TSPSC
PL

Previous Year Paper
(Metallurgy)
06 Sept, 2023 Shift 2

TCSiON CAE

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 :	PC222015METALLURGYPL2220 06th September 2023 Shift 2
Subject Name :	PC222015 METALLURGY PL2220
Actual Answer Key :	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 type :	Online
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 1 Question Id : 630680350289 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The occurrence of large chunks of mineral concentrations in the crustal part of the Earth are called _____.

Options :

1. ✖ Gangue

2. ✖ Sample

3. ✔ Ore Deposits

4. ✖ Tenor

Question Number : 2 Question Id : 630680350290 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which metal is extracted from the mineral haematite?

Options :

1. ✖ Gold

2. ✔ Iron

3. ✖ Copper

4. ✖ Aluminium

Question Number : 3 Question Id : 630680350291 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which process involves the pretreatment of ores using mainly physical properties and avoids significant chemical changes in the ore?

Options :

1. ✖ Electrolysis

2. ✖ Fusion

3. ✖ Photosynthesis

4. ✔ Concentration of ore

Question Number : 4 Question Id : 630680350292 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In Hydrometallurgy, what is the term for the process where a metal is obtained as a soluble salt, while the gangue particles are left behind?

Options :

1. ✖ Smelting

2. ✔ Leaching

3. ✖ Roasting

4. ✖ Refining

Question Number : 5 Question Id : 630680350293 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

By which metallurgical process can metal be extracted through the electrolysis of their salts while in a molten state?

Options :

1. ✖ Pyrometallurgy

2. ✖ Hydrometallurgy

3. ✔ Electrometallurgy

4. ✖ Bio-hydrometallurgy

Question Number : 6 Question Id : 630680350294 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding Pyrometallurgy?

I. It is the process of extracting the metals using high temperature.

II. The different steps involved in pyrometallurgy are calcination, roasting and smelting.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 7 Question Id : 630680350295 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding Ore Geology?

I. Gangue is a commercially unwanted material that exists in close association with the ore mineral.

II. In ore reserve context, the sample represents a small portion of an ore deposit which acts as a typical representative of a certain part of the deposit.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 8 Question Id : 630680350296 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding the Ore Dressing or Beneficiation of Ores?

I. Gravity Separation method is based on the difference in the specific gravities of the ore and gangue.

II. Magnetic Separation method is based on the difference in magnetic properties of minerals.

III. Froth Flotation method is based on the difference in wettability of different minerals.

Options :

1. ✖ Only I and II

2. ✖ Only I and III

3. ✖ Only II and III

4. ✔ I, II and III

Question Number : 9 Question Id : 630680350297 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following metallurgical process with its suitable application.

	Metallurgical Process		Application
I	Pyrometallurgy	1	Extracting metals from low-grade ores.
II	Hydrometallurgy	2	Producing reactive metals like sodium and lithium from their compounds.
III	Electrometallurgy	3	Extracting metals using high temperature.

Options :

1. ✔ I-3, II-1, III-2

2. ✖ I-1, II-3, III-2

3. ✖ I-2, II-1, III-3

4. ✖ I-3, II-2, III-1

Question Number : 10 Question Id : 630680350298 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following are correctly matched pair used in Smelting process?

I. Flux- In smelting, a suitable chemical substance called flux is added.

II. Slag- The flux reacts with the gangue that remains after concentration to form a low melting compound called slag.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 11 Question Id : 630680350299 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following steps of Pyrometallurgical process from the first step to the last step.

I. Smelting

II. Roasting

III. Refining

Options :

1. ✔ II, I, III

2. ✖ II, III, I

3. ✖ III, I, II

4. ✖ I, III, II

Question Number : 12 Question Id : 630680350300 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following Gravitational Separation processes for concentration of the ore from the first step to the last step.

I. The crushed ore is kept on top of a sloping table, which is made to vibrate.

II. The lighter particles are thrown up by vibration and are removed by the water stream. The heavier mineral particles settle to the bottom and are collected.

III. A stream of water is passed in the direction perpendicular to the slope.

Options :

1. ✔ I, III, II

2. ✖ II, I, III

3. ✖ II, III, I

4. ✖ I, II, III

Question Number : 13 Question Id : 630680350301 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the purpose of tempering in the heat treatment of steel?

Options :

1. ✖ To increase the hardness of the steel.

2. ✖ To improve the machinability of the steel.

3. ✖ To increase internal stresses within the steel.

4. ✔ To enhance the toughness and ductility of the steel.

Question Number : 14 Question Id : 630680350302 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the Age Hardening?

Options :

1. ✖ Adding impurities to the metal matrix.

2. ✖ Increasing the grain size of the metal.

3. ✖ Heating the metal after cooling.

4. ✔ A heat-treating process for nonferrous alloys.

Question Number : 15 Question Id : 630680350303 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of these types of alloys are used in aircraft turbine components, which must withstand exposure to severely oxidizing environments and high temperatures for reasonable time periods?

Options :

1. ✖ Aluminum Alloys

2. ✖ Magnesium Alloys

3. ✖ Titanium Alloys

4. ✔ Super Alloys

Question Number : 16 Question Id : 630680350304 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What does the iron-carbon diagram primarily illustrate?

Options :

1. ✖ Mechanical properties of metals

2. ✖ Corrosion behavior of iron

3. ✔ Phase transformation in iron-carbon alloys

4. ✖ Electric conductivity of metals

Question Number : 17 Question Id : 630680350305 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is Crystallization?

Options :

1. ✖ Transition from the solid to the liquid state.

2. ✔ Transition from the liquid to the solid state.

3. ✖ Transition from the liquid to the gas state.

4. ✖ Transition from the gas to the solid state.

Question Number : 18 Question Id : 630680350306 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the key characteristic of shape memory alloys?

Options :

1. ✖ High electrical conductivity.

2. ✔ Ability to return to their predeformed shapes upon heating.

3. ✖ Resistance to corrosion

4. ✖ Low melting point

Question Number : 19 Question Id : 630680350307 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding Phase Diagrams?

I. Phase diagrams are usually plotted with temperature, as the ordinate.

II. Phase diagrams are usually plotted with alloy composition, as the abscissa.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 20 Question Id : 630680350308 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding Crystal Structure?

I. The unit cell of the b.c.c. structure contains 2 atoms.

II. The unit cell of the f.c.c. structure contains 3 atoms.

Options :

1.

✔ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 21 Question Id : 630680350309 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding the heat treatment process?

I. Stress-relief annealing process is useful in removing residual stresses due to heavy machining formation.

II. Process annealing process is used in the sheet and wire industries and is carried out by heating the steel to a temperature below the lower critical line (1000 to 1250°F).

III. The purpose of normalizing is to produce a lighter steel than full annealing.

Options :

1. ✖ Only I

2. ✔ Only I and II

3. ✖ Only II and III

4. ✖ Only I and III

Question Number : 22 Question Id : 630680350310 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding the case hardening process?

I. Carburizing, Nitriding and Cyaniding change the chemical composition of steel.

II. Flame hardening and Induction hardening do not change the chemical composition of the steel.

III. Induction hardening is a non-shallow hardening process.

Options :

1. ✖ Only I

2. ✔ Only I and II

3. ✖ Only II and III

4. ✖ Only I and III

Question Number : 23 Question Id : 630680350311 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following phase change of iron with its respective temperature change during the cooling of pure iron.

	Temperature change		Phase change of iron
I	Above 2800°F	1	Γ (gama) iron f.c.c.
II	2800 to 2554°F	2	Liquid state
III	2554 to 1666°F	3	δ (delta) iron b.c.c.

Options :

1. ✔ I-2, II-3, III-1

2. ✖ I-1, II-3, III-2

3. ✖ I-2, II-1, III-3

4. ✖ I-3, II-2, III-1

Question Number : 24 Question Id : 630680350312 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following are correctly matched pair regarding the case hardening of steel?

I. Carburizing – The usual temperature is 1700°F

II. Nitriding – The usual temperature held between 925 and 1050°F

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 25 Question Id : 630680350313 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following Common Commercial Glasses based on their Silica (silicon dioxide) content in increasing order.

I. Soda-lime

II. Pyrex

III. Fiberglass

Options :

1. ✔ III, I, II

2. ✖ II, I, III

3. ✖ I, II, III

4. ✖ II, III, I

Question Number : 26 Question Id : 630680350314 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following annealing processes from first step to the last step.

I. Cooling, usually to room temperature.

II. 'Holding' or "soaking" at that temperature.

III. Heating to the desired temperature.

Options :

1. ✔ III, II, I

2. ✖ II, I, III

3. ✖ II, III, I

4. ✖ I, III, II

Question Number : 27 Question Id : 630680350315 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

When an irreversible process occurs, the total entropy of the universe _____.

Options :

1. ✖ decreases

2. ✔ increases

3. ✖ remain same

4. ✖ does not depend upon the process

Question Number : 28 Question Id : 630680350316 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

If δq is the infinitesimal thermal energy transferred into the system at temperature T, then the entropy (S) is defined by the equation _____.

Options :

1. ✖ $dS' = \frac{\delta q}{2T}$

2. ✖ $dS' = \frac{2\delta q}{T}$

3. ✖

$dS' = \frac{3\delta q}{T}$

4. ✔ $dS' = \frac{\delta q}{T}$

Question Number : 29 Question Id : 630680350317 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The Boltzman equation provides a helpful qualitative understanding of _____.

Options :

1. ✖ Enthalpy

2. ✖ Internal Energy

3. ✔ Entropy

4. ✖ Temperature

Question Number : 30 Question Id : 630680350318 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In a closed system at constant pressure and temperature, the Gibbs free energy _____ at equilibrium.

Options :

1. ✖ decreases

2. ✖ increases

3. ✔ is minimum

4. ✖ is maximum

Question Number : 31 Question Id : 630680350319 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

If Q_i is the partial molar value of the extensive thermodynamic function Q of the solution component i, then the Gibbs – Duhem relationship is _____.

Options :

1. ✖ $\sum_i X_i \overline{dQ_i} = 1$

2. ✖ $\sum_i X_i \overline{dQ_i} = -1$

3. ✖ $\sum_i X_i \overline{dQ_i} = \frac{1}{2}$

4. ✔ $\sum_i X_i \overline{dQ_i} = 0$

Question Number : 32 Question Id : 630680350320 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding enthalpy (H)?

I. For any internal energy U, Pressure P and Volume V;

$$H = U - PV$$

II. Enthalpy (H) is a state property.

Options :

1. ✖ Only I

2. ✔ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 33 Question Id : 630680350321 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding various systems used in thermodynamics?

I. A system having one phase is called heterogenous system.

II. A system having two phase is called homogenous system.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✔ Neither I nor II

Question Number : 34 Question Id : 630680350322 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding first law of thermodynamics?

I. It is based on law of conservation of energy.

II. It brought in the concept of internal energy.

III. For an infinitesimal (i.e. differential) process, the statement is $du = \delta q + \delta w$.

Options :

1. ✖ Only I

2. ✔ Only I and II

3. ✖ Only II and III

4. ✖ Only I and III

Question Number : 35 Question Id : 630680350323 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following reversible process paths with their effects based on first law of thermodynamics.

	Process Path		Effect
I	At constant volume	1	$\Delta u = q$
II	At constant pressure	2	$w = q$
III	At constant temperature	3	$w = P(V_2 - V_1)$

Options :

1. ✔ I-1, II-3, III-2

2. ✖ I-3, II-2, III-1

3. ✖ I-2, II-3, III-1

4. ✖ I-3, II-1, III-2

Question Number : 36 Question Id : 630680350324 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following steps of change in internal energy to summarize the first law of thermodynamics (from first to last).

I. Body moves to the state B.

II. Body initially in the state A, performs work 'w' and absorbs energy 'q' via a thermal gradient.

III. The absorption of 'q' increases the internal energy and work 'w' decreases body's internal energy.

IV. The total change in the internal energy of the body, $\Delta U' = q - w$

Options :

1. ✔ II, I, III, IV

2. ✖ I, III, IV, II

3. ✖ III, I, II, IV

4. ✖ II, IV, III, I

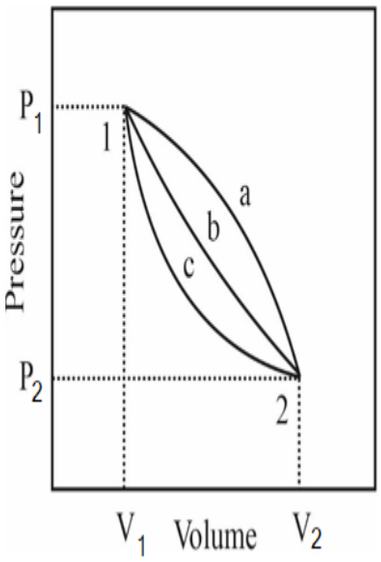
Question Number : 37 Question Id : 630680350325 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The given figure shows the work performed by the gas through the three processes (a, b, and c) from state 1 to state 2.

Arrange the process (a, b, and c) in the increasing order of their work done. (i.e. less work done to more work done).



Options :

1. ✔ Process c < process b < process a

2. ✖ Process a < process b < process c

3. ✖ Process b < process a < process c

4. ✖ Process c < process a < process b

Question Number : 38 Question Id : 630680350326 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The Griffith's equation shows a strong dependence of fracture strength on _____.

Options :

1. ✖ Crack depth

2. ✔ Crack length

3. ✖ Crack breadth

4. ✖ Crack density

Question Number : 39 Question Id : 630680350327 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The engineering tension test is widely used to provide basic design information on the _____.

Options :

1. ✖ Viscosity

2. ✖ Resistance to corrosion

3. ✖ Thermal conductivity

4. ✔ Strength of materials

Question Number : 40 Question Id : 630680350328 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Fatigue failure in materials occurs due to _____.

Options :

1. ✖ Chemical corrosion

2. ✖ Sudden impact loading

3. ✖ Overheating

4. ✔ Repetitive cyclic loading

Question Number : 41 Question Id : 630680350329 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What does the S-N curve represent in materials testing?

Options :

1. ✖ Ductility

2. ✔ Fatigue Strength

3. ✖ Creep Resistance

4. ✖ Elastic deformation behaviour

Question Number : 42 Question Id : 630680350330 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The progressive deformation of a material at constant stress is called _____.

Options :

1. ✖ Toughness

2. ✖ Ductility

3. ✔ Creep

4. ✖ Hardness

Question Number : 43 Question Id : 630680350331 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is 'slip' in the context of crystal structures?

Options :

1. ✖ The result of twinning in a crystal.

2. ✔ The movement of dislocations along specific crystal planes.

3. ✖ A type of fracture that occurs in brittle materials.

4. ✖ A process of crystal growth at high temperatures.

Question Number : 44 Question Id : 630680350332 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding the classification of Fractures?

I. An appreciable amount of gross deformation is usually present at the fracture surfaces in ductile fracture.

II. Brittle fracture is to be avoided at all cost, because it occurs without warning and usually produces disastrous consequences.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 45 Question Id : 630680350333 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding Griffith's theory of brittle fracture?

I. Griffith's theory in its original form is applicable only to a perfectly brittle material such as glass.

II. Griffith established that a crack will propagate when the decrease in elastic strain energy is at least equal to the energy required to create the new crack surface.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 46 Question Id : 630680350334 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding the Ductile fracture?

I. Ductile fracture is a much more serious problem than brittle fracture.

II. Ductile fracture occurs by a slow tearing of the metal with the expenditure of considerable energy.

III. Much ductile metals may actually draw down to a line or a point before separation. This kind of failure is usually called rupture.

Options :

1. ✖ Only I

2. ✖ Only I and II

3. ✔ Only II and III

4. ✖ Only I and III

Question Number : 47 Question Id : 630680350335 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following are correctly matched pair regarding the general shape of the engineering stress-strain curve of a metal?

I. Within elastic limit - Stress is linearly proportional to strain.

II. When the load exceeds the yield strength- The specimen undergoes gross plastic deformation.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 48 Question Id : 630680350336 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following temperature conditions that result in fatigue strength in increasing order i.e., from the temperature condition showing lower fatigue strength to temperature condition showing higher fatigue strength.

I. Lower temperature than room temperature

II. Room temperature

III. Higher temperature than room temperature

Options :

1. ✔ III, II, I

2. ✖ II, I, III

3. ✖ III, I, II

4. ✖ II, III, I

Question Number : 49 Question Id : 630680350337 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following steps chronologically in the mechanism of ductile fracture in a pearlitic steel. (from first step to the last step)

I. Carbides that are parallel to the applied tensile stress crack first.

II. A concentrated shear zone at about 50° to the tensile axis causes cracking of adjacent carbide plates.

III. The voids grow and coalesce to form the ductile fracture.

Options :

1. ✖ III, I, II

2. ✔ I, II, III

3. ✖ II, III, I

4. ✖ I, III, II

Question Number : 50 Question Id : 630680350338 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the another term for "direct reduced iron" (DRI)?

Options :

1. ✖ Pig Iron

2. ✔ Sponge Iron

3. ✖ Wrought Iron

4. ✖ Cast Iron

Question Number : 51 Question Id : 630680350339 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is "Simple deoxidation" in the context of steelmaking?

Options :

1. ✖ Skipping the deoxidation step

2. ✖ Adding two deoxidisers

3. ✔ Adding a single deoxidiser

4. ✖ Adding multiple deoxidisers (more than two)

Question Number : 52 Question Id : 630680350340 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In a blast furnace, where does the combustion zone primarily occur?

Options :

1. ✖ Bustle pipe

2. ✔ Tuyere

3. ✖ Bosh

4. ✖ Hearth

Question Number : 53 Question Id : 630680350341 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the typical size fraction of lump ore used in a blast furnace?

Options :

1. ✖ 1-5 mm

2. ✖ 5-10 mm

3. ✔ 10-30 mm

4. ✖ 30-50 mm

Question Number : 54 Question Id : 630680350342 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the main purpose of the sintering process in ironmaking?

Options :

1. ✖ Refining liquid iron directly

2. ✖ Refining impurities in iron ore

3. ✖ Purifying raw materials for steel production

4. ✔ Agglomerating fine iron ore particles

Question Number : 55 Question Id : 630680350343 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding direct reduction in the blast furnace?

I. Direct reduction improves the chemical utilisation of carbon.

II. Since direct reduction is strongly endothermic, it lowers the thermal efficiency.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 56 Question Id : 630680350344 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding slag properties?

I. High alumina slags have high viscosity, which hampers desulphurisation.

II. In high alumina slags, the only course of action that is often left is to add MgO, in order to reduce the slag viscosity.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 57 Question Id : 630680350345 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding the Smelting Reduction Process?

I. It is the alternative means of producing hot metal.

II. The reductant of this process is coal plus oxygen and/or electricity.

III. The oxide feed of this process is ore fines, lump ores, waste iron oxides.

Options :

1. ✖ Only I and III

2. ✖ Only I and II

3. ✖ Only II and III

4. ✔ I, II, and III

Question Number : 58 Question Id : 630680350346 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following operational difficulties of blast furnace with their reasons.

	Operational Difficulties		Reasons
I	Hot Spots	1	Due to an initial wedging or bridging of the stack in the furnace.
II	Scaffolding	2	Due to local failure of the lining.
III	Slipping	3	Due to irregularities in the working of the furnace, such as low fuel ratio.

Options :

1. ✔ I-2, II-3, III-1

2. ✖ I-1, II-3, III-2

3. ✖ I-1, II-2, III-3

4. ✖ I-3, II-2, III-1

Question Number : 59 Question Id : 630680350347 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following are correctly matched pair regarding Constructional Features of the Blast Furnace?

I. Belly- The cylindrical portion below the stack.

II. Bosh- Below the belly and sloping inwards going downwards.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 60 Question Id : 630680350348 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following blast furnace slags in increasing order of their presence.

I. MgO

II. SiO_2

III. CaO

Options :

1. ✖ III, I, II

2. ✖ II, I, III

3. ✔ I, II, III

4. ✖ II, III, I

Question Number : 61 Question Id : 630680350349 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following 'blowing in' process of a blast furnace from first step to the last step.

I. Lighting

II. Operating until routine production

III. Drying

IV. Filling

Options :

1. ✔ III, IV, I, II

2. ✖ II, I, III, IV

3. ✖ II, III, I, IV

4. ✖ IV, III, II, I

Question Number : 62 Question Id : 630680350350 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

During the matte smelting of copper, what is included in the furnace charge to promote matte slag immiscibility and maintain high furnace temperatures?

Options :

1. ✖ Charcoal

2. ✔ SiO_2 flux

3. ✖ Limestone

4. ✖ Sodium chloride

Question Number : 63 Question Id : 630680350351 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the term for the resulting molten copper that is sent to refining during the copper converting process?

Options :

1. ✖ Copper oxide

2. ✖ Impure copper

3. ✔ Blister copper

4. ✖ Crystalline copper

Question Number : 64 Question Id : 630680350352 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following process is used in the hydrometallurgical extraction of copper?

Options :

1. ✖ Filtration

2. ✔ Electrowinning

3. ✖ Smelting

4. ✖ Distillation

Question Number : 65 Question Id : 630680350353 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the primary purpose of fire refining in the copper extraction process?

Options :

1. ✖ Production of copper alloys.

2. ✖ Extraction of gold from copper ore.

3. ✖ Formation of copper oxide.

4. ✔ Removal of sulfur and oxygen impurities from copper.

Question Number : 66 Question Id : 630680350354 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which process is commonly used for the production of magnesium?

Options :

1. ✖ Bessemer process

2. ✖ Hall-Heroult process

3. ✔ Pidgeon process

4. ✖ Ostwald process

Question Number : 67 Question Id : 630680350355 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding electrolytic refining?

I. It is the refining or purification of metals through the process of electrolysis.

II. In this process, a water soluble salt solution of the metal to be purified taken as electrolyte.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 68 Question Id : 630680350356 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding the Copper Converting process?

I. Copper converting is an oxidation of the molten matte from smelting with air or oxygen-enriched air.

II. It removes Fe and S from the matte to produce crude (99% Cu) molten copper.

III. Crude molten copper is sent to the fire- and electro refining.

Options :

1. ✖ Only I and III

2.

✖ Only I and II

3. ✖ Only II and III

4. ✔ I, II, and III

Question Number : 69 Question Id : 630680350357 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following processes with the metals it produce.

	Process		Metals
I	Kroll's Process	1	Magnesium
II	Hall-Heroult Process	2	Titanium
III	Pidgeon Process	3	Aluminium

Options :

1. ✖ I-3, II-1, III-2

2. ✔ I-2, II-3, III-1

3. ✖ I-2, II-1, III-3

4. ✖ I-3, II-2, III-1

Question Number : 70 Question Id : 630680350358 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is correctly matched pair regarding the electrolytic refining?

I. An anode of impure metal- Connected to the positive terminal of the battery.

II. A cathode of pure metal- Connected to the negative terminal of the battery.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 71 Question Id : 630680350359 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following steps in the chronological order regarding the extraction of copper process. (From first to last).

I. Converting

II. Matte Smelting

III. Concentration by Froth Flotation

IV. Fire Refining and Electrorefining

Options :

1. ✔ III, II, I, IV

2. ✖ II, III, IV, I

3. ✖ I, II, IV, III

4. ✖ I, IV, III, II

Question Number : 72 Question Id : 630680350360 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following steps in the chronological order (from first step to the last step) for the production of magnesium chloride from seawater.

I. The acid reacts with the hydroxide, forming magnesium chloride.

II. Hydrochloric acid is added.

III. Precipitation of magnesium hydroxide.

Options :

1. ✔ III, II, I

2. ✖ II, I, III

3. ✖ II, III, I

4. ✖ I, III, II

Question Number : 73 Question Id : 630680350361 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

For most metals that are stressed in tension, what is the relationship between stress and strain?

Options :

1. ✖ Stress = 2 × (Young's modulus × Strain)

2. ✖ $\text{Stress} = \frac{1}{2} \times (\text{Young's modulus} \times \text{Strain})$

3. ✖ $\text{Stress} = \frac{1}{3} \times (\text{Young's modulus} \times \text{Strain})$

4. ✔ $\text{Stress} = \text{Young's modulus} \times \text{Strain}$

Question Number : 74 Question Id : 630680350362 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which type of deformation is non-permanent?

Options :

1. ✔ Elastic deformation

2. ✖ Brittle deformation

3. ✖ Plastic deformation

4. ✖ Ductile deformation

Question Number : 75 Question Id : 630680350363 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In Forging, metal and alloys are deformed to the specified shapes by the application of _____.

Options :

1. ✖ Oxyacetylene gas

2. ✖ Metallic arc

3. ✖ Laser beam

4. ✔ Repeated blows from a hammer

Question Number : 76 Question Id : 630680350364 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In forging operations, Scale Pits defects are seen sometimes, this is caused due to _____.

Options :

1. ✖ improper heating

2. ✖ very rapid plastic flow of metal

3. ✔ squeezing of scales into the metal surface during hammering action

4. ✖ improperly aligned die halves

Question Number : 77 Question Id : 630680350365 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which type of mill consists of two working rolls of small diameter and four or more backing rolls?

Options :

1. ✖ Two high mills

2. ✖ Three high mills

3. ✖ Four high mills

4. ✔ Cluster mills

Question Number : 78 Question Id : 630680350366 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

_____ is the process in which the metal is enclosed in a closed chamber and the only opening provided is through a die.

Options :

1. ✖ Rolling

2. ✖ Forging

3. ✔ Extrusion

4. ✖ Welding

Question Number : 79 Question Id : 630680350367 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding Tensile Test?

I. It is a mechanical stress–strain test.

II. This test is destructive; since the test specimen is permanently deformed and usually fractured.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 80 Question Id : 630680350368 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding units used in stress and strain?

I. The unit of stress is megapascals (MPa).

II. The unit of strain is meter (m).

Options :

1. ✔ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 81 Question Id : 630680350369 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding the nomenclature of rolled products?

I. Blooms are the last product obtained from the breakdown of Ingots.

II. Billet is the next product rolled from a bloom.

III. Foil is a very thin sheet.

Options :

1. ✖ Only I

2. ✖ Only I and II

3. ✔ Only II and III

4. ✖ Only I and III

Question Number : 82 Question Id : 630680350370 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following forming processes with the stress employed in the material.

	Stress		Process
I	Mainly compression type	1	Drawing
II	Mainly tension type	2	Deep drawing
III	Combined tension and compression type	3	Forging

Options :

1. ✔ I-3, II-1, III-2

2. ✖ I-1, II-3, III-2

3. ✖ I-2, II-1, III-3

4. ✖ I-3, II-2, III-1

Question Number : 83 Question Id : 630680350371 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following are correctly matched pair regarding the basic forging operations?

I. Upsetting- It is the process of decreasing the cross-section.

II. Drawing down- In this process, length is increased and the cross-sectional area is reduced.

Options :

1. ✖ Only I

2. ✔ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 84 Question Id : 630680350372 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following Forward Extrusion processes from first step to the last step.

I. The block of material is pressed from behind by means of a ram and a follower pad.

II. The heated material is forced to squeeze through the die-opening in the form of a long strip of the required cross-section.

III. Material is heated and transferred inside a chamber.

Options :

1. ✔ III, I, II

2. ✖ II, I, III

3. ✖ II, III, I

4. ✖ III, II, I

Question Number : 85 Question Id : 630680350373 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following Punching process from first step to the last step.

I. The job is heated.

II. The job is then turned upside down and punch is forced in from the other side.

III. Job is kept on the anvil and a punch of suitable size is forced to about half the depth of the job by hammering.

Options :

1. ✔ I, III, II

2. ✖ II, I, III

3. ✖ II, III, I

4. ✖ III, II, I

Question Number : 86 Question Id : 630680350374 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The main operations of the powder metal process are _____.

Options :

1. ✖ Casting

2. ✖ Welding

3. ✖ Drawing

4. ✔ Compacting and Sintering

Question Number : 87 Question Id : 630680350375 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the main purpose of compaction in powder metallurgy?

Options :

1. ✖ To remove material density

2. ✖ To increase the conductivity

3. ✔ To consolidate the powder into the desired shape

4. ✖ To improve surface finish

Question Number : 88 Question Id : 630680350376 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Sintering process is usually carried out at a temperature _____ the highest melting constituent.

Options :

1. ✖ slightly above

2. ✔ below

3. ✖ same as

4. ✖ far above

Question Number : 89 Question Id : 630680350377 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the critical requirement for the protective atmosphere used in sintering?

Options :

1. ✖ Presence of nitrogen gas

2. ✖ High oxygen concentration

3. ✔ Should not contain any free oxygen

4. ✖ Helium for rapid heating

Question Number : 90 Question Id : 630680350378 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In solid bodies, what action tends to decrease the sintering forces between particles during the sintering process?

Options :

1. ✖ Increasing pressure

2. ✖ Decreasing particle size

3. ✖ Decreasing temperature

4. ✔ Increasing temperature

Question Number : 91 Question Id : 630680350379 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Powder metallurgy is commonly used in the production of which type of components?

Options :

1. ✖ Plastic parts

2. ✔ Metal components

3. ✖ Thin films for electronics

4. ✖ Wooden parts

Question Number : 92 Question Id : 630680350380 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding Sintering?

I. Sintering is an operation in which the green briquettes are subjected to heat, usually in an inert atmosphere.

II. Electric furnace is the most suitable for this work.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 93 Question Id : 630680350381 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding Powder Metallurgy?

I. It is the art of producing metal powders and using them to make serviceable objects.

II. High strength, ductility, and toughness may be obtained by powder metallurgy parts.

III. After the development of powder metallurgy, the old idea of brittle fragile parts is still in use.

Options :

1. ✖ Only I

2. ✔ Only I and II

3. ✖ Only II and III

4. ✖ Only I and III

Question Number : 94 Question Id : 630680350382 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following compaction-type with their specification.

	Compaction-type		**Specification**
I	Continuous compaction	1	Used for ceramics but only to a limited extent for metals.
II	Slip casting	2	The die is filled with loose powder which is then sintered in the die.
III	Gravity compaction	3	Applied primarily for simple shapes such as rod, sheet, tube and plate.

Options :

1. ✔ I-3, II-1, III-2

2. ✖ I-1, II-3, III-2

3. ✖ I-2, II-1, III-3

4. ✖ I-3, II-2, III-1

Question Number : 95 Question Id : 630680350383 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following sequence of operations in die compacting in the chronological order (i.e. from first to the last).

I. Apply the required pressure by movement of upper and lower punches toward each other.

II. Fill the die cavity with a definite volume of powder.

III. Eject the green compact by the lower punch.

Options :

1. ✖ I, III, II

2. ✔ II, I, III

3. ✖ II, III, I

4. ✖ III, II, I

Question Number : 96 Question Id : 630680350384 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Ceramics are generally regarded as _____.

Options :

1. ✖ Ductile, Non-brittle materials

2. ✔ Brittle, Non-ductile materials

3. ✖ Malleable materials

4. ✖ Flexible materials

Question Number : 97 Question Id : 630680350385 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What makes ceramics particularly attractive for structures in which weight reduction is a prime consideration?

Options :

1. ✖ Their metallic bonding

2. ✖ Their low melting point

3. ✔ Their low density with high stiffness

4. ✖ Their high density with low stiffness

Question Number : 98 Question Id : 630680350386 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What are the common additives used in window glass manufacturing?

Options :

1. ✖ CuO

2. ✔ Na_2O and CaO

3. ✖ Fe_2O_3

4. ✖ Fe_3O_4

Question Number : 99 Question Id : 630680350387 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Aircraft windscreen glasses typically made of _____.

Options :

1. ✖ Polycarbonate

2. ✖ Acrylic plastic

3. ✖ Tempered glass

4. ✔ Laminated glass

Question Number : 100 Question Id : 630680350388 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the common name for the glass-reinforced polymer (GRP) material?

Options :

1. ✖ Acrylic

2. ✖ Plexiglass

3. ✔ Fibreglass

4. ✖ Polycarbonate

Question Number : 101 Question Id : 630680350389 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

For Metal Matrix Composites (MMCs), the ratio of longitudinal strength to transverse strength can be _____.

Options :

1. ✖ 9 : 1

2. ✖ 11 : 1

3. ✖ 13 : 1

4. ✔ 15 : 1 or more

Question Number : 102 Question Id : 630680350390 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What are Ceramic Matrix Composites (CMCs)?

Options :

1. ✖ Materials made by combining ceramics and polymers.

2. ✖ Materials made entirely of metal.

3. ✔ Reinforcement of cements and concretes with short filaments of glass, steel or carbon.

4. ✖ Materials consisting of only organic compounds.

Question Number : 103 Question Id : 630680350391 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding Ceramic Strength?

I. The strength of ceramics under compressive stress is excellent.

II. The tensile strength of ceramics is not exceptional.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 104 Question Id : 630680350392 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding the properties of Glasses?

I. Viscosity is a prime property of glass.

II. Most glasses produced are based upon silica.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 105 Question Id : 630680350393 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding the Polymer-matrix composites?

I. Polymer-matrix composites belong to fibre-reinforced composite.

II. Glass-reinforced polymers (GRP) is a type of Polymer-matrix composites.

III. A typical fabrication procedure for a GRP is to add a mixture of polyester resin, curing agent and catalyst to fibres of low- alkali S-glass.

Options :

1. ✖ Only I

2. ✔ Only I and II

3. ✖ Only II and III

4. ✖ Only I and III

Question Number : 106 Question Id : 630680350394 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following ceramics with their chemical compounds.

	Ceramics		Compounds
I	Alumina	1	Silicates
II	Boron Nitride	2	Oxides
III	Porcelain	3	Carbides

Options :

1. ✔ I-2, II-3, III-1

2. ✖ I-1, II-3, III-2

3. ✖ I-2, II-1, III-3

4. ✖ I-3, II-2, III-1

Question Number : 107 Question Id : 630680350395 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is correctly matched pair regarding the different types of Glasses?

I. Pyrex Glass- It is referred to as a 'soda-lime' glass.

II. Window Glass- It is referred to as a 'borosilicate' glass.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✔ Neither I nor II

Question Number : 108 Question Id : 630680350396 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In a Gas Welding process, if oxygen supply is less than required, then the flame is termed as _____.

Options :

1. ✖ Submerged Flame

2. ✖ Neutral Flame

3. ✖ Oxidising Flame

4. ✔ Reducing Flame

Question Number : 109 Question Id : 630680350397 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In Arc Welding, the temperatures reached in an electric arc may be as high as _____.

Options :

1. ✖ 2000°C

2. ✖ 3000°C

3. ✖ 4000°C

4. ✔ 5500°C

Question Number : 110 Question Id : 630680350398 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the most difficult welding position for a welder?

Options :

1. ✖ Downhand welding position

2. ✖ Horizontal welding position

3. ✖ Vertical welding position

4. ✔ Overhead welding position

Question Number : 111 Question Id : 630680350399 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A Seam Welding process is a subtype of _____.

Options :

1. ✖ Gas Welding

2. ✖ Laser Beam Welding

3. ✔ Electric Resistance Welding

4. ✖ Friction Welding

Question Number : 112 Question Id : 630680350400 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the heat-affected zone (HAZ) in welding?

Options :

1. ✖ The area where the welding material is the strongest.

2. ✖ The area that remains unaffected by the welding process.

3. ✔ The area affected by welding.

4. ✖ The welding defected area.

Question Number : 113 Question Id : 630680350401 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What cause porosity or blow holes in the weld bed?

Options :

1. ✖ Slag inclusion

2. ✔ Entrapped gases

3. ✖ Undercut

4. ✖ Due to inadequate ductility

Question Number : 114 Question Id : 630680350402 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding Casting Defects?

I. Blow-holes are always open to surface, not below the surface of the casting.

II. Shrinkage cavity is totally internal.

Options :

1. ✖ Only I

2. ✔ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 115 Question Id : 630680350403 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding Gas Welding Systems?

I. In high pressure system, both oxygen and acetylene gases are drawn from cylinders.

II. In low pressure system, oxygen gas is drawn from a cylinder, but acetylene gas is produced at site at low pressure.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 116 Question Id : 630680350404 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding the various types of patterns in casting process?

I. In single piece pattern, there is a provision for runners and risers.

II. For the complicated shapes, split pattern can be used.

III. For small projections or overhanging portions, loose piece pattern can be used.

Options :

1. ✖ Only I

2. ✖ Only I and II

3. ✔ Only II and III

4. ✖ Only I and III

Question Number : 117 Question Id : 630680350405 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is correctly matched pair regarding the moulding sand properties?

I. Refractoriness- It should be able to with stand high temperatures.

II. Permeability- Ability to allow gases, water vapour and air to pass through it.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 118 Question Id : 630680350406 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following steps of manufacturing process of patterns from first step to the last step.

I. Molten metal is poured into this cavity and allowed to solidify and cool down to room temperature.

II. The pattern is then withdrawn from inside the sand mould.

III. The mould is prepared in wet sand, to which some binder is added to hold sand particles together.

Options :

1. ✔ III, II, I

2. ✖ II, I, III

3. ✖ II, III, I

4. ✖ I, III, II

Question Number : 119 Question Id : 630680350407 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is an electric based furnace?

Options :

1. ✖ Boiler house furnace

2. ✖ Cupola furnace

3. ✔ Electric arc furnace

4. ✖ Blast furnace

Question Number : 120 Question Id : 630680350408 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the use of "dog house" in an electric arc furnace?

Options :

1. ✖ Controlling furnace temperature

2. ✔ A enclosure to avoid pollutants like dust, fume, heat, etc.

3. ✖ Storing raw materials

4. ✖ Extracting molten metal

Question Number : 121 Question Id : 630680350409 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the primary purpose of an Induction Furnace?

Options :

1. ✖ Generating electricity

2. ✖ Casting molds

3. ✖ Roasting sulphide ore

4. ✔ Steel melting

Question Number : 122 Question Id : 630680350410 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

For which purpose Reverberatory Furnace commonly used?

Options :

1. ✔ Copper smelting

2. ✖ Water purification

3. ✖ Baking bread

4. ✖ Glass blowing

Question Number : 123 Question Id : 630680350411 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the main characteristic of a vertical shaft furnace?

Options :

1. ✖ Material moves up under gravity.

2. ✔ The material fed from top moves down under gravity requires less effort.

3. ✖ Material is fed horizontally from the side.

4. ✖ Material is melted using microwave energy.

Question Number : 124 Question Id : 630680350412 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the approximate temperature needed in Induction Furnace?

Options :

1. ✖ 200-300 °C

2. ✖ 600-700 °C

3. ✔ 1500-1600 °C

4. ✖ 2500-3000 °C

Question Number : 125 Question Id : 630680350413 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding Electric arc furnace applications?

I. The electric arc furnaces are useful at lower capacities (5–50 ton) with regular production.

II. The electric arc furnace is used in steel making.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 126 Question Id : 630680350414 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding induction furnace?

I. The furnace shape of an induction furnace is Crucible type.

II. The induction furnace requires AC supply.

III. When the induction furnace is used on smaller scale, the current frequency in the range of 1000–10000 Hz is needed.

Options :

1. ✖ Only I and III

2.

✖ Only I and II

3. ✖ Only II and III

4. ✔ I, II and III

Question Number : 127 Question Id : 630680350415 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following are correctly matched pair regarding the Electric Arc Furnace components?

I. Mechanical Components - Electrode moving motors.

II. Electrical Components - Metal tapping spout or Slide gate.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✔ Neither I nor II

Question Number : 128 Question Id : 630680350416 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In Magnetic Particle Testing, to inspect cylindrical objects (I= current in ampere, D= external diameter (in mm)), the current required for magnetization is given by _____.

Options :

1. ✖ I = 10 D

2. ✔ I = 20 D

3. ✖ I = 30 D

4. ✖ I = 40 D

Question Number : 129 Question Id : 630680350417 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Ultrasonic testing involves the use of _____.

Options :

1. ✖ Visible light

2. ✔ Sound waves

3. ✖ Magnetic fields

4. ✖ Electric currents

Question Number : 130 Question Id : 630680350418 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In which of the following testing a couplant is used to reduce the air gap between the transducer and the surface of the part to be inspected?

Options :

1. ✖ Eddy current testing

2. ✖ Magnetic particle testing

3. ✔ Ultrasonic testing

4. ✖ Radiographic testing

Question Number : 131 Question Id : 630680350419 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In ultrasonic flaw detecting, most testing is carried out frequencies between _____.

Options :

1. ✖ 1,000 and 10,000 cycles per second

2. ✖ 10,000 and 1,00,000 cycles per second

3. ✖ 1,00,000 and 5,00,000 cycles per second

4. ✔ 5,00,000 and 1,00,00,000 cycles per second

Question Number : 132 Question Id : 630680350420 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In which of the following non-destructive testing X-rays or gamma rays are used?

Options :

1. ✖ Ultrasonic Testing

2. ✖ Eddy Current Testing

3. ✖ Magnetic Particle Testing

4. ✔ Radiographic Testing

Question Number : 133 Question Id : 630680350421 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding Eddy Current testing?

I. Eddy current testing is one of the electromagnetic non-destructive methods.

II. This is complementary to ultrasonic testing for detecting defects close to the surface.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 134 Question Id : 630680350422 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding Visual Methods in non destructive testing?

I. Direct visual testing is carried out with naked eye.

II. Aided visual testing is carried out with the aid of optical aids.

III. Borescopes are the optical aid used in practice for visual testing.

Options :

1. ✖ Only I and III

2. ✖ Only I and II

3. ✖ Only II and III

4. ✔ I , II and III

Question Number : 135 Question Id : 630680350423 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding Magnetic Particle Testing?

I. This testing locates surface and subsurface discontinuities in parts made by ferromagnetic materials.

II. This testing is governed by the laws of magnetism.

III. This method can be used if a thick paint coating is present.

Options :

1. ✖ Only I and III

2. ✔ Only I and II

3. ✖ Only II and III

4. ✖ Only III

Question Number : 136 Question Id : 630680350424 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following Eddy Current Testing instruments with their applications.

	Instruments		**Applications**
I	Oscillator	1	To eliminate unwanted frequencies from the receiver signal.
II	Test Coil	2	Provides an alternating current of the required frequency to the test.
III	Filters	3	Serves as the main link between the test instrument and test subject.

Options :

1. ✔ I-2, II-3, III-1

2. ✖ I-1, II-3, III-2

3. ✖ I-2, II-1, III-3

4. ✖ I-3, II-2, III-1

Question Number : 137 Question Id : 630680350425 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is correctly matched pair regarding the Ultrasonic Testing methods?

I. Transmission method - One ultrasonic transducer is used.

II. Pulse-echo method - Two ultrasonic transducers are used.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✔ Neither I nor II

Question Number : 138 Question Id : 630680350426 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following parts of an X-ray tube from left to the right.

I. Target

II. Anode

III. Cathode

Options :

1. ✖ III, II, I

2. ✔ III, I, II

3. ✖ II, III, I

4. ✖ I, III, II

Question Number : 139 Question Id : 630680350427 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following steps of Penetrate Flow Detection process from first step to the last step.

I. Dwell time

II. Development

III. Clean and dry surface

IV. Inspection

V. Application of penetrant

Options :

1. ✔ III, V, I, II, IV

2. ✖ II, I, III, IV, V

3. ✖ II, III, I, V, IV

4. ✖ I, III, II, IV, V

Question Number : 140 Question Id : 630680350428 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Nickel-based super alloys are mainly used for _____.

Options :

1. ✖ Protection against rust

2.

✖ Keeping things cold

3. ✖ Holding things up

4. ✔ Handling high temperatures

Question Number : 141 Question Id : 630680350429 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which characteristic is particularly important when selecting materials for super alloys?

Options :

1. ✖ Color diversity

2. ✖ Transparency

3. ✔ Resistance to creep deformation

4. ✖ Electrical conductivity

Question Number : 142 Question Id : 630680350430 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What structure does the gamma phase (γ) typically show in the microstructure of a super alloy?

Options :

1. ✖ BCC structure

2. ✔ FCC structure

3. ✖ HCP structure

4. ✖ Amorphous structure

Question Number : 143 Question Id : 630680350431 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which application commonly utilizes Vacuum Induction Melting for the production of materials?

Options :

1. ✖ Jewellery making

2. ✖ Glass manufacturing

3. ✔ Turbine disc alloys

4. ✖ Plastic molding

Question Number : 144 Question Id : 630680350432 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The current used in Vacuum Arc Remelting method is typically _____.

Options :

1. ✖ ~100 A

2. ✖ ~1000 A

3. ✔ ~10000 A

4. ✖ ~100000 A

Question Number : 145 Question Id : 630680350433 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

During Vacuum Arc Remelting process, the energy necessary for melting is provided by _____.

Options :

1. ✖ Solar radiation

2. ✖ Microwave energy

3. ✖ AC current

4. ✔ DC arc

Question Number : 146 Question Id : 630680350434 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding Vacuum Arc Remelting method?

I. Vacuum Arc Remelting process is used for the production of turbine disc alloys.

II. Vacuum Arc Remelting method involves the melting under vacuum of a consumable electrode into a copper-cooled crucible.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 147 Question Id : 630680350435 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding super alloys?

I. Super alloys are used in gas turbine engines.

II. Super alloys display excellent resistance to mechanical degradation.

III. Super alloys display excellent resistance to chemical degradation as well.

Options :

1. ✖ Only I and III

2. ✖ Only I and II

3. ✖ Only II and III

4. ✔ I, II and III

Question Number : 148 Question Id : 630680350436 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following phases (found in the microstructure of a typical super alloy) with their specifications.

	Phases		Specifications
I	The gamma phase (γ)	1	Preferred in nickel–iron super alloys and those rich in niobium.
II	The gamma prime precipitate phase (γ ')	2	Contains significant concentrations of elements such as cobalt, chromium, molybdenum.
III	The gamma double prime phase (γ")	3	Rich in elements such as aluminium, titanium and tantalum.

Options :

1. ✔ I-2, II-3, III-1

2. ✖ I-1, II-3, III-2

3. ✖ I-2, II-1, III-3

4. ✖ I-3, II-2, III-1

Question Number : 149 Question Id : 630680350437 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following superalloy elements in the increasing order of their melting temperatures.

I. Cobalt

II. Iron

III. Nickel

Options :

1. ✔ III, I, II

2. ✖ III, II, I

3. ✖ II, III, I

4. ✖ I, III, II

Question Number : 150 Question Id : 630680350438 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following process in the correct chronological order for the production of turbine disc alloys (from first to the last).

I. Electro-slag refining

II. Vacuum arc remelting

III. Vacuum induction melting

Options :

1. ✔ III, I, II

2. ✖ II, I, III

3. ✖ I, III, II

4. ✖ III, II, I