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. ✖ Quartizite

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 $Fe\text{-}Fe_3C$ 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. ✔ $723^{0}C$

2. ✖ $1146^{0}C$

3. ✖ $1495^{0}C$

4. ✖ $910^{0}C$

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

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

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

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

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 :

1. ✖ Nucleation-and-growth phenomenon

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. ✔ $CuAl_2$

3. ✖ Cu_2Al_3

4.

✖ Cu_3Al_2

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. ✖ Babbit 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. ✔ $L_c = [\sigma \text{ X } d] / [2\ \tau_c]$

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

3. ✖ $L_c = [2\ \tau_c] / [\sigma \text{ X } d]$

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. ✖ $2CO + O_2 = 2CO_2$

2. ✖ $2C + O_2 = 2CO$

3. ✔ $C + O_2 = CO_2$

4. ✖ $2Zn + O_2 = 2ZnO$

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. ✖ CO_2 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 :

1. ✖ $L \xrightarrow{\text{Cooling}} \alpha$

2. ✔ $L \xrightarrow{\text{Cooling}} \alpha + \beta$

3. ✖ $L \xrightarrow{\text{Cooling}} \beta$

4. ✖ $\alpha + L \xrightarrow{\text{Cooling}} \beta$

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 :

1. ✖ Chemical vapour deposition

2. ✖ Sol-Gel technique

3. ✔ High energy ball milling

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. ✖ $\tau_R = (P/A)\ COS\ \varphi\ SIN\ \lambda$

2. ✖ $\tau_R = (P/A)\ SIN\ \varphi\ COS\ \lambda$

3. ✔ $\tau_R = (P/A)\ COS\ \varphi\ COS\ \lambda$

4. ✖ $\tau_R = (P/A)\ SIN\ \varphi\ SIN\ \lambda$

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 :

1. ✖ Two maxima and one minimum

2. ✔ One maxima and 2 minima

3. ✖ Three minima

4. ✖ Three maxima

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

Options :

1. ✖ Irrotational

2. ✔ Solenoidal

3. ✖ Both Irrotational & Solenoidal

4. ✖ Gradient

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 $F = axI + byJ + czK$, where a, b, c are constants then $\iint F.N\,ds$ 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