohm^{-1}\ cm^{-1}$

3. ✖ $Ohm^{-1}\ cm$

4. ✖ $Ohm\ cm$

Question Number : 70 Question Id : 7877323190 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Activation energy of a chemical reaction, homogeneous or heterogeneous, is graphically estimated from a plot (where, k is the rate constant and T is the absolute temperature) between

Options :

1. ✖ k versus T

2. ✖ 1/k versus T

3. ✖ 1/k versus ln T

4. ✔ ln k versus 1/T

Question Number : 71 Question Id : 7877323191 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 types of polymers is least likely to crystallize?

Options :

1. ✖ Syndiotactic polymers

2. ✖ Isotactic polymers

3. ✔ Block copolymers

4. ✖ Alternating copolymers

Question Number : 72 Question Id : 7877323192 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the wrong statement.

Options :

1. ✖ β-brass is an intermediate solid solution

2. ✖ Ordered β-brass is a substitutional solid solution

3. ✔ Disordered β-brass is an interstitial solid solution

4. ✖ The lattice of ordered β-brass is cubic-P

Question Number : 73 Question Id : 7877323193 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 statement is correct?

Options :

1. ✖ Below the critical nucleation rate, rapid nucleation takes place.

2. ✖ Nucleation rate always increases with increase in undercooling.

3. ✖ Barrier to nucleation increases with increase in undercooling.

4. ✔ Undercooling required for homogeneous nucleation is larger than that for heterogeneous nucleation under the similar condition.

Question Number : 74 Question Id : 7877323194 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In precipitation hardening, at 540°C when θ phase ($CuAl_2$) completely dissolves at grain boundaries the single phase α is obtained known as ____

Options :

1. ✖ Saturated solid solution

2. ✔ Homogeneous solid solution

3. ✖ Heterogeneous solid solution

4. ✖ Supersaturated solid solution

Question Number : 75 Question Id : 7877323195 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

During homogeneous solidification of a pure metal from its molten state, very low nucleation rate and very high growth rate will result into the microstructure consisting of

Options :

1. ✔ Very coarse grains

2. ✖ Very fine grains

3. ✖ Mixture of fine and coarse grains

4. ✖ Different for different metal

Question Number : 76 Question Id : 7877323196 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For same critical size of nucleus (r*), which of the following statement is correct for free energy barrier to nucleation and nucleation rate for homogeneous and heterogeneous nucleation? [Assume contact angle $\theta < 180^{\circ}$]

Options :

1. ✖ $(\Delta G^*)_{homo} = (\Delta G^*)_{hetero}$ and $I_{homo} = I_{hetero}$ always

2. ✖ $(\Delta G^*)_{homo} < (\Delta G^*)_{hetero}$ and $I_{homo} > I_{hetero}$

3. ✔ $(\Delta G^*)_{homo} > (\Delta G^*)_{hetero}$ and $I_{homo} < I_{hetero}$

4. ✖ $(\Delta G^*)_{homo}$ and I_{homo} can be greater than or less than $(\Delta G^*)_{hetero}$ and I_{hetero}

Question Number : 77 Question Id : 7877323197 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If a hypereutectoid steel sample is heated to 1000°C in a furnace and then continuously cooled in air to room temperature then the microstructure obtained will be

Options :

1. ✖ Pearlite + Bainite

2. ✖ Pearlite + Martensite

3. ✖ Pearlite +Ferrite

4. ✔ Pearlite + Cementite

Question Number : 78 Question Id : 7877323198 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For some arbitrary reaction, the change in free energy is negative ($\Delta G < 0$). Then, which one of the following statements is correct

Options :

1. ✔ The reaction is spontaneous but it may or may not happen of its own.

2. ✖ The reaction is spontaneous and will happen of its own.

3. ✖ The reaction is non-spontaneous and will happen of its own.

4. ✖ The reaction is non-spontaneous and will not happen of its own

Question Number : 79 Question Id : 7877323199 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

During interface-controlled growth, with increase in the degree of undercooling the growth rate

Options :

1.

✖ Always increases

2. ✖ Always decreases

3. ✔ First increases then decreases

4. ✖ First decreases then increases

Question Number : 80 Question Id : 7877323200 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

At the peak aged condition, the alloy will have _____.

Options :

1. ✔ Large number of fine precipitates

2. ✖ Large number of coarse precipitates

3. ✖ Small number of fine precipitates

4. ✖ Small number of coarse precipitates

Question Number : 81 Question Id : 7877323201 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Interstitial diffusion is faster than the vacancy diffusion in solid state diffusion due to

Options :

1. ✖ Small probability of finding a free interstitial site around interstitial atom in case of interstitial diffusion

2. ✔ High probability of finding a free interstitial site around interstitial atom in case of interstitial diffusion

3. ✖ Small activation energy required for vacancy diffusion

4. ✖ Large activation energy required for interstitial diffusion

Question Number : 82 Question Id : 7877323202 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Choose the correct statement related to the heat treatment practices

Options :

1. ✖ Pearlite is a phase similar to the other phases of steel.

2. ✖ Martensite forms due to air cooling of low carbon steel

3. ✔ Pearlite becomes finer with increase in cooling rate.

4. ✖ The crystal structure of austenite is BCT.

Question Number : 83 Question Id : 7877323203 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 incorrect for diffusion-controlled growth?

Options :

1. ✖ Parabolic growth

2. ✖ Growth is proportional to supersaturation

3. ✖ Velocity is inversely proportional to time

4. ✔ Growth rate is constant for a given undercooling

Question Number : 84 Question Id : 7877323204 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 property of the material is required for the residual stress measurement from XRD?

Options :

1. ✔ X-ray elastic constant

2. ✖ Hardness of the material

3. ✖ Bragg angle

4. ✖ Atomic number

Question Number : 85 Question Id : 7877323205 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Scanning electron microscope is operated in Secondary electron mode to get better _____

Options :

1. ✖ Elemental contrast

2. ✖ Crystallographic details

3. ✔ Topographical contrast

4. ✖ Image quality

Question Number : 86 Question Id : 7877323206 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 the correct pathway of electrons in the TEM?

Options :

1. ✖ anode → electromagnetic lens system → sample → fluorescent screen

2. ✔ anode → electromagnetic lens system → sample → electromagnetic lens system → fluorescent screen

3. ✖ cathode → electromagnetic lens system → sample → electromagnetic lens system → fluorescent screen

4. ✖ cathode → electromagnetic lens system → sample → fluorescent screen

Question Number : 87 Question Id : 7877323207 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 false for the matrix phase in a composite?

Options :

1. ✖ Bind fibers together

2. ✖ Serves as a barrier to crack propagation

3. ✖ Transmit and distribute externally applied stress to fibers

4. ✔ Higher elastic modulus than fiber

Question Number : 88 Question Id : 7877323208 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Al-alloys for automobile parts are reinforced to increase

Options :

1. ✖ Strength

2. ✔ Wear resistance

3. ✖ Elastic modulus

4. ✖ Density

Question Number : 89 Question Id : 7877323209 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For transmitting the electrical energy over a long distance, the general preferred material is

Options :

1. ✖ Copper

2. ✔ Steel-reinforced aluminium

3. ✖ Aluminium reinforced copper

4. ✖ Aluminium reinforced silver wire

Question Number : 90 Question Id : 7877323210 Display Question Number : Yes Is Question

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

During electron-specimen interaction which of the following signals are not being used in TEM?

Options :

1. ✖ Elastically scattered electrons

2. ✖ Inelastically scattered electrons

3. ✔ Secondary electrons

4. ✖ Transmitted electrons

Question Number : 91 Question Id : 7877323211 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 used for making cavities and hollow projections in casting?

Options :

1. ✔ Core

2. ✖ Core print

3. ✖ Muller

4. ✖ Padding

Question Number : 92 Question Id : 7877323212 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In casting, gating ratio is defined as the ratio of

Options :

1. ✔ Sprue area : total runner area : total gate area

2. ✖ Total gate area : sprue area : total runner area

3. ✖ Total runner area : sprue area : total gate area

4. ✖ Total runner area : total gate area : sprue area

Question Number : 93 Question Id : 7877323213 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The directional solidification in casting can be improved by using

Options :

1. ✖ Chills and chaplets

2. ✖ Chaplets and padding

3. ✔ Chills and padding

4. ✖ Chills, chaplets and padding

Question Number : 94 Question Id : 7877323214 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 defects are likely to be caused because of improper ramming of moulding material?

(i) Cold shut

(ii) Misrun

(iii) Swell

(iv) Drop

(v) Metal penetration

(vi) Shift

Options :

1. ✖ i, iii and vi only

2. ✖ ii, iv and vi only

3. ✔ iii, iv and v only

4. ✖ ii, v and vi only

Question Number : 95 Question Id : 7877323215 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In forging operation, the sticking friction condition occurs near the _____while sliding friction condition occurs near the _____

Options :

1. ✖ Center and ends

2. ✖ Center and center

3. ✔ Ends and center

4. ✖ Ends and ends

Question Number : 96 Question Id : 7877323216 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Cold working of steel is defined as working

Options :

1. ✔ Below its recrystallization temperature

2. ✖ Above its recrystallization temperature

3. ✖ At its recrystallization temperature

4. ✖ At two thirds of the melting temperature of the metal

Question Number : 97 Question Id : 7877323217 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

With respect to metal working, match the following

P: Defect in extrusion	I: Alligatoring
Q: Defect in rolling	II: Scab
R: Product of skew rolling	III: Fish tail
S: Product of rolling through cluster mill	IV: Seamless tube
	V: Thin sheet with tight tolerance
	VI: Semi-finished balls of ball bearing

Options :

1. ✖ P-II, Q-III, R-VI, S-V

2. ✔ P-III, Q-I, R-VI, S-V

3. ✖ P-III, Q-I, R-IV, S-VI

4. ✖ P-I, Q-II, R-V, S-VI

Question Number : 98 Question Id : 7877323218 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 true strain produced in compressing a cylinder to half its original length is

Options :

1. ✖ 0.5

2. ✖ -0.5

3. ✖ 0.69

4. ✔ -0.69

Question Number : 99 Question Id : 7877323219 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a two-stage wire drawing operation, the fractional reduction (ratio of change in cross sectional area to initial cross-sectional area) In the first stage is 0.4. The fractional reduction in the second stage is 0.3. The overall fractional reduction is

Options :

1. ✔ 0.58

2. ✖ 0.24

3. ✖ 0.60

4. ✖ 1.00

Question Number : 100 Question Id : 7877323220 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A test specimen is stressed slightly beyond the yield point and then unloaded. Its yield strength

Options :

1. ✖ Decreases

2. ✔ Increases

3. ✖ Remains same

4. ✖ Becomes equal to UTS

Question Number : 101 Question Id : 7877323221 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In rolling of a flat strip, the relative velocity of strip with respect to the roller is

Options :

1. ✖ Positive throughout from entry to exit plane

2. ✖ Positive at entry plane, negative at exit plane

3. ✖ Negative throughout from entry to exit plane

4. ✔ Negative at entry plane, positive at exit plane

Question Number : 102 Question Id : 7877323222 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Argon is preferred as shielding gas over helium during most inert gas welding processes due to

P. Argon has higher ionization potential over helium

Q. Argon is heavier than helium

Options :

1. ✖ P

2. ✔ Q

3. ✖ P and Q

4. ✖ Neither P nor Q

Question Number : 103 Question Id : 7877323223 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Spatter is a welding defect associated with the following type of metal transfer

Options :

1. ✖ Spray transfer

2. ✔ Globular transfer

3. ✖ Short circuit transfer

4. ✖ Pulse current mode of transfer

Question Number : 104 Question Id : 7877323224 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 Cr_{eq}/ Ni_{eq} ratio required for solving hot cracking in the Austenitic stainless steels welding?

Options :

1. ✔ 1.5

2. ✖ 0.8

3. ✖ 2.2

4. ✖ 0.5

Question Number : 105 Question Id : 7877323225 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How do you resolve low HAZ toughness issue associated with carbon and low alloy steels?

Options :

1. ✖ Keep proper Mn/S ratio

2. ✔ Use carbide and nitride formers

3. ✖ Add deoxidizers in filler metal

4. ✖ Post heating treatment

Question Number : 106 Question Id : 7877323226 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Find the incorrect statement about Cold cracking associated with steels.

Options :

1. ✖ It occurs due to presence of residual stresses in the material during cooling which can decrease the strength of the base material and can lead to catastrophic failure

2. ✖ It occurs in the heat-affected zone of the base material.

3. ✔ It is associated with the weld region of the base material as it solidifies

4. ✖ It also occurs due to the presence of hydrogen in the material

Question Number : 107 Question Id : 7877323227 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Knife line attack is observed in

Options :

1. ✖ Austenitic stainless steels

2. ✔ Stabilized austenitic stainless steels

3. ✖ Low carbon steels

4. ✖ Precipitation hardened stainless steels

Question Number : 108 Question Id : 7877323228 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Piezo- electric probe is used in which of the following techniques

Options :

1. ✖ Acoustic emission

2. ✖ Radiography

3. ✔ Ultrasonic testing

4. ✖ Liquid penetrant testing (LPT)

Question Number : 109 Question Id : 7877323229 Display Question Number : Yes Is Question

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

Liquid penetrant testing can be used to detect

Options :

1. ✖ internal porosity in the casting

2. ✖ corrosion wall thinning in pipes and tubes

3. ✖ residual stresses in steels

4. ✔ fatigue cracks in magnesium alloy components

Question Number : 110 Question Id : 7877323230 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What criteria should be followed for choosing a right filler wire to solve hot cracking problem in Al alloys?

Options :

1. ✖ Filler wire must have low hydrogen content

2. ✖ Filler wire must be stronger than the base material

3. ✔ Filler wire must produce back filling effect

Filler wire must produce grain boundary liquid film

4. ✖

Question Number : 111 Question Id : 7877323231 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Sum of the series $\sum_{n=1}^{\infty}\left(\frac{3}{n(n+1)}+\frac{1}{2^n}\right)$ is

Options :

1. ✖ $\frac{3}{2}$

2. ✖ $\frac{5}{2}$

3. ✖ 1

4. ✔ 4

Question Number : 112 Question Id : 7877323232 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 $\iint_S F.ds$, where $F(x,y,z)=3xy^2\,i+xe^z\,j+z^3\,k$ and S is the surface of solid bounded by the cylinder $y^2+z^2=1$ and the planes $x=-1$ and $x=2$ is

Options :

1. ✖ π

2. ✖ 2π

3. ✖ $\frac{3\pi}{4}$

4. ✔ $\frac{9\pi}{2}$

Question Number : 113 Question Id : 7877323233 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The shortest distance from the point $(1,0,-2)$ to the plane $x+2y+z=4$ is

Options :

1. ✖ $\frac{11}{6}$

2. ✖ $\frac{5}{6}$

3. ✔ $\frac{5}{6}\sqrt{6}$

4. ✖

$\frac{15}{\sqrt{6}}$

Question Number : 114 Question Id : 7877323234 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The solution of the differential equation $\left(1+e^{\frac{x}{y}}\right)dx+e^{\frac{x}{y}}\left(1-\frac{x}{y}\right)dy=0$ is

Options :

1. ✖ $y+x\,e^{\frac{x}{y}}=C$

2. ✔ $x+y\,e^{\frac{x}{y}}=C$

3. ✖ $y-x\,e^{\frac{x}{y}}=C$

4. ✖ $x+y\,e^{-\frac{x}{y}}=C$

Question Number : 115 Question Id : 7877323235 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The solution of the initial value problem

$\frac{d^2y}{dx^2}+2\frac{dy}{dx}+y=0;\;\; y(0)=1,\;\frac{dy}{dx}(0)=0$ at $x=1$ is

Options :

1. ✖ $\frac{2}{e}-1$

2. ✔ $\frac{2}{e}$

3. ✖ $\frac{2}{e}+1$

4. ✖ $\frac{2}{e^2}$

Question Number : 116 Question Id : 7877323236 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the mean and variance of binomial variate X are 2 and 1 respectively, then the probability that X takes a value at least one is

Options :

1. ✖ $\frac{1}{16}$

2. ✖ $\frac{8}{16}$

3. ✖

$\frac{10}{16}$

$\frac{15}{16}$

4. ✔

Question Number : 117 Question Id : 7877323237 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let X be normal with mean 50 and variance 9. The value of C such that $P(X > C) = 0.01$ is

$(use\ \varphi(2.32) = 0.9898, \varphi(2.33) = 0.9901)$

Options :

1. ✖ 57.05

2. ✔ 56.97

3. ✖ 55.89

4. ✖ 54.38

Question Number : 118 Question Id : 7877323238 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $f(x) = \begin{vmatrix} \cos x & x & 1 \\ 2\sin x & x^2 & 2x \\ \tan x & x & 1 \end{vmatrix}$. Then $\lim_{x \to 0} \frac{\frac{df}{dx}}{x}$ is

Options :

1. ✖ 1

2. ✖ 2

3. ✔ -2

4. ✖ 0

Question Number : 119 Question Id : 7877323239 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The largest eigen value of A^3, where $A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & -4 & 2 \\ 0 & 0 & 7 \end{bmatrix}$ is

Options :

1. ✖ 0

2. ✖ 64

3. ✖ 1

4. ✔ 343

Question Number : 120 Question Id : 7877323240 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The quadrature formula $\int_{-1}^{1} f(x)dx = C_0 f(-1) + C_1 f(0) + C_2 f(1)$ is exact for all polynomials of degree less than or equal to 2. Then the values of $C_0, C_1,$ and C_2 are

Options :

1. ✔ $\frac{1}{3}, \frac{4}{3}, \frac{1}{3}$

2. ✖ $\frac{1}{4}, \frac{1}{2}, \frac{1}{4}$

3. ✖ $\frac{2}{3}, \frac{4}{3}, \frac{2}{3}$

4. ✖ $\frac{2}{3}, \frac{1}{3}, \frac{2}{3}$