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 29th Sep 2021 Shift1
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? (SA type of questions will be always auto saved) :	Yes
Is this Group for Examiner? :	No

Metallurgy

Section Id :	8737183
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

Question Number : 1 Question Id : 873718241 Display Question Number : Yes Is Question Mandatory : No

In a closed system ---------- can be exchanged to its surroundings, but not ----------.

Options :

1. ✖ matter, energy

2. ✔ energy, matter

3. ✖ pressure, volume

4. ✖ volume, pressure

Question Number : 2 Question Id : 873718242 Display Question Number : Yes Is Question Mandatory : No

Which one of the following is considered as intensive property of a system?

Options :

1. ✖ Volume

2. ✖ Internal energy

3. ✖ Mass

4. ✔ Density

Question Number : 3 Question Id : 873718243 Display Question Number : Yes Is Question Mandatory : No

The law of conservation of energy represents ---------- law of thermodynamics.

Options :

1. ✔ first

2. ✖ second

3. ✖ third

4. ✖ zeroth

Question Number : 4 Question Id : 873718244 Display Question Number : Yes Is Question Mandatory : No

The amount of heat required to raise its temperature by one degree is known as

Options :

1. ✖ activation energy

2. ✖ chemical potential

3. ✔ heat capacity

4. ✖ specific heat

Question Number : 5 Question Id : 873718245 Display Question Number : Yes Is Question Mandatory : No

Ellingham diagrams are the ---------- vs ---------- relationships which were plotted for various oxidation and sulphidation processes of several metals and gases.

Options :

1. ✖ pressure vs volume

2. ✔ free energy vs temperature

3. ✖ pressure vs temperature

4. ✖ free energy vs volume

Question Number : 6 Question Id : 873718246 Display Question Number : Yes Is Question Mandatory : No

Phase diagrams are nothing but the depiction of equilibria between ------- and ---------

Options :

1. ✖ composition, pressure

2. ✖ pressure, temperature

3. ✖ pressure, volume

4. ✔ composition, temperature

Question Number : 7 Question Id : 873718247 Display Question Number : Yes Is Question Mandatory : No

Which one of the following law states "activity of a solute in a solution is equal to its atom or mole fraction"?

Options :

1. ✔ Raoult's Law

2. ✖ Henry's Law

3. ✖ Sievert's Law

4. ✖ Hildbrand Law

Question Number : 8 Question Id : 873718248 Display Question Number : Yes Is Question Mandatory : No

Identify the system where only one solid solution exists over the entire composition range.

Options :

1. ✖ Pb-Sn

2. ✖ Fe-C

3. ✔ Cu-Ni

4. ✖ Al-Cu

Question Number : 9 Question Id : 873718249 Display Question Number : Yes Is Question Mandatory : No

Rate constant of a reaction does not depend on ----------

Options :

1. ✖ temperature

2. ✔ concentration of reactants and products

3. ✖ activation energy

4. ✖ catalyst

Question Number : 10 Question Id : 873718250 Display Question Number : Yes Is Question Mandatory : No

Rate of a reaction may be expressed in terms of

Options :

1. ✖ change in volume with temperature

2. ✖ change in volume per unit time

3. ✖ change in mass of a component with temperature

4. ✔ change in mass of a component per unit time

Question Number : 11 Question Id : 873718251 Display Question Number : Yes Is Question Mandatory : No

When heating one end of a metal plate, other end gets hot because of

Options :

1. ✖ the resistance of the metal

2. ✖ the mobility of atoms in the metal

3. ✔ the energized electrons moving to other end of metal

4. ✖ minor perturbation in the energy of atoms

Question Number : 12 Question Id : 873718252 Display Question Number : Yes Is Question Mandatory : No

How many modes of heat transfer are generally recognized?

Options :

1. ✖ One

2. ✖ Two

3. ✔ Three

4. ✖ Four

Question Number : 13 Question Id : 873718253 Display Question Number : Yes Is Question Mandatory : No

What is the unit of the 'rate of heat transfer'?

Options :

1. ✔ Watt

2. ✖ Joule

3. ✖ Newton

4. ✖ Pascal

Question Number : 14 Question Id : 873718254 Display Question Number : Yes Is Question Mandatory : No

Diffusion of a component in a system is governed by

Options :

1. ✖ Stokes' law

2. ✔ Fick's first law

3. ✖ Newton's law

4. ✖ Sievert's law

Question Number : 15 Question Id : 873718255 Display Question Number : Yes Is Question Mandatory : No

Thermal conductivity of solid metals ---------- with rise in temperature.

Options :

1. ✖ increases

2. ✔ decreases

3. ✖ remains constant

4. ✖ unpredictable

Question Number : 16 Question Id : 873718256 Display Question Number : Yes Is Question Mandatory : No

Heat transfer by molecular collision is referred to as heat transfer by ----------

Options :

1. ✖ conduction

2. ✔ convection

3. ✖ radiation

4. ✖ scattering

Question Number : 17 Question Id : 873718257 Display Question Number : Yes Is Question Mandatory : No

Heat is transferred by all three modes of transfer, viz, conduction, convection and radiation in ----------

Options :

1. ✖ electric heater

2. ✖ steam condenser

3. ✖ melting of ice

4. ✔ boiler

Question Number : 18 Question Id : 873718258 Display Question Number : Yes Is Question Mandatory : No

Find the operation where diffusion of solids does not occur.

Options :

1. ✔ Distillation

2. ✖ Leaching

3. ✖ Drying

4. ✖ Adsorption

Question Number : 19 Question Id : 873718259 Display Question Number : Yes Is Question Mandatory : No

Identify the fluid having highest viscosity.

Options :

1. ✖ Water

2. ✔ Honey

3. ✖ Blood

4. ✖ Air

Question Number : 20 Question Id : 873718260 Display Question Number : Yes Is Question Mandatory : No

The pressure for an ideal gas can be given by ----------

Options :

1. ✔ $pV = nRT$

2. ✖ $p = RT$

3. ✖ $pV = T$

4. ✖ $p = VT$

Question Number : 21 Question Id : 873718261 Display Question Number : Yes Is Question Mandatory : No

Bernoulli's principle is derived from ----------

Options :

1. ✖ Conservation of mass

2. ✖ Newton's law of motion

3. ✔ Conservation of energy

4. ✖ Conservation of momentum

Question Number : 22 Question Id : 873718262 Display Question Number : Yes Is Question Mandatory : No

Frictional force encountered after commencement of motion is called ----------

Options :

1. ✖ Kinematic friction

2. ✖ Frictional resistance

3. ✖ Limiting friction

4. ✔ Dynamic friction

Question Number : 23 Question Id : 873718263 Display Question Number : Yes Is Question Mandatory : No

Which of the following is found in the form of Monazite sand along the Kerala coast?

Options :

1. ✖ Uranium

2. ✔ Thorium

3. ✖ Chromite

4. ✖ Graphite

Question Number : 24 Question Id : 873718264 Display Question Number : Yes Is Question Mandatory : No

Which one of the following is the ore for iron?

Options :

1. ✖ Chalcocite

2. ✔ Magnetite

3. ✖ Bauxite

4. ✖ Wolframite

Question Number : 25 Question Id : 873718265 Display Question Number : Yes Is Question Mandatory : No

Electrolytic refining is used to purify ---------- metals.

Options :

1. ✖ Zn and Hg

2. ✖ Ti and Zr

3. ✔ Cu and Zn

4. ✖ Ge and Si

Question Number : 26 Question Id : 873718266 Display Question Number : Yes Is Question Mandatory : No

The energy expended during comminution is proportional to the area of the new surface produced because of particle fragmentation is known as ---------- law.

Options :

1. ✔ Rittinger's

2. ✖ Faraday's

3. ✖ Henry's

4. ✖ Hess's

Question Number : 27 Question Id : 873718267 Display Question Number : Yes Is Question Mandatory : No

When a sulphide ore is roasted to a point where almost the entire sulphur content is eliminated, the residue is called ----------

Options :

1. ✖ volatilizing roast

2. ✖ sulphating roast

3. ✖ calcination

4. ✔ dead roast

Question Number : 28 Question Id : 873718268 Display Question Number : Yes Is Question Mandatory : No

Hydrometallurgical methods are ideally suited for ----------

Options :

1. ✖ rich and complex ores

2. ✔ lean and complex ores

3. ✖ rich and simple ores

4. ✖ all of these

Question Number : 29 Question Id : 873718269 Display Question Number : Yes Is Question Mandatory : No

Production of magnesium from sea water is called ----------

Options :

1. ✖ Magnotherm process

2. ✖ Kroll process

3. ✔ Dow process

4. ✖ Down process

Question Number : 30 Question Id : 873718270 Display Question Number : Yes Is Question Mandatory : No

Which one of the following process is direct smelting?

Options :

1. ✔ COREX

2. ✖ Vacuum Arc Degassing (VAD)

3. ✖ Blast Furnace

4. ✖ LD

Question Number : 31 Question Id : 873718271 Display Question Number : Yes Is Question Mandatory : No

Identify the basic oxygen furnace from the following.

Options :

1. ✖ Open hearth furnace

2. ✖ Bessemer converter

3. ✔ LD converter

4. ✖ Cupola

Question Number : 32 Question Id : 873718272 Display Question Number : Yes Is Question Mandatory : No

Hall – Heroult Process involves dissolution of ---------- in ----------.

Options :

1. ✖ brucite, cryolite

2. ✖ carnallite, alumina

3. ✔ alumina, cryolite

4. ✖ olivine, brucite

Question Number : 33 Question Id : 873718273 Display Question Number : Yes Is Question Mandatory : No

Which one is the correct sequence of operations in the case of copper extraction from sulphide ore?

Options :

1. ✖ Roasting – smelting – concentration – converting – refining

2. ✖ Concentration – smelting – converting – roasting – refining

3. ✔ Concentration – roasting – smelting – converting – refining

4. ✖ Smelting – concentration – Roasting – converting – refining

Question Number : 34 Question Id : 873718274 Display Question Number : Yes Is Question Mandatory : No

---------- is used for bauxite ore leaching in Bayer process.

Options :

1. ✖ Fe_2O_3

2. ✖ TiO_2

3. ✖ SiO_2

4. ✔ NaOH

Question Number : 35 Question Id : 873718275 Display Question Number : Yes Is Question Mandatory : No

---------- is used as a reducing metal in Kroll's process for titanium production.

Options :

1. ✖ Manganese

2. ✔ Magnesium

3. ✖ Zinc

4. ✖ Lead

Question Number : 36 Question Id : 873718276 Display Question Number : Yes Is Question Mandatory : No

---------- can be used to produce alloy steels.

Options :

1. ✖ L D process

2. ✖ Open hearth furnace

3. ✔ Electric arc furnace

4. ✖ Acid Bessemer process

Question Number : 37 Question Id : 873718277 Display Question Number : Yes Is Question Mandatory : No

Which one of the following is main source of sulphur in the blast furnace charge?

Options :

1. ✔ Coke

2. ✖ Iron ore

3. ✖ Flux

4. ✖ Scrap

Question Number : 38 Question Id : 873718278 Display Question Number : Yes Is Question Mandatory : No

Microstructure of duplex stainless steel is ----------

Options :

1. ✖ ferrite + pearlite

2. ✔ ferrite + austenite

3. ✖ ferrite + cementite

4. ✖ pearlite + cementite

Question Number : 39 Question Id : 873718279 Display Question Number : Yes Is Question Mandatory : No

Argon Oxygen Decarburization (AOD) is employed during refining process to produce steel with low ----------

Options :

1. ✖ iron

2. ✖ chromium

3. ✖ nickel

4. ✔ carbon

Question Number : 40 Question Id : 873718280 Display Question Number : Yes Is Question Mandatory : No

Continuous casting process is employed in industries that require ---------- of steel cast.

Options :

1. ✖ high quality

2. ✖ low yield

3. ✔ high yield

4. ✖ low carbon

Question Number : 41 Question Id : 873718281 Display Question Number : Yes Is Question Mandatory : No

Which one of the following cannot be used for steel melting?

Options :

1. ✔ Blast Furnace

2. ✖ Bessemer Converter

3. ✖ Electric Arc Furnace

4. ✖ Electric Induction Furnace

Question Number : 42 Question Id : 873718282 Display Question Number : Yes Is Question Mandatory : No

Capacity of a refractory brick to withstand sudden changes in temperature is called --------

Options :

1. ✖ refractoriness

2. ✔ spalling resistance

3. ✖ refractoriness under load (RUL)

4. ✖ all of these

Question Number : 43 Question Id : 873718283 Display Question Number : Yes Is Question Mandatory : No

The heat required to run the ESR process is generated by the ---------- in the slag bath.

Options :

1. ✖ Electrode potential

2. ✖ Activation energy

3. ✖ Free energy

4. ✔ Joule effect

Question Number : 44 Question Id : 873718284 Display Question Number : Yes Is Question Mandatory : No

Which among the following is not a factor that leads to macro-segregation in ingots?

Options :

1. ✔ Expansion due to mild heating

2. ✖ Density differences between the solid and liquid

3. ✖ Density differences in the interdendritic liquid

4. ✖ Shrinkage due to solidification and thermal contraction

Question Number : 45 Question Id : 873718285 Display Question Number : Yes Is Question Mandatory : No

The packing factor for face centered cubic structure is

Options :

1. ✖ 0.50

2. ✖ 0.68

3. ✔ 0.74

4. ✖ 0.82

Question Number : 46 Question Id : 873718286 Display Question Number : Yes Is Question Mandatory : No

Hexagonal crystal system has

Options :

1. ✖ three unequal axes, no two of which are perpendicular

2. ✔ three equal coplanar axes at 120°and a fourth unequal axis perpendicular to their plane

3. ✖ three unequal axes, one of which is perpendicular to the other two

4. ✖ three equal axes, mutually perpendicular

Question Number : 47 Question Id : 873718287 Display Question Number : Yes Is Question Mandatory : No

A covalent bond is a chemical bond that involves

Options :

1. ✔ sharing of electron pairs between atoms

2. ✖ sharing of free electrons among a structure of positively charged irons

3. ✖ electrostatic attraction between oppositely charged ions in a chemical compound

4. ✖ attraction and repulsions between atoms, molecules, and surfaces

Question Number : 48 Question Id : 873718288 Display Question Number : Yes Is Question Mandatory : No

Ceramics are -------, --------- and --------

Options :

1. ✖ strong, ductile, and opaque to light

2. ✖ soft, ductile, and combustible

3. ✖ hard, ductile, and opaque to light

4. ✔ hard, brittle, and opaque to light

Question Number : 49 Question Id : 873718289 Display Question Number : Yes Is Question Mandatory : No

Identify from the following that represents interstitial solid solution.

Options :

1. ✖ copper and zinc

2. ✔ carbon and iron

3. ✖ silver and gold

4. ✖ copper and tin

Question Number : 50 Question Id : 873718290 Display Question Number : Yes Is Question Mandatory : No

What are the factors that favor substitutional solid solutions?

Options :

1. ✖ crystal structure

2. ✖ relative size

3. ✖ chemical affinity

4. ✔ all of the above

Question Number : 51 Question Id : 873718291 Display Question Number : Yes Is Question Mandatory : No

Phase diagram is also known as

Options :

1. ✔ equilibrium diagram

2. ✖ stress-strain diagram

3. ✖ S-curve

4. ✖ Ellingham diagram

Question Number : 52 Question Id : 873718292 Display Question Number : Yes Is Question Mandatory : No

Solid solution is one in which

Options :

1. ✖ two metals are not soluble in solid state

2. ✖ two metals are partially soluble in solid state

3. ✔ two metals are completely soluble in solid state

4. ✖ two metals are not soluble in liquid stage

Question Number : 53 Question Id : 873718293 Display Question Number : Yes Is Question Mandatory : No

Eutectic temperature is the one at which

Options :

1. ✖ liquid on cooling gives liquid and solid

2. ✔ liquid on cooling gives two solids

3. ✖ solid on heating gives new solid

4. ✖ solid on heating gives liquid and solid

Question Number : 54 Question Id : 873718294 Display Question Number : Yes Is Question Mandatory : No

Peritectoid reaction involves

Options :

1. ✔ solid 1 + solid 2 on cooling give new solid 3

2. ✖ solid 1 on cooling gives solid 2 + solid 3

3. ✖ liquid on cooling gives solid 1 + solid 2

4. ✖ liquid on cooling gives solid

Question Number : 55 Question Id : 873718295 Display Question Number : Yes Is Question Mandatory : No

Identify allotropic metal.

Options :

1. ✖ silver

2. ✖ copper

3. ✖ aluminium

4. ✔ iron

Question Number : 56 Question Id : 873718296 Display Question Number : Yes Is Question Mandatory : No

Pearlite is nothing but combination of

Options :

1. ✔ ferrite + cementite

2. ✖ austenite + cementite

3. ✖ austenite + ferrite

4. ✖ ledeburite + ferrite

Question Number : 57 Question Id : 873718297 Display Question Number : Yes

Mandatory : No

Full annealing consists in

Options :

1. ✖ heating the steel to the proper temperature and then oil quenching

2. ✖ heating the steel to the proper temperature and then air cooling

3. ✔ heating the steel to the proper temperature and then cooling slowly in the furnace

4. ✖ heating the steel to the proper temperature and then water quenching

Question Number : 58 Question Id : 873718298 Display Question Number : Yes Is Question Mandatory : No

Finer the grain better the strength. This is arrived empirically by

Options :

1. ✖ Bragg equation

2. ✔ Hall Petch equation

3. ✖ Willingham equation

4. ✖ Renault equation

Question Number : 59 Question Id : 873718299 Display Question Number : Yes Is Question Mandatory : No

Morphology of carbon in grey cast iron is

Options :

1. ✖ spheroidal

2. ✖ combined form as cementite

3. ✖ nodular

4. ✔ flaky

Question Number : 60 Question Id : 873718300 Display Question Number : Yes Is Question Mandatory : No

In building construction, the steel which is used for pillars, slabs, etc. is called

Options :

1. ✖ alloy steel

2. ✔ mild steel

3. ✖ high carbon steel

4. ✖ high carbon high chromium steel

Question Number : 61 Question Id : 873718301 Display Question Number : Yes Is Question Mandatory : No

X-ray diffraction patterns are used for studying crystal structure of solids because

Options :

1. ✔ their wavelengths are comparable to inter atomic distances

2. ✖ they are electromagnetic radiation, and hence do not interact with crystals

3. ✖ their high frequency enables rapid analysis

4. ✖ they have very high energy, hence they can penetrate through solids

Question Number : 62 Question Id : 873718302 Display Question Number : Yes Is Question Mandatory : No

Which thermoplastic resin is used for mounting a specimen in metallography?

Options :

1. ✖ Polycarbonate

2. ✖ Acetal copolymer

3. ✔ Lucite

4. ✖ Polystyrene

Question Number : 63 Question Id : 873718303 Display Question Number : Yes Is Question Mandatory : No

Which of the following is used in electron microscope?

Options :

1. ✖ Electron beams

2. ✖ Light waves

3. ✖ Magnetic fields

4. ✔ Electron beams and magnetic fields

Question Number : 64 Question Id : 873718304 Display Question Number : Yes Is Question Mandatory : No

Which of the following property can be enhanced by reinforcing SiC in aluminium alloy?

Options :

1. ✖ Ductility

2. ✖ Density

3. ✖ Toughness

4. ✔ Wear resistance

Question Number : 65 Question Id : 873718305 Display Question Number : Yes Is Question Mandatory : No

---------- ceramic product is mostly used as pigment in paints.

Options :

1. ✖ ZrO_2

2. ✔ TiO_2

3. ✖ SiO_2

4. ✖ UO_2

Question Number : 66 Question Id : 873718306 Display Question Number : Yes Is Question Mandatory : No

Important assumptions in strength of materials are that the 'body which is being analyzed' is

Options :

1. ✔ continuous, homogeneous, and isotropic

2. ✖ porous, heterogeneous, and isotropic

3. ✖ continuous, homogeneous, and anisotropic

4. ✖ discontinuous, homogeneous, and anisotropic

Question Number : 67 Question Id : 873718307 Display Question Number : Yes Is Question Mandatory : No

Concept of Hooke's law is

Options :

1. ✖ pressure is inversely proportional to temperature

2. ✖ pressure is proportional to temperature

3. ✔ stress is proportional to strain

4. ✖ stress is inversely proportional to strain

Question Number : 68 Question Id : 873718308 Display Question Number : Yes Is Question Mandatory : No

Modulus of elasticity (E) is expressed as

Options :

1. ✖ average strain / average stress

2. ✔ average stress / average strain

3. ✖ average pressure / average temperature

4. ✖ average temperature / average pressure

Question Number : 69 Question Id : 873718309 Display Question Number : Yes Is Question Mandatory : No

Identify the material exhibiting upper and lower yield points in stress-strain diagram.

Options :

1. ✖ Grey cast iron

2. ✖ Aluminium

3. ✖ Copper

4. ✔ Mild steel

Question Number : 70 Question Id : 873718310 Display Question Number : Yes Is Question Mandatory : No

Dislocation is also known as

Options :

1. ✖ point defect

2. ✔ line defect

3. ✖ plane defect

4. ✖ vacancy

Question Number : 71 Question Id : 873718311 Display Question Number : Yes Is Question Mandatory : No

Which of the following dislocation can glide but not climb?

Options :

1. ✖ Edge dislocation

2. ✔ Screw dislocation

3. ✖ Jog dislocation

4. ✖ Mixed dislocation

Question Number : 72 Question Id : 873718312 Display Question Number : Yes Is Question Mandatory : No

What is the unit of dislocation density?

Options :

1. ✔ mm^{-2}

2. ✖ mm^{-3}

3. ✖ mm

4. ✖ mm^{2}

Question Number : 73 Question Id : 873718313 Display Question Number : Yes Is Question Mandatory : No

Identify the one which is not a strengthening mechanism

Options :

1. ✔ grain size increment

2. ✖ grain size reduction

3. ✖ strain hardening

4. ✖ solid solution strengthening

Question Number : 74 Question Id : 873718314 Display Question Number : Yes Is Question Mandatory : No

Which of the following is not a way of interaction between solute atoms and dislocations?

Options :

1. ✖ stacking fault interaction

2. ✖ modulus interaction

3. ✔ plastic interaction

4. ✖ elastic interaction

Question Number : 75 Question Id : 873718315 Display Question Number : Yes Is Question Mandatory : No

Identify the odd point in the following:

Options :

1. ✖ proportional limit

2. ✖ elastic limit

3. ✖ yield point

4. ✔ fracture point

Question Number : 76 Question Id : 873718316 Display Question Number : Yes Is Question Mandatory : No

Time dependent recoverable deformation under load is called ---------- deformation.

Options :

1. ✖ elastic

2. ✔ anelastic

3. ✖ elastic after effect

4. ✖ visco elastic

Question Number : 77 Question Id : 873718317 Display Question Number : Yes Is Question Mandatory : No

--------- of material can be defined as its ability to resist a fluctuating or repetitive stress.

Options :

1. ✖ Tensile strength

2. ✖ Impact strength

3. ✔ Fatigue strength

4. ✖ Creep strength

Question Number : 78 Question Id : 873718318 Display Question Number : Yes Is Question Mandatory : No

Fatigue curves are popularly known as ---------- curves.

Options :

1. ✔ S-N

2. ✖ N

3. ✖ R

4. ✖ S

Question Number : 79 Question Id : 873718319 Display Question Number : Yes Is Question Mandatory : No

In which of the following stage the deformation rate increases and causes failure?

Options :

1. ✖ transient creep stage

2. ✖ constant creep stage

3. ✖ steady stage creep stage

4. ✔ fracture stage

Question Number : 80 Question Id : 873718320 Display Question Number : Yes Is Question Mandatory : No

Ternary stage creep is associated with ----------

Options :

1. ✖ strain hardening

2. ✖ recovery

3. ✔ necking

4. ✖ all of the above

Question Number : 81 Question Id : 873718321 Display Question Number : Yes Is Question Mandatory : No

Which of the following part of mechanics deals with study of crack propagation?

Options :

1. ✖ solid mechanics

2. ✖ fluid mechanics

3. ✖ applied mechanics

4. ✔ fracture mechanics

Question Number : 82 Question Id : 873718322 Display Question Number : Yes Is Question Mandatory : No

Fracture voids usually form at

Options :

1. ✖ inclusions

2. ✖ second phase particles

3. ✖ grain boundary triple points

4. ✔ all of the above

Question Number : 83 Question Id : 873718323 Display Question Number : Yes Is Question Mandatory : No

What causes brittle fracture?

Options :

1. ✔ notch

2. ✖ vacancy

3. ✖ dislocation

4. ✖ holes

Question Number : 84 Question Id : 873718324 Display Question Number : Yes Is Question Mandatory : No

Which factor affects ductile brittle transition behaviour the most?

Options :

1. ✖ strain rate

2. ✔ temperature

3. ✖ triaxiality

4. ✖ notching

Question Number : 85 Question Id : 873718325 Display Question Number : Yes Is Question Mandatory : No

Hounsfield tensometer can be used to perform

Options :

1. ✔ tensile test

2. ✖ compressive test

3. ✖ hardness test

4. ✖ toughness test

Question Number : 86 Question Id : 873718326 Display Question Number : Yes Is Question Mandatory : No

Which among the following is a type of destructive test?

Options :

1. ✖ ultrasonic test

2. ✔ cupping test

3. ✖ magnetic particle test

4. ✖ dye penetrant

Question Number : 87 Question Id : 873718327 Display Question Number : Yes Is Question Mandatory : No

What indenter is used for Brinell test?

Options :

1. ✔ hardened steel ball

2. ✖ diamond ball

3. ✖ diamond prism

4. ✖ steel prism

Question Number : 88 Question Id : 873718328 Display Question Number : Yes Is Question Mandatory : No

Sprue in casting refers to ----------

Options :

1. ✖ gate

2. ✖ runner

3. ✖ riser

4. ✔ vertical passage

Question Number : 89 Question Id : 873718329 Display Question Number : Yes Is Question Mandatory : No

In permanent mold casting method ----------

Options :

1. ✖ molten metal is forced into mould under high pressure

2. ✖ molten metal is poured into a rotating mould

3. ✔ molten metal is fed into the cavity in metallic mould by gravity

4. ✖ cavity is filled with a precalculated quantity of metal and a core is inserted to force the metal into cavity

Question Number : 90 Question Id : 873718330 Display Question Number : Yes Is Question Mandatory : No

In hot chamber method of die casting ----------

Options :

1. ✔ the melting pot is integral with die casting machine

2. ✖ the melting pot is separate from the die casting machine

3. ✖ the melting pot location has nothing to do with such a classification

4. ✖ high temperature and low pressure alloys are used

Question Number : 91 Question Id : 873718331 Display Question Number : Yes Is Question Mandatory : No

Which of the following casting methods utilizes wax pattern?

Options :

1. ✖ Shell moulding

2. ✔ Investment casting

3. ✖ Slush casting

4. ✖ Plaster moulding

Question Number : 92 Question Id : 873718332 Display Question Number : Yes Is Question Mandatory : No

In centrifugal casting,

Options :

1. ✖ steel core is used

2. ✖ cast iron core is used

3. ✖ hard sand core is used

4. ✔ no core is used

Question Number : 93 Question Id : 873718333 Display Question Number : Yes Is Question Mandatory : No

Which of the following metal forming processes performs squeezing out of material through a hole?

Options :

1. ✖ forging

2. ✖ rolling

3. ✔ extrusion

4. ✖ drawing

Question Number : 94 Question Id : 873718334 Display Question Number : Yes Is Question Mandatory : No

What is the best suitable process for making the wires?

Options :

1. ✖ forging

2. ✔ drawing

3. ✖ extrusion

4. ✖ rolling

Question Number : 95 Question Id : 873718335 Display Question Number : Yes Is Question Mandatory : No

Which of the following components are manufactured by the sheet metal forming process?

Options :

1. ✖ connecting rods

2. ✖ engine blocks

3. ✔ car bodies

4. ✖ electric wires

Question Number : 96 Question Id : 873718336 Display Question Number : Yes Is Question Mandatory : No

Good surface finish and better dimensional accuracy can be achieved in

Options :

1. ✔ cold working process

2. ✖ hot working process

3. ✖ both cold and hot working processes

4. ✖ neither cold nor hot working process

Question Number : 97 Question Id : 873718337 Display Question Number : Yes Is Question Mandatory : No

A moving mandrel is used in

Options :

1. ✖ wire drawing

2. ✔ tube drawing

3. ✖ metal cutting

4. ✖ forging

Question Number : 98 Question Id : 873718338 Display Question Number : Yes Is Question Mandatory : No

Hot extrusion involves prior heating of steel billet to ---------- temperature.

Options :

1. ✔ above its recrystallization

2. ✖ below its recrystallization

3. ✖ low

4. ✖ high

Question Number : 99 Question Id : 873718339 Display Question Number : Yes Is Question Mandatory : No

The most commonly used flame in gas welding is ----------

Options :

1. ✔ neutral

2. ✖ oxidizing

3. ✖ carburizing

4. ✖ all of the above

Question Number : 100 Question Id : 873718340 Display Question Number : Yes Is Question Mandatory : No

Distortion in welding occurs due to ----------

Options :

1. ✖ use of excessive current

2. ✔ improper clamping methods

3. ✖ use of wrong electrodes

4. ✖ oxidation of weld pool

Question Number : 101 Question Id : 873718341 Display Question Number : Yes Is Question Mandatory : No

Which of the following is strongest for brazing joints?

Options :

1. ✖ butt

2. ✖ scarf (inclined)

3. ✔ lap

4. ✖ all are equally strong

Question Number : 102 Question Id : 873718342 Display Question Number : Ye

Mandatory : No

Which of the following equipment is generally used for arc welding?

Options :

1. ✖ single phase alternator

2. ✖ two phase alternator

3. ✖ three phase alternator

4. ✔ transformer

Question Number : 103 Question Id : 873718343 Display Question Number : Yes Is Question Mandatory : No

Which of the following welding processes use consumable electrode?

Options :

1. ✖ Submerged arc welding

2. ✔ MIG welding

3. ✖ TIG welding

4. ✖ CIG welding

Question Number : 104 Question Id : 873718344 Display Question Number : Yes Is Question Mandatory : No

Pure copper powder can be effectively produced by

Options :

1. ✖ atomization

2. ✖ reduction

3. ✖ crushing

4. ✔ electrolysis

Question Number : 105 Question Id : 873718345 Display Question Number : Yes Is Question Mandatory : No

Sintering temperature for aluminium and its alloys is

Options :

1. ✖ 100°C - 150°C

2. ✖ 150°C - 200°C

3. ✖ 250°C - 350°C

4. ✔ 450°C - 550°C

Question Number : 106 Question Id : 873718346 Display Question Number : Yes Is Question Mandatory : No

Tungsten carbide tools are made by

Options :

1. ✔ powder metallurgy

2. ✖ machining

3. ✖ welding

4. ✖ casting

Question Number : 107 Question Id : 873718347 Display Question Number : Yes Is Question Mandatory : No

---------- are used in radiography for the inspection of castings.

Options :

1. ✔ X- rays

2. ✖ Infrared rays

3. ✖ Ultraviolet rays

4. ✖ Visible rays

Question Number : 108 Question Id : 873718348 Display Question Number : Yes Is Question Mandatory : No

---------- test uses the principle of capillary action.

Options :

1. ✖ Radiography

2. ✖ Ultrasonic

3. ✔ Dye penetrant

4. ✖ Eddy current

Question Number : 109 Question Id : 873718349 Display Question Number : Ye

Mandatory : No

Non-destructive testing is used to determine

Options :

1. ✖ location of defects

2. ✖ chemical composition

3. ✖ corrosion of metal

4. ✔ all of the above

Question Number : 110 Question Id : 873718350 Display Question Number : Yes Is Question Mandatory : No

Which of the following methods of inspection is mostly used for ferromagnetic materials?

Options :

1. ✖ Acoustic emission test

2. ✖ Ultrasonic inspection

3. ✔ Magnetic particle inspection

4. ✖ Visual inspection

Question Number : 111 Question Id : 873718351 Display Question Number : Yes Is Question Mandatory : No

The following differential equation has

$$2\frac{d^2y}{dt^2}+4\left(\frac{dy}{dt}\right)^3+y^2+2=t$$

Options :

1. ✖ degree =2, order =1

2. ✔ degree =1, order =2

3. ✖ degree =4, order =3

4. ✖ degree =1, order =1

Question Number : 112 Question Id : 873718352 Display Question Number : Yes Is Question Mandatory : No

For $\frac{d^2y}{dx^2}+4\left(\frac{dy}{dx}\right)+3y=3e^{2x}$, the particular integral is

Options :

1. ✔ $\frac{1}{5}e^{2x}$

2. ✖ $\frac{1}{3}e^{2x}$

3. ✖ $\frac{1}{17}e^{2x}$

4. ✖ $\frac{1}{2}e^{2x}$

Question Number : 113 Question Id : 873718353 Display Question Number : Yes Is Question Mandatory : No

The directional derivative of $f = x^2yz + 4xz^2$ at $(1, -2, -1)$ in the direction of

$2\bar{i} - \bar{j} - 2\bar{k}$ is

Options :

1. ✔ $\frac{37}{3}$

2. ✖ $\frac{3}{37}$

3. ✖ $\frac{13}{3}$

4. ✖ $\frac{22}{3}$

Question Number : 114 Question Id : 873718354 Display Question Number : Yes Is Question Mandatory : No

If $\bar{r} = x\bar{i} + y\bar{j} + z\bar{k}$, then $\nabla . \bar{r} =$

Options :

1. ✖ 1

2. ✖ 0

3. ✖ 2

4. ✔ 3

Question Number : 115 Question Id : 873718355 Display Question Number : Yes Is Question Mandatory : No

In the case of bisection method, the convergence is

Options :

1. ✖ biquadratic

2. ✖ quadratic

3. ✔ linear

4. ✖ cubic

Question Number : 116 Question Id : 873718356 Display Question Number : Yes Is Question Mandatory : No

A continuous random variable X that can assume any value between x = 2 and x = 5 has a density function given by $f(x)=k(1+x)$. Then $P[X<4]=$

Options :

1. ✖ $\frac{5}{27}$

2. ✖ $\frac{1}{27}$

3. ✔ $\frac{16}{27}$

4. ✖ $\frac{1}{4}$

Question Number : 117 Question Id : 873718357 Display Question Number : Yes Is Question Mandatory : No

The median of the numbers 11, 10, 12, 13, 9 is

Options :

1. ✖ 9

2. ✔ 11

3. ✖ 9.5

4. ✖ 10.5

Question Number : 118 Question Id : 873718358 Display Question Number : Yes Is Question Mandatory : No

If $A=\begin{bmatrix}1 & 2\\ 2 & -1\end{bmatrix}$, then $A^8=$

Options :

1. ✔ 625 I

2. ✖ 5 I

3. ✖ 6 I

4. ✖ 10 I

Question Number : 119 Question Id : 873718359 Display Question Number : Yes Is Question Mandatory : No

If $\lambda_1, \lambda_2, \lambda_3 ------ \lambda_n$ are the latent roots of a matrix A, then A^2 has the latent roots

Options :

1. ✖ $\lambda_1, \lambda_2, \lambda_3 ------- \lambda_n$

2. ✔ $\lambda^2_1, \lambda_2^2, \lambda_3^2 ------- \lambda_n^2$

3. ✖ $\lambda^3_1, \lambda_2^3, \lambda_3^3 ------- \lambda_n^3$

4. ✖ $1+\lambda_1,\ 1+\lambda_2,\ 1+\lambda_3 ------ 1+\lambda_n$

Question Number : 120 Question Id : 873718360 Display Question Number : Yes Is Question Mandatory : No

Consider the function $f(z) = u + iv = \overline{z}$

Options :

1. ✖ $\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}$

2. ✖ $\frac{\partial u}{\partial y} \neq -\frac{\partial v}{\partial x}$

3. ✖ $f(z)$ is analytic everywhere

4. ✔ $f(z)$ is not analytic at any point