

Andhra Pradesh State Council of Higher Education

Notations :

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

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

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

Metallurgy

Section Id :	33300855
Section Number :	1
Mandatory or Optional :	Mandatory
Number of Questions :	120
Section Marks :	120
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 1 Question Id : 3330086481 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following does not have FCC crystal structure?

Options :

1. ✖ Copper

2. ✔ Sodium

3. ✖ Lead

4.

✖ Aluminium

Question Number : 2 Question Id : 3330086482 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Froth flotation is most suitable for treating

Options :

1. ✖ Iron ores
2. ✖ Quartzite
3. ✔ Sulphide ores
4. ✖ Carbonates

Question Number : 3 Question Id : 3330086483 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a line defect found in metal crystal?

Options :

1. ✖ Vacancies
2. ✖ Grain boundaries

3. ✖ Stacking faults

4. ✔ Dislocations

Question Number : 4 Question Id : 3330086484 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Softest phase in Fe-Fe₃C phase diagram is

Options :

1. ✖ Austenite

2. ✖ Cementite

3. ✔ α ferrite

4. ✖ Martensite

Question Number : 5 Question Id : 3330086485 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

At room temperature, Iron is _____ in lattice arrangement

Options :

1. ✖ HCP

2. ✓ BCC

3. ✗ Tetragonal

4. ✗ FCC

Question Number : 6 Question Id : 3330086486 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The term Ledeburite in steels refer to

Options :

1. ✗ An inter metallic compound

2. ✗ A solid solution

3. ✗ An inclusion

4. ✓ A mixture of two phases

Question Number : 7 Question Id : 3330086487 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The eutectoid reaction in steel occurs at

Options :

1. ✓ 723°C

2. ✗ 1146°C

3. ✗ 1495°C

4. ✗ 910°C

Question Number : 8 Question Id : 3330086488 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Peritectic reaction among the following is

Options :

1. ✓ $\alpha + \text{L} \xrightarrow{\text{Cooling}} \beta$

2. ✗ $\text{L} \xrightarrow{\text{Cooling}} \beta$

3. ✗ $\alpha \xrightarrow{\text{Cooling}} \beta$

4. ✗ $\text{L} \xrightarrow{\text{Cooling}} \beta + \text{S}$

Question Number : 9 Question Id : 3330086489 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Carbon content in hypo eutectic cast iron is

Options :

1. ✖ 0.08-0.8%

2. ✖ 4.3-6.67%

3. ✔ 2.0-4.3%

4. ✖ 0.8-2.0%

Question Number : 10 Question Id : 3330086490 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Etching solution used for Copper is

Options :

1. ✖ Nital

2. ✔ 50% NH_4OH

3. ✖ Picral

4. ✖ 1% HF in water

Question Number : 11 Question Id : 3330086491 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Toughness of a material implies

Options :

1. ✔ Impact strength

2. ✖ Creep resistance

3. ✖ Stress relieving

4. ✖ Machinability

Question Number : 12 Question Id : 3330086492 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Martensite transformation occurs by

Options :

Nucleation-and-growth phenomenon

1. ✖

2. ✓ Diffusionless transformation

3. ✗ Lattice diffusion

4. ✗ Spinodal decomposition

Question Number : 13 Question Id : 3330086493 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The fine austenite grain size in steel increases

Options :

1. ✗ Corrosion resistance

2. ✗ Hardenability

3. ✗ Creep strength

4. ✓ Impact toughness

Question Number : 14 Question Id : 3330086494 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which mode of size reduction is used by Jaw crushers?

Options :

1. ✖ Impact
2. ✔ Compression
3. ✖ Cutting
4. ✖ Attrition

Question Number : 15 Question Id : 3330086495 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a metal refining process?

Options :

1. ✖ Roasting
2. ✖ Smelting
3. ✔ Vacuum arc remelting
4. ✖ Calcination

Question Number : 16 Question Id : 3330086496 Display Question Number : Yes Is Question

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

Kick's law relates to

Options :

1. ✖ Final particle size
2. ✖ feed size
3. ✖ Ore size
4. ✔ Energy consumption

Question Number : 17 Question Id : 3330086497 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Pine oil used in froth flotation technique to acts as a

Options :

1. ✔ Frother
2. ✖ Collector
3. ✖ Crusher
4. ✖ Modifier

Question Number : 18 Question Id : 3330086498 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Leaching of ore is done in _____ method of metal extraction process

Options :

1. ✖ Smelting
2. ✖ Pyro metallurgical
3. ✔ Hydro metallurgical
4. ✖ Electro metallurgical

Question Number : 19 Question Id : 3330086499 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not a function of coke in the blast furnace?

Options :

1. ✖ Produce heat
2. ✖ Generate reducing gases
3. ✖ Act as spacer

4. ✓ Act as a Flux

Question Number : 20 Question Id : 3330086500 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The size of blast furnace coke is about

Options :

1. ✗ 10-30 mm

2. ✓ 25-80 mm

3. ✗ 80- 100 mm

4. ✗ 25-40 mm

Question Number : 21 Question Id : 3330086501 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is an acidic refractory?

Options :

1. ✗ Magnesite

2. ✗ Dolomite

3. ✓ Fireclay

4. ✗ Chrome magnesite

Question Number : 22 Question Id : 3330086502 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is the hardest structure that appears on Fe-C equilibrium diagram?

Options :

1. ✗ Ferrite

2. ✗ Pearlite

3. ✗ Austenite

4. ✓ Cementite

Question Number : 23 Question Id : 3330086503 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following statement is wrong in Hume Rothery rules?

Options :

1. ✗ Solute and solvent atoms possess almost equal diameters

2. ✖ The crystal structure of two metals is same
3. ✔ The chemical affinity of the two metals is high
4. ✖ Lower chemical valance metals will dissolve more in higher valance than vice versa

Question Number : 24 Question Id : 3330086504 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Segar cones are used for the determination of

Options :

1. ✖ Electrical conductivity
2. ✔ Softening temperature of refractories
3. ✖ Spalling resistance
4. ✖ Resistance to slag attack

Question Number : 25 Question Id : 3330086505 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Sillimanite is a

Options :

1. ✖ Basic refractory
2. ✖ Insulating refractory
3. ✖ Neutral refractory
4. ✔ High alumina refractory

Question Number : 26 Question Id : 3330086506 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The structure produced by martempering of steel is _____

Options :

1. ✖ Pearlite
2. ✖ Austenite
3. ✔ Martensite
4. ✖ Bainite

Question Number : 27 Question Id : 3330086507 Display Question Number : Yes Is Question

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

Which of the following treatment is used for imparting ductility in the metals?

Options :

1. ✓ Annealing
2. ✗ Normalizing
3. ✗ Hardening
4. ✗ Tempering

Question Number : 28 Question Id : 3330086508 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Sub-zero treatment is used for

Options :

1. ✗ Bainite transformation
2. ✗ Pearlite transformation
3. ✗ Austenite transformation
4. ✓ Retained Austenite transformation

Question Number : 29 Question Id : 3330086509 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Hardenability of a Steel is measured in terms of

Options :

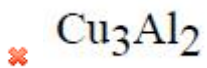
1. ✖ Its Iron content
2. ✖ Its carbon content
3. ✔ The depth martensite from the surface
4. ✖ The depth of Austenite from the surface

Question Number : 30 Question Id : 3330086510 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Compound formed during precipitation hardening of Al-Cu alloys is

Options :

1. ✖ CuAl
2. ✔ CuAl₂
3. ✖ Cu₂Al₃
4. ✖



Question Number : 31 Question Id : 3330086511 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The structure produced by Austempering of steel is

Options :

1. ✖ Austenite

2. ✖ Pearlite

3. ✔ Bainite

4. ✖ Martensite

Question Number : 32 Question Id : 3330086512 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Sorbite is a mixture

Options :

1. ✔ Ferrite and cementite

2. ✖ Austenite and Ferrite

3. ✖ Ferrite and pearlite

4. ✖ Ferrite and martenisite

Question Number : 33 Question Id : 3330086513 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Major alloying addition in spring steels is

Options :

1. ✖ Aluminium

2. ✔ Silicon

3. ✖ Titanium

4. ✖ Nickel

Question Number : 34 Question Id : 3330086514 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not a mixture of ferrite and cementite?

Options :

1. ✖ Troostite

- 2. ✖ Pearlite
- 3. ✖ Ledeburite
- 4. ✔ Martensite

Question Number : 35 Question Id : 3330086515 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Malleable cast irons is obtained by controlled heat treatment of -----

Options :

- 1. ✖ Grey cast iron
- 2. ✖ Nodular cast iron
- 3. ✔ White cast iron
- 4. ✖ Flake graphite cast iron

Question Number : 36 Question Id : 3330086516 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The diffusion inequality of components in a binary solution of alloys is given by

Options :

1. ✖ Cottrell effect
2. ✖ Graham's law
3. ✖ Fick's law
4. ✔ Kirkendall effect

Question Number : 37 Question Id : 3330086517 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Stress causing a deformation of _____% is called yield strength

Options :

1. ✖ 1.0
2. ✖ 0.01
3. ✔ 0.2
4. ✖ 3.3

Question Number : 38 Question Id : 3330086518 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The diameter of ball in BHN test for steel and other hard materials is

Options :

- 1. ✖ 5 mm
- 2. ✔ 10 mm
- 3. ✖ 25 mm
- 4. ✖ 50 mm

Question Number : 39 Question Id : 3330086519 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In which of the following hardness test Brale indenter is used for indentation?

Options :

- 1. ✖ Vickers test
- 2. ✖ Shore test
- 3. ✖ Brinell test
- 4. ✔ Rockwell test

Question Number : 40 Question Id : 3330086520 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ability of a material to withstand suddenly applied loads is called

Options :

1. ✖ Creep strength
2. ✖ Hardness
3. ✔ Impact strength
4. ✖ Fatigue strength

Question Number : 41 Question Id : 3330086521 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The fatigue limit of metals is decreased by

Options :

1. ✖ Carburizing
2. ✖ Nitriding
3. ✖ Carbonitriding
4. ✔ Decarburizing

Question Number : 42 Question Id : 3330086522 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Plastic deformation of metal below its recrystallization temperature is called

Options :

1. ✓ Cold working
2. ✗ Hot working
3. ✗ Deep drawing
4. ✗ Tempering

Question Number : 43 Question Id : 3330086523 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

At what temperature grains and grain boundaries will have equal strength?

Options :

1. ✗ Recrystallization temperature
2. ✗ Curie temperature
3. ✗ Absolute zero temperaure
4. ✓ Equi cohesive temperature

Question Number : 44 Question Id : 3330086524 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which method is not used to measure the Residual stress of a given materials ?

Options :

1. ✖ Magnetic particle method
2. ✖ Radiography
3. ✔ Dye-penetrant method
4. ✖ Ultrasonic testing

Question Number : 45 Question Id : 3330086525 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not used for manufacture of bearing materials?

Options :

1. ✖ Steel
2. ✖ Copper
3. ✖ Babbitt materials

4. ✓ Pig iron

Question Number : 46 Question Id : 3330086526 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Hooke's law holds good up to

Options :

1. ✗ Plastic limit

2. ✓ Proportional limit

3. ✗ Yield point

4. ✗ Ultimate tensile strength

Question Number : 47 Question Id : 3330086527 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In CO_2 moulding process _____ is used as binder

Options :

1. ✗ Water

2. ✗ Dextrine

3. ✓ Sodium silicate

4. ✗ Bentonite

Question Number : 48 Question Id : 3330086528 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a powder production method?

Options :

1. ✗ Rolling

2. ✗ Tapping

3. ✗ Forging

4. ✓ Atomization

Question Number : 49 Question Id : 3330086529 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Copper materials exhibit _____ fracture

Options :

1. ✗ Flat

2. ✖ Combined

3. ✔ Cup and cone

4. ✖ Helical

Question Number : 50 Question Id : 3330086530 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a ore of Titanium?

Options :

1. ✖ Bauxite

2. ✔ Ilmenite

3. ✖ Chacopyrite

4. ✖ Limonite

Question Number : 51 Question Id : 3330086531 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Cementite (Fe_3C) crystal structure is

Options :

1. ✔

Orthorhombic

2. ✖ BCT

3. ✖ HCP

4. ✖ FCC

Question Number : 52 Question Id : 3330086532 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Most closely packed planes in face-centered cubic lattice are

Options :

1. ✖ (1 1 0)

2. ✖ (1 1 2)

3. ✖ (1 0 0)

4. ✔ (1 1 1)

Question Number : 53 Question Id : 3330086533 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Stacking faults are _____ imperfections

Options :

1. ✖ Point
2. ✖ Line
3. ✔ Surface
4. ✖ Volume

Question Number : 54 Question Id : 3330086534 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following alloy can be strengthened by Age-hardening?

Options :

1. ✖ Cu - Sn
2. ✖ Cu – Zn
3. ✖ Cu – Ni
4. ✔ Al – Cu

Question Number : 55 Question Id : 3330086535 Display Question Number : Yes Is Question

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

Surgical instruments are made of

Options :

- 1. ✖ Plain carbon steels
- 2. ✖ Titanium alloys
- 3. ✔ Stainless steels
- 4. ✖ Copper alloys

Question Number : 56 Question Id : 3330086536 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Razor blades are made with _____% of carbon steel

Options :

- 1. ✖ Low carbon steel
- 2. ✖ Medium carbon steel
- 3. ✖ Mild steel
- 4. ✔ High carbon steel

Question Number : 57 Question Id : 3330086537 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Zirconium alloys are used in nuclear reactors as _____

Options :

1. ✓ Cladding material
2. ✗ Catalyst
3. ✗ Moderator
4. ✗ Fuel

Question Number : 58 Question Id : 3330086538 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

To obtain high corrosion resistance of the steel which of the following elements are added

Options :

1. ✗ Carbon, Silicon
2. ✓ Chromium, Nickel
3. ✗ Carbon, Tungsten

4. ✖ Copper, Titanium

Question Number : 59 Question Id : 3330086539 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Dephosphorization is favourable in following conditions of steel making process

Options :

- 1. ✖ Acid slag and oxidizing atmosphere
- 2. ✖ Acid slag and reducing atmosphere
- 3. ✔ Basic slag and oxidizing atmosphere
- 4. ✖ Basic slag and reducing atmosphere

Question Number : 60 Question Id : 3330086540 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Finest particles in blast furnace gas is removed by

Options :

- 1. ✖ Dust catcher
- 2. ✔ Electrostatic precipitator

3. ✖ Wet scrubber

4. ✖ Blast furnace stoves

Question Number : 61 Question Id : 3330086541 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not an iron ore ?

Options :

1. ✖ Banded Hematite Quartzite (BHQ)

2. ✖ Hematite

3. ✖ Goethite

4. ✔ Chalcopyrite

Question Number : 62 Question Id : 3330086542 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a chief source of sulphur entry in the blast furnace?

Options :

1. ✖ Iron ore

2. ✓ Coke

3. ✗ Sinter

4. ✗ Flux

Question Number : 63 Question Id : 3330086543 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The favourable conditions for desulphurization of iron

Options :

1. ✓ Both slag basicity and temperature should be high

2. ✗ Atmosphere should be oxidizing

3. ✗ Slag basicity should be low and temperature should be high

4. ✗ Slag should be viscous

Question Number : 64 Question Id : 3330086544 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Blue dust is

Options :

1. ✖ Generated during iron making
2. ✖ Generated during steel making
3. ✔ Generated during mining
4. ✖ Dust collected from exhaust gases

Question Number : 65 Question Id : 3330086545 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Iron ore sintering employs the principle of _____

Options :

1. ✔ Down draught sintering
2. ✖ Up draught sintering
3. ✖ Smelting
4. ✖ Roasting

Question Number : 66 Question Id : 3330086546 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

High alumina content in the blast furnace slag _____

Options :

1. ✖ Increases its melting point, but decreases its viscosity
2. ✖ Does not affect its melting point but increases its viscosity
3. ✖ Decreases both its melting point but increases its viscosity
4. ✔ Increases both its melting point and viscosity

Question Number : 67 Question Id : 3330086547 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Lever rule is used to evaluate the _____

Options :

1. ✔ Relative amounts of two phases in equilibrium at any specified temperature
2. ✖ Chemical composition of the phases of an alloy in equilibrium at any specified temperature
3. ✖ Residual stresses in a given alloy
4. ✖ Number of phases present in a given alloy

Question Number : 68 Question Id : 3330086548 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Catch carbon technique is employed in LD steel making process to produce

Options :

1. ✖ Low carbon steel
2. ✖ High alloy steel
3. ✔ High carbon steel
4. ✖ Killed steel

Question Number : 69 Question Id : 3330086549 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Composites strength is evaluated by -----

Options :

1. ✖ Hooke's law
2. ✖ Power law
3. ✖ Fick's law
4. ✔

✓ Rule of mixture

Question Number : 70 Question Id : 3330086550 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Salamander tapping in blast furnace is done after

Options :

1. ✓ Blowing out
2. ✗ Banking
3. ✗ Back draughting
4. ✗ Blowing in

Question Number : 71 Question Id : 3330086551 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a creep deformation mechanism?

Options :

1. ✗ Grain sliding
2. ✓ Grain boundary sliding

3. ✖ Dislocations pile up

4. ✖ Strain hardening

Question Number : 72 Question Id : 3330086552 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not a metal matrix composites fabrication technique

Options :

1. ✖ Vortex method

2. ✖ Squeeze casting

3. ✔ Pultrusion

4. ✖ Duralcan process

Question Number : 73 Question Id : 3330086553 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Critical fibre length of a composite is expressed by the following equation

Options :

1. ✔ $L_c = [\sigma \times d] / [2 \tau_c]$

2. ✖ $L_c = [\sigma + d] / [2 \tau_c]$

3. ✖ $L_c = [2 \tau_c] / [\sigma \times d]$

4. ✖ $L_c = [\sigma - d] / [2 \tau_c]$

Question Number : 74 Question Id : 3330086554 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following employs a bottom blowing operation?

Options :

1. ✖ L.D. converter

2. ✖ Rotor

3. ✔ OBM

4. ✖ Kaldo furnace

Question Number : 75 Question Id : 3330086555 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Basic steel making process ____slag is prepared to remove the impurities

Options :

1.

✖ Dry slag

2. ✔ Wet slag

3. ✖ Neutral slag

4. ✖ Reducing slag

Question Number : 76 Question Id : 3330086556 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Killing of the steel bath is aimed to remove _____

Options :

1. ✖ Carbon

2. ✖ Sulphur

3. ✖ Phosphorous

4. ✔ Oxygen

Question Number : 77 Question Id : 3330086557 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Glass ceramics possess _____

Options :

1. ✓ Fine grain structure
2. ✗ Non-crystalline structure
3. ✗ Hard and Brittle
4. ✗ Low impact strength

Question Number : 78 Question Id : 3330086558 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is an oxide ore of copper

Options :

1. ✗ Chalcocite
2. ✗ Chalcopyrite
3. ✓ Malachite
4. ✗ Bornite

Question Number : 79 Question Id : 3330086559 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

In Parkes process, desilverising of molten lead is affected by the addition of _____

Options :

1. ✖ Carbon
2. ✖ Copper
3. ✖ Aluminum
4. ✔ Zinc

Question Number : 80 Question Id : 3330086560 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The use of Bacterial leaching is _____

Options :

1. ✖ Refining of metals
2. ✖ Fast recovery of metal values
3. ✔ In situ-leaching low-grade ores
4. ✖ Leaching of enriched ores

Question Number : 81 Question Id : 3330086561 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Lead free solders are made with _____

Options :

1. ✖ Iron based alloys
2. ✔ Tin based alloys
3. ✖ Magnesium based alloys
4. ✖ Aluminium based alloys

Question Number : 82 Question Id : 3330086562 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is the most weldable of all metals?

Options :

1. ✔ Plain carbon steels
2. ✖ Stainless steels
3. ✖ Aluminium

4. ✖ Brass

Question Number : 83 Question Id : 3330086563 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The formation of corrosion retarding films on metal surfaces is known as

Options :

1. ✖ Polarization

2. ✔ Passivation

3. ✖ Cavitation

4. ✖ Pitting

Question Number : 84 Question Id : 3330086564 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Example of a sacrificial anode which is used in the protection of underground pipelines is

Options :

1. ✖ Steel

2. ✖ Platinum

3. ✖ Graphite

4. ✔ Magnesium

Question Number : 85 Question Id : 3330086565 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Enthalpy 'H' defined as

Options :

1. ✖ $H = E - PV$

2. ✔ $H = E + PV$

3. ✖ $H = F - TS$

4. ✖ $H = F + PV$

Question Number : 86 Question Id : 3330086566 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The main cause to exist congruent melting alloys in a given isomorphous system is

Options :

1. ✔ Large atomic size difference between solvent and solute

2. ✖ Variation in crystal structures of solvent and solute
3. ✖ Variation in chemical valance factor of solvent and solute
4. ✖ Variation in chemical composition of solvent and solute

Question Number : 87 Question Id : 3330086567 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Degrees of freedom at triple point will be

Options :

1. ✔ 0
2. ✖ 1
3. ✖ 2
4. ✖ 3

Question Number : 88 Question Id : 3330086568 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The free energy changes at equilibrium is _____

Options :

1. ✖ Positive
2. ✖ Negative
3. ✖ Intermediate
4. ✔ Zero

Question Number : 89 Question Id : 3330086569 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a spontaneous process _____

Options :

1. ✖ Both Free energy and entropy decreases
2. ✖ Free energy increases
3. ✔ Free energy decreases whereas the entropy increases
4. ✖ Free energy is zero

Question Number : 90 Question Id : 3330086570 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Entropy is a measure of

Options :

1. ✓ Disorder of a system
2. ✗ Orderly behaviour of a system
3. ✗ Only temperature changes of the system
4. ✗ Equilibrium of system

Question Number : 91 Question Id : 3330086571 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Ellingham diagrams for $M - MO_x$ reactions is a plot of _____

Options :

1. ✗ ΔG vs T
2. ✓ ΔG^0 vs T
3. ✗ ΔG vs $1/T$

4. ✖ ΔG^0 vs $1/T$

Question Number : 92 Question Id : 3330086572 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Ellingham diagrams _____ reaction that is parallel to the temperature axis

Options :

1. ✖ $2\text{CO} + \text{O}_2 = 2\text{CO}_2$

2. ✖ $2\text{C} + \text{O}_2 = 2\text{CO}$

3. ✔ $\text{C} + \text{O}_2 = \text{CO}_2$

4. ✖ $2\text{Zn} + \text{O}_2 = 2\text{ZnO}$

Question Number : 93 Question Id : 3330086573 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Dental alloys are casted by _____ process

Options :

1. ✖ True centrifugal

- 2. ✖ Shell moulding
- 3. ✖ CO₂ moulding process
- 4. ✔ Investment casting

Question Number : 94 Question Id : 3330086574 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ideal theoretical shape of a Riser is _____

Options :

- 1. ✖ Conical
- 2. ✖ Rectangular
- 3. ✔ Cylindrical
- 4. ✖ Cubic

Question Number : 95 Question Id : 3330086575 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Plastic goods are usually produced by

Options :

1. ✖ Shell moulding
2. ✔ Injection moulding
3. ✖ Wet sand moulding
4. ✖ Dry sand moulding

Question Number : 96 Question Id : 3330086576 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Blow holes are casting defects caused by_____

Options :

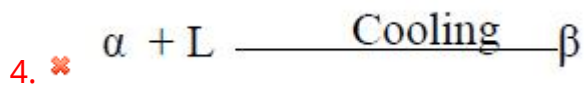
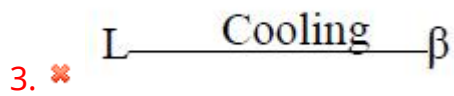
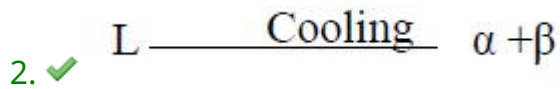
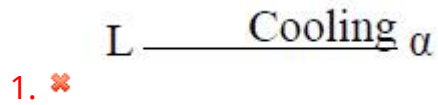
1. ✔ Excessive gaseous substances not able to escape
2. ✖ Discontinuity is metal casting resulting from hindered contraction
3. ✖ Two streams of metals that are too cold to figure properly
4. ✖ Some sand shearing from the cope surface

Question Number : 97 Question Id : 3330086577 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Which of the following is a eutectic reaction ?

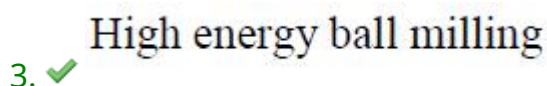
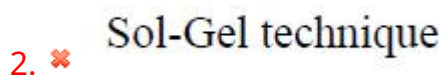
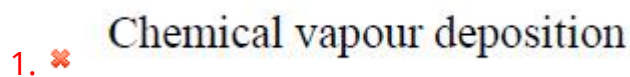
Options :



Question Number : 98 Question Id : 3330086578 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is the top down approach method for synthesis of Nano materials?

Options :



4.

✖ Chemical precipitation method

Question Number : 99 Question Id : 3330086579 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

TIG is especially useful in welding for the following alloys

Options :

1. ✖ Stainless steels
2. ✔ Aluminium and its alloys
3. ✖ Titanium and its alloys
4. ✖ Cast Irons

Question Number : 100 Question Id : 3330086580 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Electrode is consumed in _____ welding process

Options :

1. ✖ Gas
2. ✖ TIG

3. ✖ Thermit

4. ✔ Arc

Question Number : 101 Question Id : 3330086581 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Cold working of metal reduces its

Options :

1. ✔ Ductility

2. ✖ Hardness

3. ✖ Ultimate tensile strength

4. ✖ Electrical resistance

Question Number : 102 Question Id : 3330086582 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The collapsible toothpaste tube is produced by ____ extrusion

Options :

1. ✖ Direct

2. ✓ Impact

3. ✗ Tube

4. ✗ Indirect

Question Number : 103 Question Id : 3330086583 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Dislocation tangles are the regions of ____

Options :

1. ✗ Defect free areas

2. ✗ Dislocation free areas

3. ✗ Low dislocation density areas

4. ✓ High Dislocation density areas

Question Number : 104 Question Id : 3330086584 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Critical resolved shear stress is expressed by the following equation

Options :

1. ✖ $\tau_R = (P/A) \cos \phi \sin \lambda$

2. ✖ $\tau_R = (P/A) \sin \phi \cos \lambda$

3. ✔ $\tau_R = (P/A) \cos \phi \cos \lambda$

4. ✖ $\tau_R = (P/A) \sin \phi \sin \lambda$

Question Number : 105 Question Id : 3330086585 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Anti-Phase Boundaries (APB) are existing in _____ strengthening mechanism

Options :

1. ✖ Grain boundary strengthening mechanism

2. ✔ Solid solution strengthening mechanism

3. ✖ Precipitation hardening strengthening mechanism

4. ✖ Strain hardening strengthening mechanism

Question Number : 106 Question Id : 3330086586 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which alloying element does not shift TTT diagram or does not retard the transformation of austenite to pearlite or bainite?

Options :

1. ✓ Cobalt

2. ✗ Nickel

3. ✗ Copper

4. ✗ Aluminium

Question Number : 107 Question Id : 3330086587 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When two different metal placed in contact, when one end is heated, an EMF is generated. This effect is called as

Options :

1. ✗ Thomson effect

2. ✗ Temperature effect

3. ✓ Seebeck effect

4. ✗ Junction-diode effect

Question Number : 108 Question Id : 3330086588 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Calculate the Pilling-Bedworth ratio when Fe oxides to FeO. The atomic weight of Fe is 55.8gm, the atomic weight of Oxygen is 16 gm, density of Fe is 7.87 gm/cc and density of FeO is 5.70 gm/cc

Options :

1. ✗ 0.777

2. ✗ 3.777

3. ✗ 2.777

4. ✓ 1.777

Question Number : 109 Question Id : 3330086589 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Solution of system of equations $3x + y + 2z = 3, 2x - 3y - z = -3, x + 2y + z = 4$

Options :

1. ✖ (1, 2, 1)

2. ✔ (1, 2, - 1)

3. ✖ (2, 3, 1)

4. ✖ (4, 3, 2)

Question Number : 110 Question Id : 3330086590 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $f(x) = (x^2 - 16)^2$, where x is real, $f(x)$ has

Options :

Two maxima and one minimum

1. ✖

One maxima and 2 minima

2. ✔

Three minima

3. ✖

Three maxima

4. ✖

Question Number : 111 Question Id : 3330086591 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If A is an orthogonal matrix, then A^{-1} is

Options :

1. ✖ Symmetric
2. ✖ Skew- symmetric
3. ✔ Orthogonal
4. ✖ Hermitian

Question Number : 112 Question Id : 3330086592 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\vec{f} = f_1(y, z)\vec{i} + f_2(z, x)\vec{j} + f_3(x, y)\vec{k}$ then $\vec{f}$ is

Options :

1. ✖ Irrotational
2. ✔ Solenoidal
3. ✖ Both Irrotational & Solenoidal

Gradient

4. ✖

Question Number : 113 Question Id : 3330086593 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The work done in displacing a particle from $t=0$ to $t=1$ in a curve $x = t, y = t^2 + 1$ and $z = 2t^2$ in a force field $\vec{F} = (2xy, -3x, -5z)$ is

Options :

1. ✖ $-19/2$

2. ✖ $-14/3$

3. ✔ $-21/2$

4. ✖ 5

Question Number : 114 Question Id : 3330086594 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\vec{a}$ is a constant vector then $\text{div}\{\vec{a} \times (\vec{r} \times \vec{a})\} =$

Options :

1. ✔ $2a^2$

2. ✖ $3a^2$

3. ✖ $6a$

4. ✖ $4a$

Question Number : 115 Question Id : 3330086595 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $F = ax\mathbf{i} + by\mathbf{j} + cz\mathbf{k}$, where a, b, c are constants then $\iint_S \mathbf{F} \cdot \mathbf{N} \, ds$ Where s is the surface of the unit sphere

Options :

1. ✖ 0

2. ✖ $\frac{4}{3}\pi(a + b + c)^2$

3. ✔ $\frac{4}{3}\pi(a + b + c)$

4. ✖ 1

Question Number : 116 Question Id : 3330086596 Display Question Number : Yes Is Question

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

Solution of the differential equation $xy \frac{dy}{dx} = 1 + x + y + xy$ is ____

Options :

1. ✖ $\log(x(1+y)) = c$

2. ✔ $(y-x) - \log(x(1+y)) = c$

3. ✖ $(y-x) - \log(y(1+x)) = c$

4. ✖ $(y+x) - \log(x) = c$

Question Number : 117 Question Id : 3330086597 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the correct formula for Runge-Kutta 3rd order method ?

Options :

1. ✖ $y = y_0 + \frac{1}{6}(k_1 + 2k_2 + 3k_3)$

2. ✖ $y = y_0 + \frac{1}{3}(k_1 + 4k_2 + k_3)$

3. ✓ $y = y_0 + \frac{1}{6}(k_1 + 4k_2 + k_3)$

4. ✗ $y = y_0 + \frac{1}{6}(k_1 + k_2)$

Question Number : 118 Question Id : 3330086598 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

One of the two events must occur the chance of one is $\frac{2}{3}$ of the other, then odd in favour of the other are

Options :

1. ✓ 3:2

2. ✗ 1:3

3. ✗ 3:1

4. ✗ 2:3

Question Number : 119 Question Id : 3330086599 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Coefficient of correlation is independent of

Options :

1. ✖ Change of scale only
2. ✖ Change of origin only
3. ✔ Both change of scale & origin
4. ✖ No change

Question Number : 120 Question Id : 3330086600 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $x^3 - x - 4 = 0$ by bisection method first two approximations x_0 and x_1 are 1 and 2 then x_2 is

Options :

1. ✖ 1.2
2. ✖ 1.3
3. ✖ 1.4
4. ✔ 1.5

