

Telangana State Council Higher Education

Notations :

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

Question Paper Name :Metallurgical Engineering 30th May 2026
Shift 2**Subject Name :**

Metallurgical Engineering

Creation Date :

2026-05-30 16:34:56

Duration :

120

Total Marks :

120

Display Marks:

Yes

Share Answer Key With Delivery Engine :

Yes

Actual Answer Key :

Yes

Change Font Color :

No

Change Background Color :

No

Change Theme :

No

Help Button :

No

Show Reports :

No

Show Progress Bar :

No

Metallurgical Engineering

Group Number :

1

Group Id :

10513124

Group Maximum Duration :

0

Group Minimum Duration :

120

Show Attended Group? :

No

Edit Attended Group? :

No

Break time :

0

Group Marks :

120

Mathematics

Section Id :

10513160

Section Number :

1

Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	10
Section Marks :	10
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	10513160
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 1051313241 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $\begin{bmatrix} 1 \\ 1 \end{bmatrix}$ is an eigenvector of the matrix $\begin{bmatrix} m & 3 \\ 3 & m \end{bmatrix}$ then the corresponding eigenvalue is

Options :

1. ✖ $m - 3$
2. ✔ $m + 3$
3. ✖ m
4. ✖ $3m$

Question Number : 2 Question Id : 1051313242 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The non-homogeneous system of equations given by $x - 2y + 3z = 6$, $3x + y - 4z = -7$,
and $5x - 3y + 2z = 5$ has

Options :

1. ✖ No solution
2. ✖ Unique solution
3. ✔ Infinite number solutions
4. ✖ Zero solution

Question Number : 3 Question Id : 1051313243 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following series is divergent?

Options :

1. ✓ $\sum \sin\left(\frac{1}{n}\right)$

2. ✗ $\sum \left(1 + \frac{1}{\sqrt{n}}\right)^{-n^{\left(\frac{3}{2}\right)}}$

3. ✗ $\sum \left(1 + \frac{1}{n}\right)^{-n^2}$

4. ✗ $\sum_{n=2}^{\infty} \frac{1}{(\log n)^n}$

Question Number : 4 Question Id : 1051313244 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $f(x) = e^{-x}$ in $(-1, 1)$ and the Fourier series of $f(x) = \frac{a_0}{2} + \sum_{n=1}^{\infty} (a_n \cos nx + b_n \sin nx)$,

then the Fourier coefficient a_0 is

Options :

1. ✗ 1

2. ✗ 0

3. ✗ $2 \cosh 1$

4. ✓ $2 \sinh 1$

Question Number : 5 Question Id : 1051313245 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $\hat{f} = (x + 2y + az)\hat{i} + (bx - 3y - z)\hat{j} + (4x + cy + 2z)\hat{k}$ is an irrotational vector, then the values of (a, b, c) are

Options :

1. ✖ (1, 4, 2)
2. ✖ (4, 2, 1)
3. ✔ (4, 2, -1)
4. ✖ (2, 4, -1)

Question Number : 6 Question Id : 1051313246 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $e^{\sin x}$ is an integrating factor of the differential equation

$\frac{dy}{dx} + (y - 1)\cos x = e^{-\sin x} \cos x$, then the general solution of the equation is $y =$

Options :

1. ✖ $(e^{\sin x} + c)e^{-\sin x}$
2. ✔ $(\sin x + e^{\sin x} + c)e^{-\sin x}$
3. ✖ $(\cos x + e^{\sin x} + c)e^{-\sin x}$
4. ✖ $(\cos x + e^{\cos x} + c)e^{-\sin x}$

Question Number : 7 Question Id : 1051313247 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The unit step function $u(t-2)$ is defined by $u(t-2) = \begin{cases} 0, & \text{if } t < 2 \\ 1, & \text{if } t \geq 2 \end{cases}$ then $L\{t u(t-2)\} =$

Options :

1. ✖ $\frac{e^{-2s}}{s}$

2. ✖ $\frac{e^{-2s}(2s+1)}{s}$

3. ✔ $\frac{e^{-2s}(2s+1)}{s^2}$

4. ✖ $\frac{e^{-2s}(2s+1)}{s^3}$

Question Number : 8 Question Id : 1051313248 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Using Runge-Kutta method, when $\frac{dy}{dx} = xy + y^2$, $y(0) = 1$ is solved by taking $h = 0.1$,

then in the usual notation the value of $k_1 =$

Options :

1. ✖ 0.001

2. ✖ 0.0001

3. ✖ 0.01

4. ✔ 0.1

Question Number : 9 Question Id : 1051313249 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $X \sim N(\mu, \sigma^2)$ then

Options :

1. ✖ $P(X < \mu) = 1$
2. ✔ $P(X = \mu) = 0$
3. ✖ $P(X > \mu) = 0$
4. ✖ $P(X = \mu) = 0.5$

Question Number : 10 Question Id : 1051313250 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Assertion(A): Spearman rank correlation coefficient is used for ordinal data.

Reason(R): It is based on ranks rather than actual values.

The correct answer is

Options :

1. ✔ A and R are True, R is the correct explanation of A
2. ✖ A and R are True, R is not the correct explanation of A
3. ✖ A is true, but R is false
4. ✖ A is false, but R is true

Metallurgical Engineering

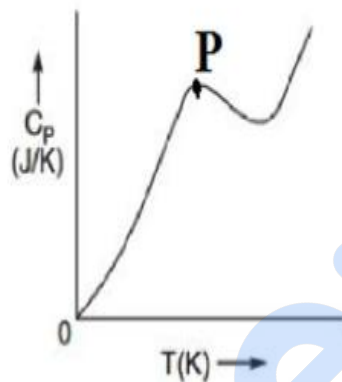
Section Id :	10513161
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	110
Number of Questions to be attempted :	110

Section Marks :	110
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	10513161
Question Shuffling Allowed :	Yes

Question Number : 11 Question Id : 1051313251 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The figure given below shows the variation of heat capacity with temperature for Nickel in temperature range 0 to 800 K. If the increasing curve discontinues at point P, then this discontinuity is due to



Options :

1. ✓ Magnetic transformation of Nickel bar
2. ✗ Change due to inclusions in Nickel bar
3. ✗ Change due to porosity in Nickel bar
4. ✗ Change in dimensions of Nickel bar

Question Number : 12 Question Id : 1051313252 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match the following

Slope Characteristic		Significance in Ellingham Diagram	
A	Slope of $\Delta G^\circ - T$ line equals $-\Delta S^\circ$	I	Negligible entropy change with temperature
B	Large negative slope	II	Entropy change of oxidation reaction
C	Nearly horizontal Ellingham line	III	Significant decrease in gaseous disorder
D	Parallel Ellingham lines	IV	Similar entropy change for reactions

The correct answer is

Options :

1. ✓ A-II, B-III, C-I, D-IV
2. ✗ A-I, B-II, C-IV, D-III
3. ✗ A-II, B-I, C-III, D-IV
4. ✗ A-III, B-IV, C-II, D-I

Question Number : 13 Question Id : 1051313253 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is correct for the entropy change for a reversible process?

Options :

1. ✗ $\Delta S_{\text{system}} + \Delta S_{\text{surroundings}} > 0$
2. ✗ $\Delta S_{\text{system}} < 0$
3. ✓ $\Delta S_{\text{system}} + \Delta S_{\text{surroundings}} = 0$
4. ✗ $\Delta S_{\text{surroundings}} = 0$

Question Number : 14 Question Id : 1051313254 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Integration of Clausius - Clapeyron equation by assuming that ΔH_v (heat of vaporization) remains constant, the plot $\ln P$ vs. $\left(\frac{1}{T}\right)$ will be straight line, then the slope will be

Options :

1. ✖ $\left(\frac{\Delta H_v}{R}\right)$

2. ✔ $-\left(\frac{\Delta H_v}{R}\right)$

3. ✖ $\left(\frac{R}{\Delta H_v}\right)$

4. ✖ $-\left(\frac{R}{\Delta H_v}\right)$

Question Number : 15 Question Id : 1051313255 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The quantity that balances the chemical driving force of a reversible electrochemical reaction is

Options :

1. ✖ Entropy change

2. ✖ Electric current

3. ✔ Electromotive force

4. ✖ Internal energy

Question Number : 16 Question Id : 1051313256 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The cell having identical electrodes with different concentrations of electrolytes is

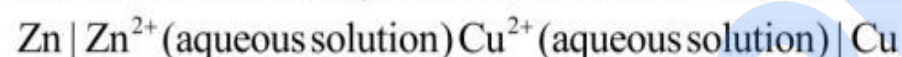
Options :

1. ✖ Battery cell
2. ✖ Galvanic cell
3. ✖ Electrolytic cell
4. ✔ Concentration cell

Question Number : 17 Question Id : 1051313257 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Consider the following Daniell Cell and identify the incorrect statement.



Options :

1. ✖ Zinc acts as the anode
2. ✔ Copper undergoes oxidation
3. ✖ Sulphate ions migrate to maintain charge balance
4. ✖ EMF depends on electrolyte concentration

Question Number : 18 Question Id : 1051313258 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Pitting corrosion is dangerous in thin sections. This is mainly due to

Options :

1. ✖ Uniform metal thinning
2. ✖ Formation of protective corrosion products
3. ✔ Pits detection is difficult due to the small size

4. ✖ High cathodic overpotential

Question Number : 19 Question Id : 1051313259 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match the following

Microstructural features		Causes for corrosion	
A	Grain boundaries	I	Reduced electrochemical activity
B	Dislocations	II	Formation of galvanic microcells
C	Pearlite	III	High energy areas
		IV	High energy lines

The correct answer is

Options :

1. ✖ A-I, B-II, C-IV
2. ✖ A-III, B-I, C-II
3. ✖ A-IV, B-III, C-I
4. ✔ A-III, B-IV, C-II

Question Number : 20 Question Id : 1051313260 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In transient heat conduction, the lumped capacitance method is valid only when

Options :

1. ✖ Internal conduction resistance is greater than surface convection resistance
2. ✔ Biot number is less than 0.1
3. ✖ Fourier number is less than 1
4. ✖ Thermal diffusivity is very high

Question Number : 21 Question Id : 1051313261 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statement is correct?

Options :

1. ✓ Thermal conductivity of gases decreases with temperature
2. ✗ In good conductors, thermal conductivity increases with temperature
3. ✗ In insulators, thermal conductivity decreases with temperature
4. ✗ Liquids (water) have higher thermal conductivity than metals and alloys

Question Number : 22 Question Id : 1051313262 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The negative sign in Fick's first law indicates that diffusion flux occurs

Options :

1. ✗ Along increasing concentration
2. ✗ Independent of concentration gradient
3. ✓ Opposite to the concentration gradient
4. ✗ Only at equilibrium

Question Number : 23 Question Id : 1051313263 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match the following:

Formation of Voids		Mechanism	
A	Vacancy creation	I	Impurity particles
B	Vacancy annihilation	II	Hydrostatic compression
C	Void nucleation	III	Negative dislocation climb
D	Stress suppression of pores	IV	Positive dislocation climb

The correct answer is

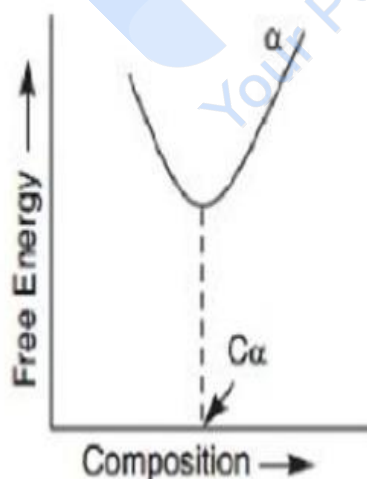
Options :

1. ✓ A-III, B-IV, C-I, D-II
2. ✗ A-I, B-II, C-III, D-IV
3. ✗ A-IV, B-III, C-II, D-I
4. ✗ A-III, B-IV, C-II, D-I

Question Number : 24 Question Id : 1051313264 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The figure shows a free energy (G) Vs composition for a single-phase solid solution (α). At composition C_α , the free energy curve has a minimum.



Which of the following statements is correct?

Options :

1. ✗ The composition C_α corresponds to an unstable equilibrium state
2. ✗ The composition C_α corresponds to a metastable state

3. ✖ The composition C_α represents a phase boundary composition
4. ✔ The composition C_α corresponds to the stable composition of the α phase

Question Number : 25 Question Id : 1051313265 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Given below are three statements:

Statement-I: An isolated system exchange matter and energy with its surroundings

Statement-II: A closed system exchange only energy with its surroundings

Statement-III: An open system does not exchange both matter and energy with its surroundings

The correct answer is

Options :

1. ✖ Both Statement-I and Statement-II are correct
2. ✖ Both Statement-II and Statement-III are correct
3. ✔ Only Statement-II is correct
4. ✖ Only Statement-III is correct

Question Number : 26 Question Id : 1051313266 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The ratio of any two extensive properties is independent of

Options :

1. ✔ Total mass
2. ✖ Total heat
3. ✖ Total system
4. ✖ Total time

Question Number : 27 Question Id : 1051313267 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is true for adiabatic process?

Options :

1. ✖ The temperature remains constant throughout the process
2. ✖ All heat absorbed is equal to work done on the system
3. ✔ Energy change is equal to work done on the system
4. ✖ Energy is static variable and dependent on the path

Question Number : 28 Question Id : 1051313268 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the incorrect statement

Options :

1. ✖ Activity of an ideal gas which is equal to its partial pressure is unity
2. ✖ Activity of non-ideal gas which is equal to its fugacity is unity
3. ✔ The activity of pure solid and liquid in its standard state is equal to unity

Activity is the ratio of fugacity of the substance in its actual state to its fugacity in its

4. ✖ standard state

Question Number : 29 Question Id : 1051313269 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

According to Trouton's rule, the energy of vaporization of a crystal is primarily related to

Options :

1. ✖ Its heat of fusion

2. ✖ Its fusion temperature
3. ✔ Its boiling temperature
4. ✖ Its crystal structure

Question Number : 30 Question Id : 1051313270 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The quantity that represents the change in temperature of a given gas with pressure when the enthalpy is kept constant is called

Options :

1. ✖ Thermal expansion coefficient
2. ✔ Joule–Thomson coefficient
3. ✖ Compressibility factor
4. ✖ Isothermal pressure coefficient

Question Number : 31 Question Id : 1051313271 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which factor mainly controls permeability in the bosh region of a blast furnace?

Options :

1. ✖ Slag basicity
2. ✔ Coke strength and size
3. ✖ Iron ore reducibility
4. ✖ Blast temperature

Question Number : 32 Question Id : 1051313272 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The dead-man zone in a blast furnace mainly consists of

Options :

1. ✖ Molten slag
2. ✖ Molten iron
3. ✔ Undissolved solid coke particles
4. ✖ Reduced iron fines

Question Number : 33 Question Id : 1051313273 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which condition is not essential for desulphurization in an LD converter?

Options :

1. ✖ High temperature
2. ✖ Basic slag
3. ✔ High viscosity and low fluidity of slag
4. ✖ Good slag-metal contact

Question Number : 34 Question Id : 1051313274 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The primary reason for tapering of blast furnace walls in the bosh region is to

Options :

1. ✔ Compensate for decrease in apparent burden volume
2. ✖ Improve slag foaming

3. ✖ Increase heat losses

4. ✖ Increase raceway depth

Question Number : 35 Question Id : 1051313275 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match the following:

Process		FeO content	
A	Blast Furnace slag	I	Lower FeO
B	DRI	II	Higher FeO
C	Gas-based DR	III	Nearly zero
D	Coal-based DR	IV	Always present

Choose the correct option

Options :

1. ✔ A-III, B-IV, C-I, D-II

2. ✖ A-II, B-I, C-III, D-IV

3. ✖ A-I, B-IV, C-II, D-III

4. ✖ A-III, B-II, C-IV, D-I

Question Number : 36 Question Id : 1051313276 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The slag with $V - \text{ratio} = \frac{\% \text{CaO}}{\% \text{SiO}_2}$ less than unity is classified as

Options :

1. ✖ Basic

2. ✖ Neutral

3. ✖ Amphoteric

4. ✓ Acidic

Question Number : 37 Question Id : 1051313277 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The concept of vacuum de-gassing was initially introduced primarily for the removal of

Options :

1. ✓ Hydrogen in liquid steel
2. ✗ Sulphur in liquid steel
3. ✗ Carbon in liquid steel
4. ✗ Manganese in liquid steel

Question Number : 38 Question Id : 1051313278 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Uranium extraction involves the preparation of Uranium tetrafluoride by hydrofluorination from

Options :

1. ✓ Uranium dioxide
2. ✗ Uranyl nitrate
3. ✗ Uranium trioxide
4. ✗ Uranium Phosphate

Question Number : 39 Question Id : 1051313279 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In extraction of thorium, ThCl_4 is prepared from

Options :

1. ✓ Thorium oxalate
2. ✗ Thorium hydroxide
3. ✗ Thorium sulphate
4. ✗ Thorium carbonate

Question Number : 40 Question Id : 1051313280 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Roasting is not necessary for

Options :

Copper concentrates having high iron sulphide content and a low copper sulphide

1. ✗ content ($< 25\%$)
2. ✓ High grade copper concentrates ($> 30\% \text{ Cu}$)
3. ✗ Loss of Copper from the copper concentrate
4. ✗ Elimination of Sulphur from Copper concentrates having iron sulphide content

Question Number : 41 Question Id : 1051313281 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a three-layer refining of Aluminium, the impure Aluminium is alloyed with which of the metals to form a bottom layer

Options :

1. ✗ Titanium
2. ✗ Manganese
3. ✗ Nickel

4. ✓ Copper

Question Number : 42 Question Id : 1051313282 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Blue powder is the byproduct of Zinc extractions and it contains mainly

Options :

1. ✓ Mixture of zinc and zinc oxide
2. ✗ Mixture of zinc and zinc sulphide
3. ✗ Mixture of zinc oxide and zinc hydride
4. ✗ Mixture of zinc sulphide and zinc oxide

Question Number : 43 Question Id : 1051313283 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Beach marks are observed in

Options :

1. ✓ Impact failure
2. ✗ Tensile failure
3. ✗ Shear failure
4. ✗ Fatigue failure

Question Number : 44 Question Id : 1051313284 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Magnesium cannot be obtained by the electrolysis of Magnesium Chloride or Magnesium Sulphate salts in water because

Options :

1. ✓ Hydrogen is evolved before Mg is deposited
2. ✗ Reduction potential of Mg^{2+} ions are much higher than that of water
3. ✗ Mg is dissolved in solution
4. ✗ Use of amalgam cathode increases the Mg deposition potential

Question Number : 45 Question Id : 1051313285 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The kinetics of the Pidgeon process is controlled by

Options :

1. ✗ H_2O vapour
2. ✓ SiO vapour
3. ✗ MgO vapour
4. ✗ H_2 vapour

Question Number : 46 Question Id : 1051313286 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In the Mond process, nickel reacts with carbon monoxide to form

Options :

1. ✗ NiO
2. ✗ Ni_2O
3. ✗ NiCO
4. ✓ $\text{Ni}(\text{CO})_4$

Question Number : 47 Question Id : 1051313287 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following metals doesn't have face centered cubic (fcc) crystal structure?

Options :

1. ✖ Copper
2. ✖ Nickel
3. ✖ Silver
4. ✔ Sodium

Question Number : 48 Question Id : 1051313288 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match the following

Ore product		Meaning	
A	Concentrate	I	Enriched mineral or high concentration of the valuable mineral
B	Tailings	II	Unwanted minerals found in the ore before processing
C	Middlings	III	Waste materials left over after the processing
D	Gangue	IV	Intermediate material needs more processing

The correct answer is

Options :

1. ✔ A-I, B-III, C-IV, D-II
2. ✖ A-II, B-III, C-I, D-IV
3. ✖ A-IV, B-I, C-II, D-III
4. ✖ A-III, B-II, C-I, D-IV

Question Number : 49 Question Id : 1051313289 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Jigging operation depends on the difference in

Options :

1. ✖ Surface chemistry
2. ✖ Electrical conductivity
3. ✔ Specific gravity
4. ✖ Magnetic susceptibility

Question Number : 50 Question Id : 1051313290 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which industrial processes use heavy suspension?

Options :

1. ✖ Lessing Process
2. ✖ Bertrand process
3. ✖ DuPont process
4. ✔ Chance sand-flotation process

Question Number : 51 Question Id : 1051313291 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The stress at which the stress-strain curve deviates from linearity is

Options :

1. ✖ Endurance limit
2. ✔ Proportionality limit
3. ✖ Elastic limit
4. ✖ No limit

Question Number : 52 Question Id : 1051313292 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is not related to Mohr's circle in three dimensions?

Options :

1. ✖ Determining principal stresses
2. ✖ Calculating maximum shear stress
3. ✖ Visualizing stress on any plane
4. ✔ Determining elastic modulus

Question Number : 53 Question Id : 1051313293 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The basis on which the Von Mises' criterion is preferred compared to maximum-shear stress criterion theoretically is

Options :

1. ✖ It has lower accuracy
2. ✔ It considers all three principal stresses
3. ✖ It considers the maximum shear stress
4. ✖ Its energy is associated with the change of volume of the material

Question Number : 54 Question Id : 1051313294 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

An example of a liquid metal mixture which produces near ideal solutions is

Options :

1. ✖ Copper - Magnesium

2. ✖ Bismuth - Cadmium
3. ✖ Iron - Silver
4. ✔ Bismuth - Tin

Question Number : 55 Question Id : 1051313295 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The effect of ferrite stabilizers on Fe – Fe₃C phase diagram is

Options :

1. ✖ Lowers A₁ point and raises A₄ point
2. ✖ Increases the austenite region
3. ✔ Decreases the amount of carbon in gamma iron
4. ✖ Raises the eutectoid temperature

Question Number : 56 Question Id : 1051313296 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Nitrogen pickup by liquid steel is low in

Options :

1. ✔ LD process
2. ✖ Bessemer process
3. ✖ Open-hearth process
4. ✖ Twin hearth process

Question Number : 57 Question Id : 1051313297 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following metal has low stacking fault energy?

Options :

1. ✖ Gold
2. ✔ Silver
3. ✖ Copper
4. ✖ Nickel

Question Number : 58 Question Id : 1051313298 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Dislocations with burgers vectors b_1 and b_2 , combine to produce a resultant dislocation b_3 .

The vector b_3 , is given by the vector sum of b_1 and b_2 , the dissociation reaction $b_1 \rightarrow b_2 + b_3$ will occur when

Options :

1. ✔ $b_1^2 > b_2^2 + b_3^2$
2. ✖ $b_1^2 < b_2^2 + b_3^2$
3. ✖ $b_1^2 = b_2^2 + b_3^2$
4. ✖ $b_1^2 \div b_2^2 + b_3^2$

Question Number : 59 Question Id : 1051313299 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

“Dislocation lines are not straight but rather dislocation lines are flexible” is given by

Options :

1. ✔ Mott and Nabarro

2. ✘ Taylor and Quinney
3. ✘ Frank and Read
4. ✘ Cottrell and Bilby

Question Number : 60 Question Id : 1051313300 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The shear stress required to move a dislocation through a crystal lattice in a particular direction is called

Options :

1. ✘ Critical resolved shear stress
2. ✘ Flow stress
3. ✘ Hoop stress
4. ✔ Peierls stress

Question Number : 61 Question Id : 1051313301 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is not a mechanism by which solute atoms interact with dislocations?

Options :

1. ✘ Elastic interaction
2. ✔ Magnetic interaction
3. ✘ Stacking-fault interaction
4. ✘ Electrical interaction

Question Number : 62 Question Id : 1051313302 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The sensitivity of fracture of brittle solids to surface conditions is termed as the

Options :

1. ✖ Hall–Petch effect
2. ✔ Joffe effect
3. ✖ Bauschinger effect
4. ✖ Portevin–Le Chatelier effect

Question Number : 63 Question Id : 1051313303 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The law which states that fracture occurs when the resolved normal stress on a plane reaches a critical value is

Options :

1. ✖ Griffith law
2. ✖ Nabbaro's law
3. ✔ Sohncke's law
4. ✖ Tresca criterion

Question Number : 64 Question Id : 1051313304 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Brittle fractures occur in a trans granular manner. If the grain boundaries contain a film of brittle constituent, the fracture will occur

Options :

1. ✔ In an intergranular manner along grain boundaries

2. ✖ By ductile rupture through the grains
3. ✖ With significant plastic deformation at grain boundaries
4. ✖ By cleavage independent of grain boundary condition

Question Number : 65 Question Id : 1051313305 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The analytical treatment of ductile fracture using a model of cylindrical holes with initial radius (b) and average spacing (L) was proposed by

Options :

1. ✖ Griffith
2. ✖ Orowan
3. ✖ Hall-Petch
4. ✔ McClintock

Question Number : 66 Question Id : 1051313306 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Consider the following

Assertion (A): A notch increases the tendency for brittle fracture in a material.

Reason (R): A notch produces high local stresses, introduces a triaxial tensile state of stress, causes local strain hardening, cracking and magnifies the local strain rate.

Choose the correct answer

Options :

1. ✔ Both A and R are true, and R is the correct explanation of A
2. ✖ Both A and R are true, but R is not the correct explanation of A
3. ✖ A is true, but R is false

4. ✖ A is false, but R is true

Question Number : 67 Question Id : 1051313307 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Consider the following

Assertion (A): The shape and magnitude of the stress–strain curve of a metal depend on its composition, heat treatment, prior plastic deformation, strain rate, temperature and state of stress during testing.

Reason (R): Tensile strength and yield strength are strength parameters, whereas percent elongation and reduction of area are measures of ductility.

Choose the correct answer

Options :

1. ✖ Both A and R are true, and R is the correct explanation of A
2. ✔ Both A and R are true, but R is not the correct explanation of A
3. ✖ A is true, but R is false
4. ✖ A is false, but R is true

Question Number : 68 Question Id : 1051313308 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The fundamental assumption behind Barba's law in tensile testing is that

Options :

1. ✖ Plastic deformation remains uniform up to fracture
2. ✖ The elastic strain contribution is negligible
3. ✔ Specimens that are geometrically similar develop similar necked regions
4. ✖ Necking is governed only by material composition

Question Number : 69 Question Id : 1051313309 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In Dynamic hardness testing, the hardness is measured by

Options :

1. ✖ Size of the permanent indentation produced under a static load
2. ✖ Resistance to plastic deformation
3. ✔ Energy of impact
4. ✖ Diagonal length of the indentation by a pyramidal indenter

Question Number : 70 Question Id : 1051313310 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The correct statement for a cold-worked material is

Options :

1. ✖ Both Meyer and Brinell hardness increase with load
2. ✔ Meyer hardness is constant and independent of load
3. ✖ Brinell hardness remains constant with load
4. ✖ Meyer hardness decreases with increasing load

Question Number : 71 Question Id : 1051313311 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

According to Irwin, the local stresses near a crack depend on the product of

Options :

1. ✔ Nominal stress and square root of crack length
2. ✖ Nominal stress and crack length

- 3. ✖ Nominal strain and crack length
- 4. ✖ Yield stress and crack width

Question Number : 72 Question Id : 1051313312 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Fatigue data are commonly presented using

Options :

- 1. ✖ Maximum stress only
- 2. ✖ Mean stress and strain
- 3. ✖ Minimum stress only
- 4. ✔ Stress ratio and amplitude ratio

Question Number : 73 Question Id : 1051313313 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The two statistical methods used for making a statistical estimate of the fatigue limit are

Options :

- 1. ✖ Miner rule and Cumulative damage theory
- 2. ✔ Probit analysis and Staircase method
- 3. ✖ Goodman relation and Soderberg criterion
- 4. ✖ Basquin equation and Coffin–Manson relation

Question Number : 74 Question Id : 1051313314 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In Andrade's analysis of creep, the two components that together form the creep curve are

Options :

1. ✖ Elastic strain and plastic flow
2. ✖ Dislocation creep and diffusion creep
3. ✖ Primary creep and tertiary creep
4. ✔ Transient creep and constant-rate viscous creep

Question Number : 75 Question Id : 1051313315 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The creep mechanism observed at very low stresses with stress exponent $n = 1$ is given by

Options :

1. ✔ Harper–Dorn creep
2. ✖ Nabarro–Herring creep
3. ✖ Coble creep
4. ✖ Power-law breakdown creep

Question Number : 76 Question Id : 1051313316 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

With respect to mechanical behavior, ceramic materials are generally

Options :

1. ✖ Soft and highly ductile
2. ✖ Weak but very flexible
3. ✔ Stiff and strong compared to metals

4. ✖ Elastic with low stiffness

Question Number : 77 Question Id : 1051313317 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The incorrect statement about polymers is

Options :

1. ✔ Most polymers exhibit high electrical conductivity
2. ✖ Polymers are generally chemically inert in many environments
3. ✖ Many polymers are ductile and can be easily shaped into complex forms
4. ✖ Polymers are usually nonmagnetic in nature

Question Number : 78 Question Id : 1051313318 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statement is incorrect based on covalent bond characteristics?

Options :

1. ✔ Covalent bonds are non-directional in nature
2. ✖ Diamond has a very high hardness due to strong covalent bonding
3. ✖ Silicon and germanium form covalently bonded crystal structures
4. ✖ Covalent bonding involves shared electrons between atoms

Question Number : 79 Question Id : 1051313319 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match the following

Metal		Crystal structure & Atomic radius	
A	Molybdenum	I	FCC & 0.139 nm
B	Silver	II	BCC & 0.136 nm
C	Titanium (α)	III	HCP & 0.145 nm
D	Platinum	IV	FCC & 0.145 nm
E	Cadmium	V	HCP & 0.149 nm

Choose the correct option

Options :

1. ✓ A-II, B-IV, C-III, D-I, E-V
2. ✗ A-I, B-III, C-II, D-V, E-IV
3. ✗ A-III, B-IV, C-V, D-I, E-II
4. ✗ A-V, B-IV, C-III, D-II, E-I

Question Number : 80 Question Id : 1051313320 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The microstructure is revealed by the following surface treatment process, using an appropriate chemical reagent

Options :

1. ✗ Polishing
2. ✗ Grinding
3. ✗ Buffing
4. ✓ Etching

Question Number : 81 Question Id : 1051313321 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The sets of planes which can appear in an FCC diffraction pattern is

Options :

1. ✖ (100), (110), (111)
2. ✔ (111), (200), (220)
3. ✖ (110), (211), (310)
4. ✖ (100), (200), (210)

Question Number : 82 Question Id : 1051313322 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In an X-ray diffraction pattern, reflections from a BCC crystal will appear only when

Options :

1. ✖ h, k, l is all odd
2. ✖ h, k, l is all even
3. ✔ $h + k + l$ is an even number
4. ✖ $h + k + l$ is an odd number

Question Number : 83 Question Id : 1051313323 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following represents octahedral interstitial site in an FCC lattice?

Options :

1. ✖ $\left(\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right)$
2. ✔ $\left(\frac{1}{2}, \frac{1}{2}, \frac{1}{2}\right)$

3. ✖ $\left(\frac{1}{3}, \frac{1}{3}, \frac{1}{3}\right)$

4. ✖ $(0, 0, 0)$

Question Number : 84 Question Id : 1051313324 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The following statements describe the procedure for determining the Miller indices of a crystallographic plane, but they are not in the correct order. Arrange them in the proper sequence.

- I. The final set of integers is written within parentheses as $(h\ k\ l)$, representing the plane indices.
- II. The intercepts made by the plane on the x, y, and z axes are determined and denoted as a, b, and c.
- III. If the plane passes through the origin, an equivalent parallel plane is drawn or the origin is shifted to another lattice point.
- IV. The reciprocals of the intercepts are taken; an infinite intercept results in a zero index.
- V. The reciprocals are multiplied by the corresponding lattice parameters a, b, and c to normalize them.
- VI. The normalized values are converted into the smallest possible integers by multiplying or dividing by a common factor.

Chose the correct answer

Options :

1. ✔ III, II, IV, V, VI, I

2. ✖ III, IV, V, VI, II, I

3. ✖ II, III, IV, V, I, VI

4. ✖ IV, V, VI, III, II, I

Question Number : 85 Question Id : 1051313325 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

An electron micrograph shows a scale bar labeled $2\text{ }\mu\text{m}$. When measured on the printed image, the scale bar length is 15 mm. What is the magnification of the micrograph?

Options :

1. ✖ $2500\times$
2. ✖ $5000\times$
3. ✔ $7500\times$
4. ✖ $15000\times$

Question Number : 86 Question Id : 1051313326 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following statements is incorrect?

Options :

1. ✖ In substitutional solid solutions, impurity atoms replace host atoms in the lattice
2. ✔ Dislocations are zero-dimensional crystalline defects
3. ✖ Microscopy is used for observing microstructure using suitable microscopes
4. ✖ The intercept method is used to measure grain size in a material

Question Number : 87 Question Id : 1051313327 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

What happens in a eutectoid reaction on cooling?

Options :

1. ✖ Liquid transforms into two solids
2. ✔ One solid transforms into two different solids
3. ✖ Two solids combine to form one solid

4. ✖ Liquid transforms into one solid

Question Number : 88 Question Id : 1051313328 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match the following:

List-1		List-2	
A	Austenite	I	Soft and ductile BCC phase of iron
B	Ferrite	II	High-temperature FCC phase of iron
C	Cementite	III	Mixture of ferrite and cementite in layered form
D	Pearlite	IV	Iron carbide with fixed composition (Fe_3C)

Choose the correct option

Options :

1. ✖ A-I, B-III, C-IV, D-II

2. ✔ A-II, B-I, C-IV, D-III

3. ✖ A-IV, B-I, C-II, D-III

4. ✖ A-III, B-II, C-I, D-IV

Question Number : 89 Question Id : 1051313329 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Compared to homogeneous nucleation, the activation free energy required for heterogeneous nucleation is

Options :

1. ✔ Lower

2. ✖ Same

3. ✖ Higher

4. ✖

Independent of temperature

Question Number : 90 Question Id : 1051313330 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The equation that describes how the extent of phase transformation changes with time is known as

Options :

1. ✖ Arrhenius equation
2. ✖ Gibbs phase rule
3. ✖ Clausius–Clapeyron equation
4. ✔ Avrami equation

Question Number : 91 Question Id : 1051313331 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which sequence correctly orders steel microstructures from highest to lowest hardness?

Options :

1. ✖ Fine pearlite, Martensite, Bainite, Spheroidite
2. ✔ Martensite, Tempered martensite, Bainite, Spheroidite
3. ✖ Bainite, Martensite, Fine pearlite, Spheroidite
4. ✖ Tempered martensite, Fine pearlite, Martensite, Spheroidite

Question Number : 92 Question Id : 1051313332 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

An engineer needs a material for springs with minimal permanent deformation under load. Which property - alloy combination best satisfies this requirement?

Options :

1. ✖ High ductility – electrolytic copper
2. ✔ High yield strength – beryllium copper
3. ✖ Moderate strength – cartridge brass
4. ✖ Low elongation – leaded brass

Question Number : 93 Question Id : 1051313333 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The true strain (ϵ) and engineering strain (e) are related by

Options :

1. ✖ $\epsilon = \ln(e)$
2. ✖ $e = \ln(\epsilon)$
3. ✔ $\epsilon = \ln(1+e)$
4. ✖ $e = \ln(1+\epsilon)$

Question Number : 94 Question Id : 1051313334 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Consider the following

Assertion (A): Jominy end-quench test is not suitable for evaluating maximum hardness of steel.

Reason (R): The Jominy end-quench test measures hardness variation along the length of a standard specimen

Choose the correct answer

Options :

1. ✖ Both A and R are true, and R is the correct explanation of A
2. ✔ Both A and R are true, but R is not the correct explanation of A

- 3. ✖ A is true, but R is false
- 4. ✖ A is false, but R is true

Question Number : 95 Question Id : 1051313335 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following correctly represents the increasing order of modulus of elasticity for the given materials?

Options :

- 1. ✖ Zirconia < Soda-lime glass < Aluminium oxide
- 2. ✖ Aluminium oxide < Zirconia < Soda-lime glass
- 3. ✖ Soda-lime glass < Aluminium oxide < Zirconia
- 4. ✔ Soda-lime glass < Zirconia < Aluminium oxide

Question Number : 96 Question Id : 1051313336 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The hardening process normally used for the hardening of machine tool guideways is

Options :

- 1. ✔ Martempering
- 2. ✖ Flame hardening
- 3. ✖ Austempering
- 4. ✖ Induction hardening

Question Number : 97 Question Id : 1051313337 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match the following

Refractory Material		Major Composition/Oxide	
A	Fireclay	I	ZrSiO_4
B	Silica	II	MgO
C	Periclase	III	SiO_2
D	Zircon	IV	$\text{Al}_2\text{O}_3 + \text{SiO}_2$

Choose the correct option

Options :

1. ✖ A-I, B-II, C-III, D-IV
2. ✖ A-II, B-III, C-IV, D-I
3. ✔ A-IV, B-III, C-II, D-I
4. ✖ A-III, B-IV, C-I, D-II

Question Number : 98 Question Id : 1051313338 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following represents the correct decreasing order of their electrical conductivity?

Options :

1. ✔ Silver > Gold > Aluminium > Platinum
2. ✖ Silver > Aluminium > Gold > Platinum
3. ✖ Gold > Silver > Aluminium > Platinum
4. ✖ Silver > Gold > Platinum > Aluminium

Question Number : 99 Question Id : 1051313339 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following materials are having high thermal conductivity?

- I. Silver
- II. Gold
- III. Nickel
- IV. Brass

Options :

- 1. ✓ I and II only
- 2. ✗ I and III only
- 3. ✗ II and IV only
- 4. ✗ III and IV only

Question Number : 100 Question Id : 1051313340 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is soft magnetic material?

Options :

- 1. ✗ Alnico
- 2. ✗ Cunife
- 3. ✗ Tungsten steel
- 4. ✓ Superalloy

Question Number : 101 Question Id : 1051313341 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Complete the analogy

Avoids mould sticking : Parting sand :: Improves surface finish : _____

Options :

- 1. ✗ Backing sand

2. ✓ Facing sand
3. ✗ System sand
4. ✗ Core sand

Question Number : 102 Question Id : 1051313342 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match the following

Process		Description	
A	Centrifugal casting	I	Pattern is made of foam
B	Full mould casting	II	Wax pattern is used
C	Investment casting	III	Hollow parts made without core
D	Die casting	IV	Molten metal forced into metal mould

Choose the correct option

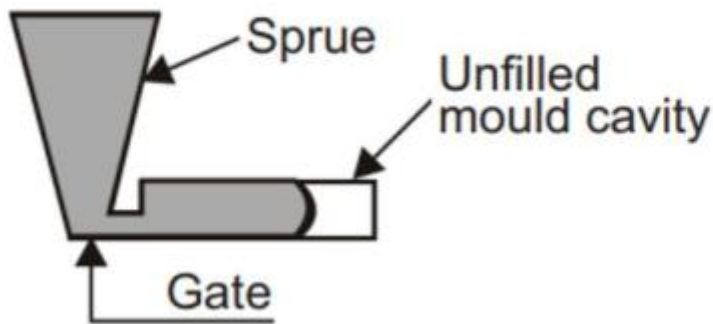
Options :

1. ✗ A-I, B-II, C-III, D-IV
2. ✗ A-II, B-III, C-IV, D-I
3. ✓ A-III, B-I, C-II, D-IV
4. ✗ A-I, B-IV, C-II, D-III

Question Number : 103 Question Id : 1051313343 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the casting defect shown in the given figure



Options :

- 1. ✖ Porosity
- 2. ✖ Hot Tears
- 3. ✖ Swell
- 4. ✔ Misrun

Question Number : 104 Question Id : 1051313344 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Liquid contraction during solidification of a casting will be taken care by

Options :

- 1. ✖ Runner
- 2. ✖ Sprue
- 3. ✔ Riser
- 4. ✖ Gate

Question Number : 105 Question Id : 1051313345 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Consider the following

Assertion (A): In SAW, the welding arc is not visible during welding.

Reason (R): The arc is completely submerged under a layer of granular flux.

Choose the correct answer

Options :

1. ✓ Both A and R are true, and R is the correct explanation of A
2. ✗ Both A and R are true, but R is not the correct explanation of A
3. ✗ A is true, but R is false
4. ✗ A is false, but R is true

Question Number : 106 Question Id : 1051313346 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Consider the following statements

Statement-I: In TIG welding, electrode consumption contributes to metal deposition

Statement-II: MIG welding is preferred for automation due to continuous wire feeding

Statement-III: MMAW electrodes require controlled storage conditions

The correct answer is

Options :

1. ✗ Statement-I and Statement-II are true
2. ✓ Statement-II and Statement-III are true
3. ✗ Statement-I and Statement-III are true
4. ✗ Statement-I, Statement-II and Statement-III are true

Question Number : 107 Question Id : 1051313347 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In the AWS electrode classification E6013, the number “60” indicates

Options :

1. ✖ Type of coating
2. ✖ Welding position
3. ✔ Minimum tensile strength of weld metal
4. ✖ Polarity of welding current

Question Number : 108 Question Id : 1051313348 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following pairs is correctly matched?

Options :

1. ✖ Drawing – Direct compression
2. ✖ Forging – Tension type
3. ✔ Blanking – Shearing
4. ✖ Bending – Indirect compression

Question Number : 109 Question Id : 1051313349 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which method permits point-by-point calculation of stress but is limited to plane-strain conditions only?

Options :

1. ✔ Slip-line field theory
2. ✖ Uniform-deformation energy method
3. ✖ Slab method
4. ✖ Finite element methods

Question Number : 110 Question Id : 1051313350 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Tomlinson and Stringer defined the coefficient of spread S in cogging as the ratio of

Options :

1. ✖ Increase in length to decrease in width
2. ✔ Increase in width to reduction in height
3. ✖ Reduction in height to increase in length
4. ✖ Reduction in width to increase in height

Question Number : 111 Question Id : 1051313351 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Temper rolling improves all of the following except

Options :

1. ✖ Surface quality
2. ✖ Flatness
3. ✖ Yield-point elongation behaviour
4. ✔ Grain size refinement

Question Number : 112 Question Id : 1051313352 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The term merchant mill refers to a rolling mill designed to roll

Options :

1. ✖ Plates
2. ✖ Sheets

3. ✓ Bars

4. ✗ Foils

Question Number : 113 Question Id : 1051313353 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Impact extrusion is a process used to produce

Options :

1. ✗ Long solid bars

2. ✓ Short lengths of hollow shapes

3. ✗ Thin flat sheets

4. ✗ Large solid billets

Question Number : 114 Question Id : 1051313354 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

As per the Ugine-Sejournet process, the lubricant most commonly used for high-temperature extrusion is

Options :

1. ✓ Molten glass

2. ✗ Oil

3. ✗ Soap solution

4. ✗ Solid wax

Question Number : 115 Question Id : 1051313355 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In the production sequence of pipe or tubing, a rolling mill is used to remove

Options :

1. ✖ Surface cracks
2. ✖ Scale formation
3. ✔ Slight oval shape
4. ✖ Residual stresses

Question Number : 116 Question Id : 1051313356 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In the Hoeganaes process, which statement is not correct?

Options :

1. ✖ Limestone acts as a flux and limits sulphur contamination
2. ✔ Mill scale is the raw material used
3. ✖ The final reduction stage occurs in a hydrogen atmosphere
4. ✖ Treatment is carried out in silicon carbide containers

Question Number : 117 Question Id : 1051313357 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The following steps are involved in unidirectional die compaction in powder metallurgy, but they are jumbled

- I. Removal of load by retracting the punch
- II. Ejection of the green compact
- III. Charging the powder mix
- IV. Applying load using a punch to compact the powders

Choose the correct sequence

Options :

1. ✓ III, IV, I, II
2. ✗ III, I, IV, II
3. ✗ IV, III, I, II
4. ✗ IV, I, III, II

Question Number : 118 Question Id : 1051313358 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statements regarding liquid phase sintering is/are correct?

Statement-I: An appreciable amount of liquid phase must be present

Statement-II: There must be appreciable solubility of the solid in the liquid

Statement-III: Complete wetting of the solid by the liquid is required

The correct answer is

Options :

1. ✗ Statement-I only
2. ✗ Statement-I and Statement-II only
3. ✗ Statement-II and Statement-III only
4. ✓ Statement-I, Statement-II and Statement-III

Question Number : 119 Question Id : 1051313359 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The method which is related to pressure less powder shaping method is

Options :

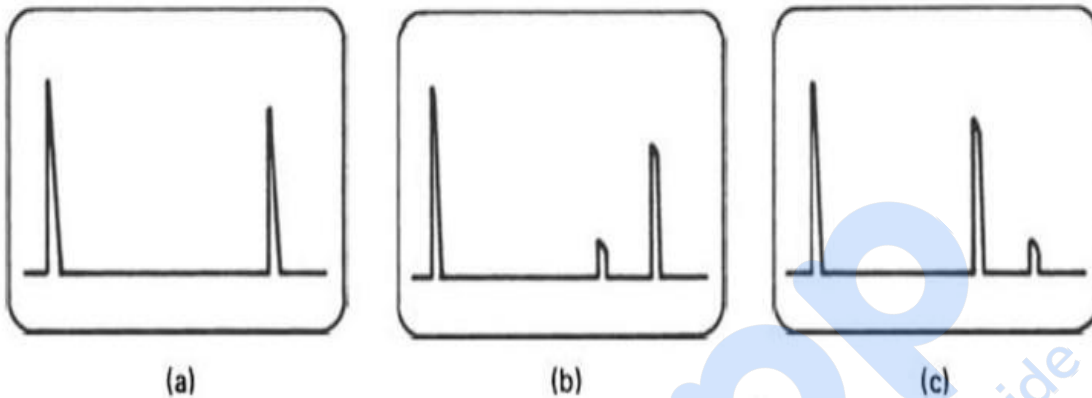
1. ✗ Powder extrusion
2. ✓ Injection moulding
3. ✗ Slurry moulding

4. ✖ Wet compaction

Question Number : 120 Question Id : 1051313360 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statement is correct based on the ultrasonic testing screen display as shown in the figure?



Options :

1. ✖ Increase in defect size increases the backwall echo height
2. ✖ Defect-free material shows both defect echo and backwall echo
3. ✔ A large defect produces a large defect echo and a small backwall echo
4. ✖ A small defect completely eliminates the backwall echo