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 Shift1Duration :120Total 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):

Is this Group for Examiner?: No

Metallurgy

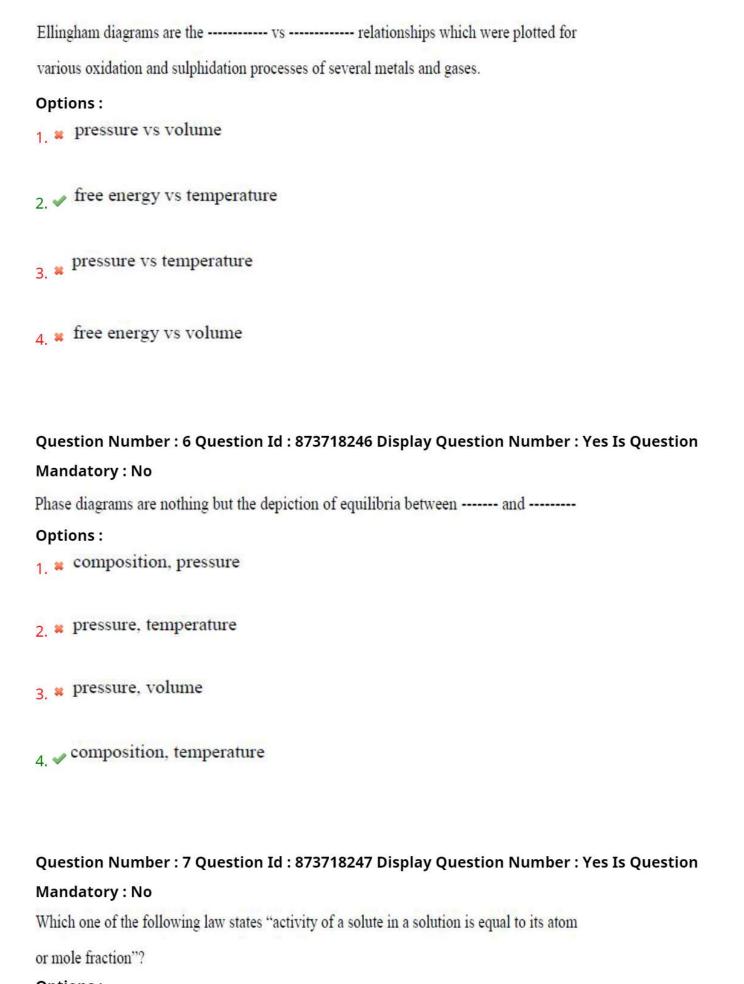
Yes

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	Yes
Clear Response :	res
Question Number : 1 Question Id : 873718241 Displa	ay Question Number : Yes Is Question
Mandatory : No	
In a closed system can be exchanged to its surround	dings, but not
Options:	
1. * matter, energy	
2. ✓ energy, matter	
Day Committee and the same	
3. * pressure, volume	
volume pressure	
4. * volume, pressure	
Question Number : 2 Question Id : 873718242 Displa	ay 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	

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

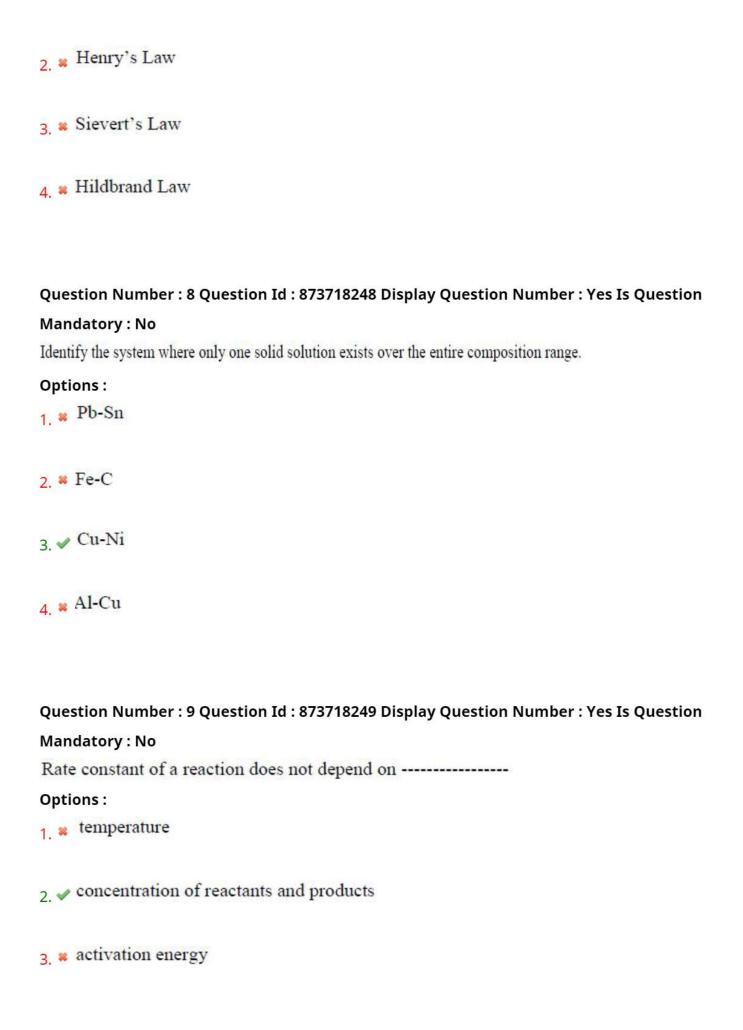
4. Density

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



Options:

1. Raoult's Law



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

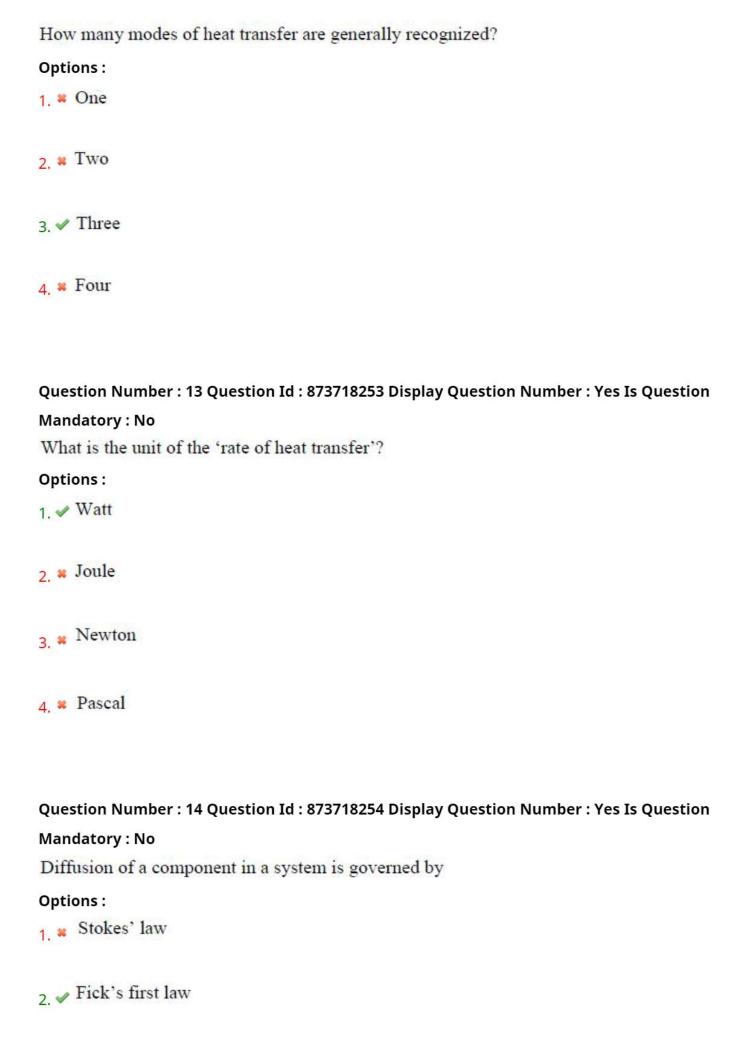
2. * the mobility of atoms in the metal

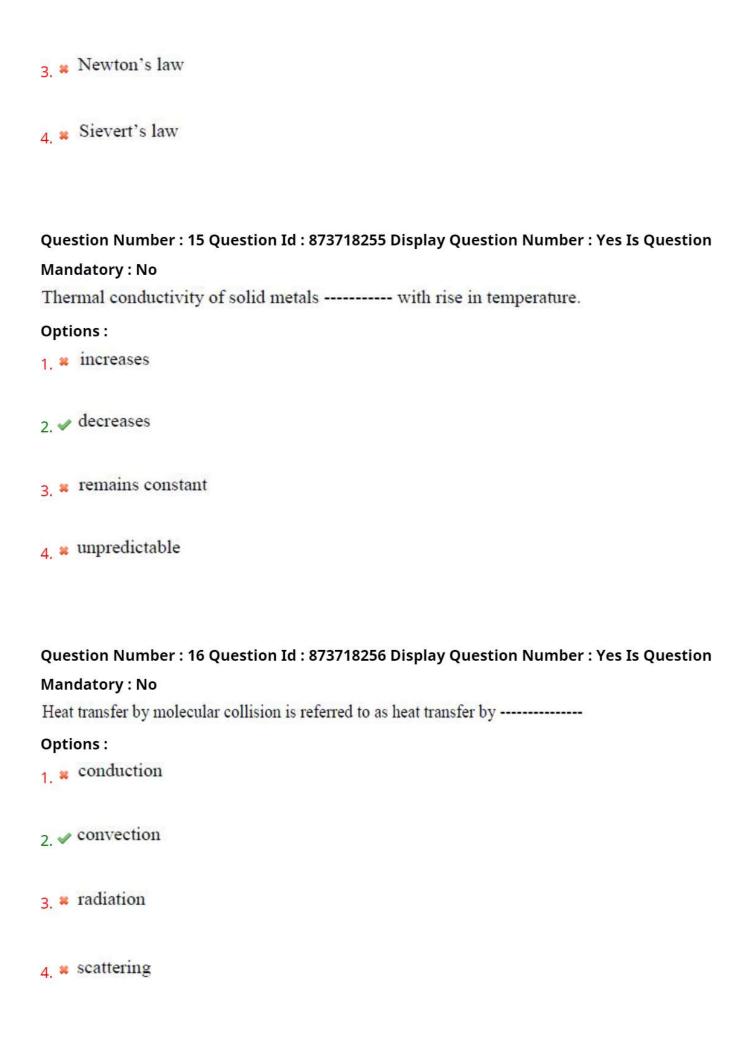
3. w the energized electrons moving to other end of metal

4. minor perturbation in the energy of atoms

Question Number : 12 Question Id : 873718252 Display Question Number : Yes Is Question

Mandatory : No





${\bf Question\ Number: 17\ Question\ Id: 873718257\ Display\ Question\ Number: Yes\ Is\ Question}$
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

Identify the fluid having highest viscosity.

Mandatory: No

Options:

- 1. Water
- 2. W 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:

$$1. \checkmark pV = nRT$$

$$2. \times p = RT$$

$$3. \times pV = T$$

Question Number: 21 Question Id: 873718261 Display Question Number: Yes Is Question

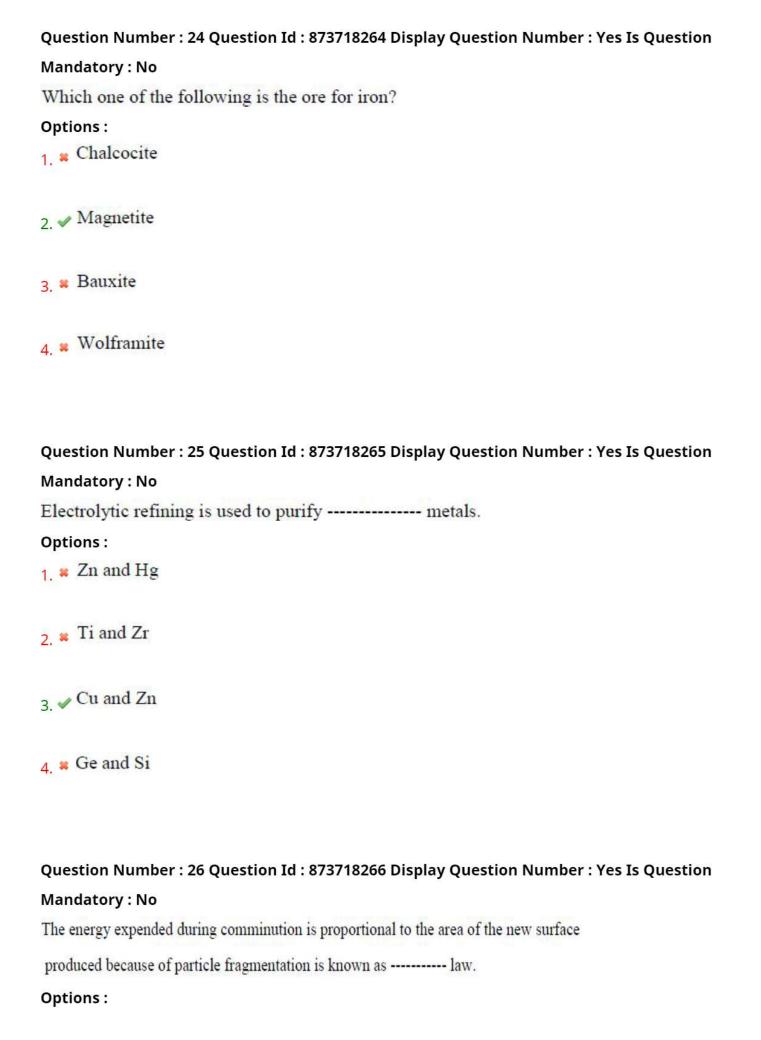
Mandatory: No

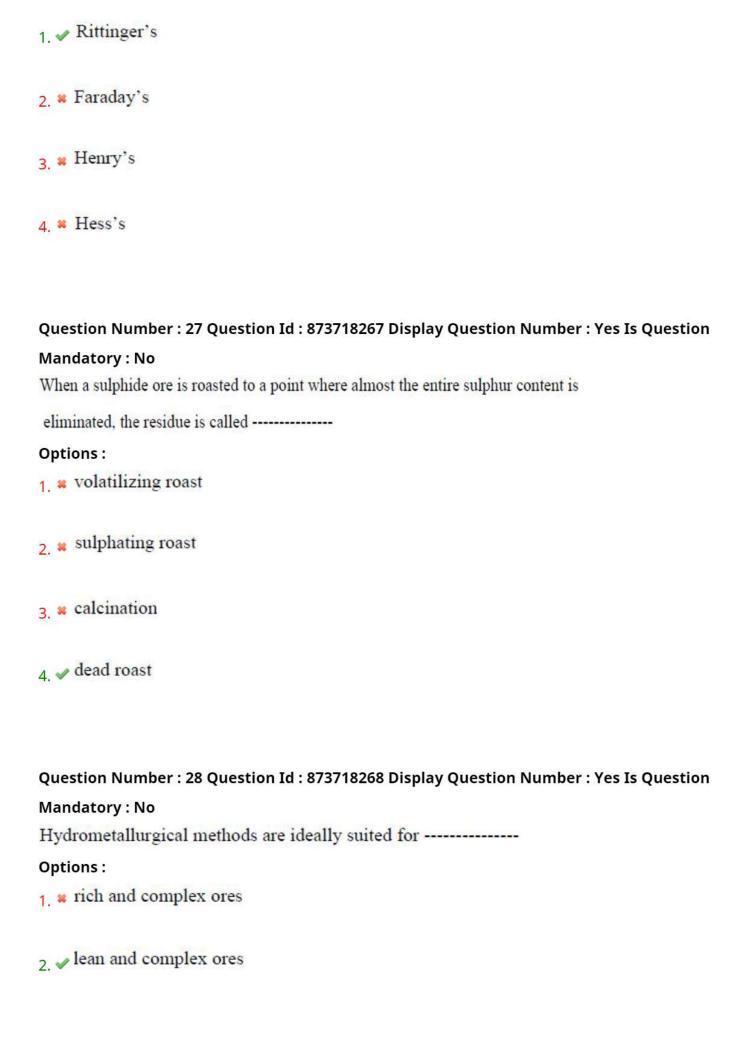
Bernoulli's principle is derived from -----

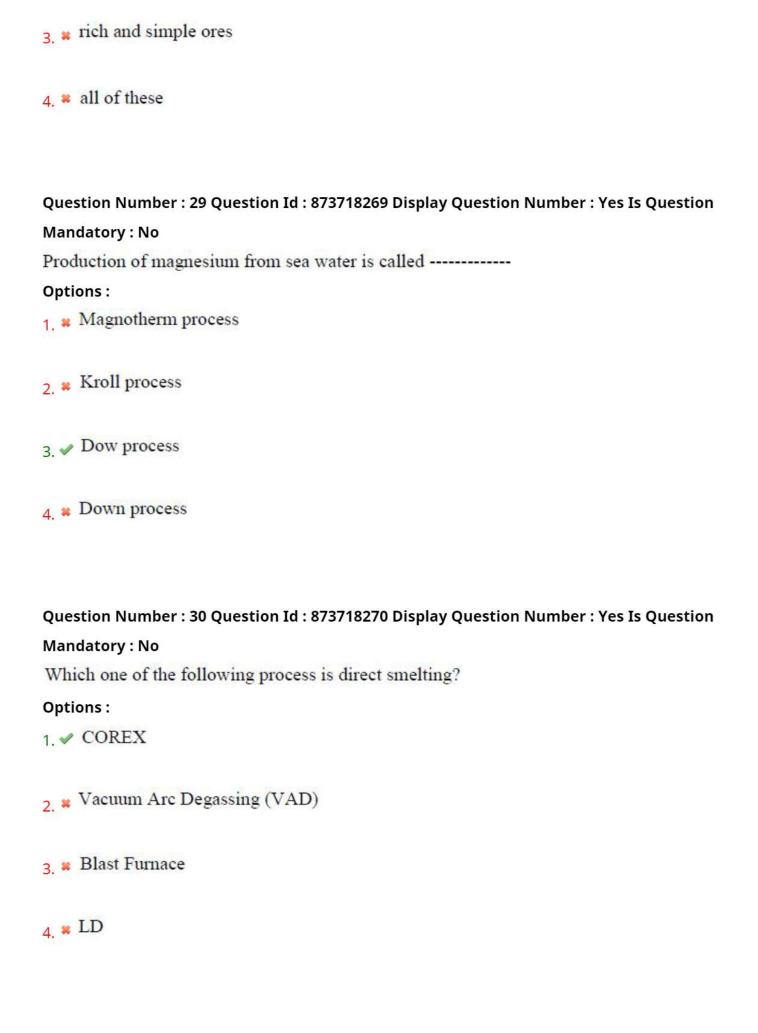
Options:

- 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 : 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?
Ontions:

1. * Roasting - smelting - concentration - converting - refining

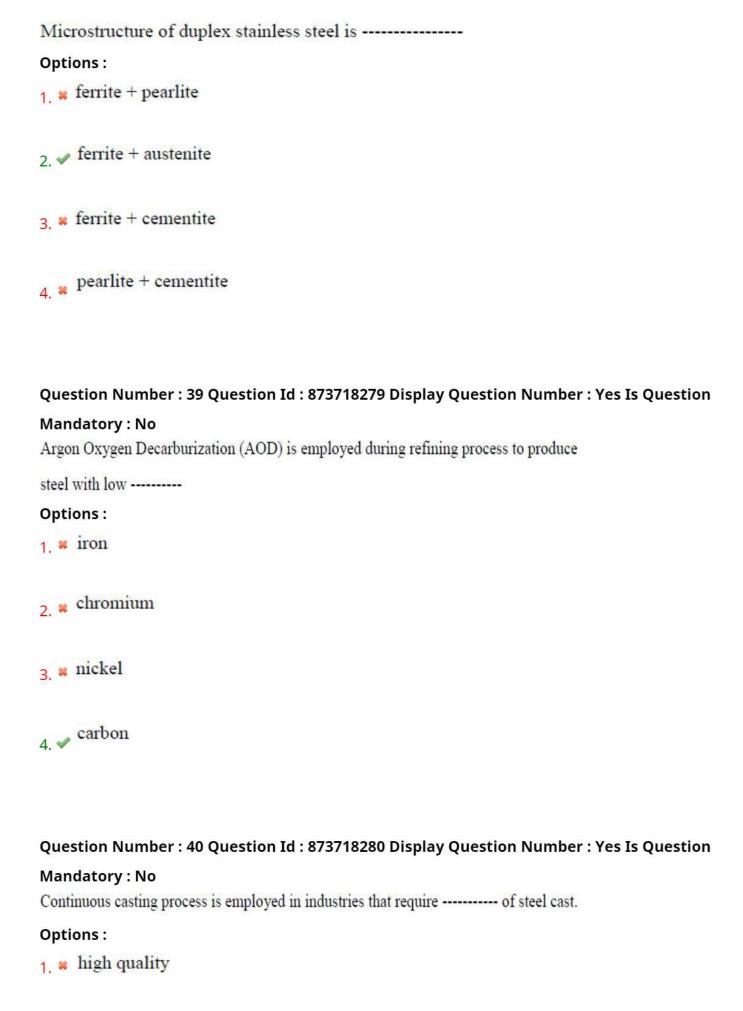
2. * Concentration - smelting - converting - roasting - refining 3 ✓ Concentration – roasting – smelting – converting – refining 4. * Smelting - concentration - Roasting - converting - refining Question Number: 34 Question Id: 873718274 Display Question Number: Yes Is Question Mandatory: No ----- is used for bauxite ore leaching in Bayer process. Options: 1. * Fe₂O₃ 2. * TiO₂ 3. * SiO2 4. V 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

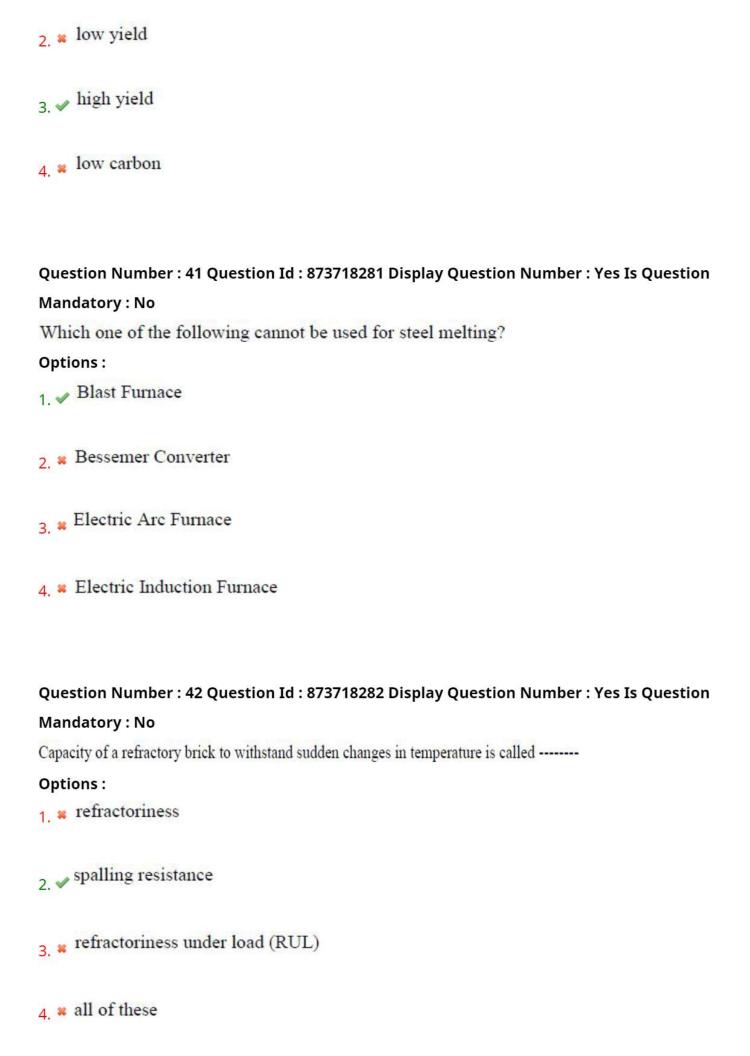
Question Number: 36 Question Id: 873718276 Display Question Number: Yes Is Question Mandatory: No ----- can be used to produce alloy steels. Options: 1. * L D process 2. W Open hearth furnace Electric arc furnace 4 * Acid Bessemer process Question Number: 37 Question Id: 873718277 Display Question Number: Yes Is Question Mandatory: No Which one of the following is main source of sulphur in the blast furnace charge? Options: 1. V Coke 2. W Iron ore 3. * Flux 4. * Scrap

Question Number : 38 Question Id : 873718278 Display Question Number : Yes Is Question

Mandatory: No

4. * Lead



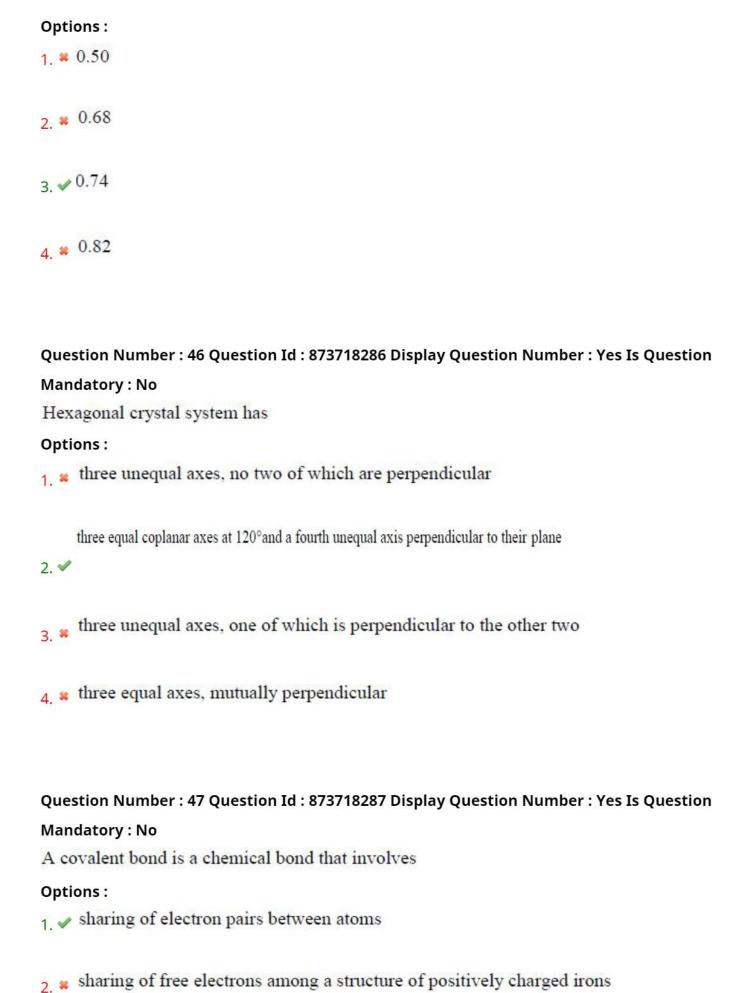


${\bf Question\ Number: 43\ Question\ Id: 873718283\ Display\ Question\ Number: Yes\ Is\ Question}$
Mandatory : No
The heat required to run the ESR process is generated by the in the slag bath.
Options:
1. * Electrode potential
2. * Activation energy
3. * Free energy
4. ✓ Joule effect
Question Number : 44 Question Id : 873718284 Display Question Number : Yes Is Question Mandatory : No
Mandatory : No
Mandatory: No Which among the following is not a factor that leads to macro-segregation in ingots?
Mandatory: No Which among the following is not a factor that leads to macro-segregation in ingots? Options:
Mandatory: No Which among the following is not a factor that leads to macro-segregation in ingots? Options: 1. ✓ Expansion due to mild heating
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

Question Number : 45 Question Id : 873718285 Display Question Number : Yes Is Question

The packing factor for face centered cubic structure is

Mandatory : No



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. whard, 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. verbon 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 w 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. viron 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

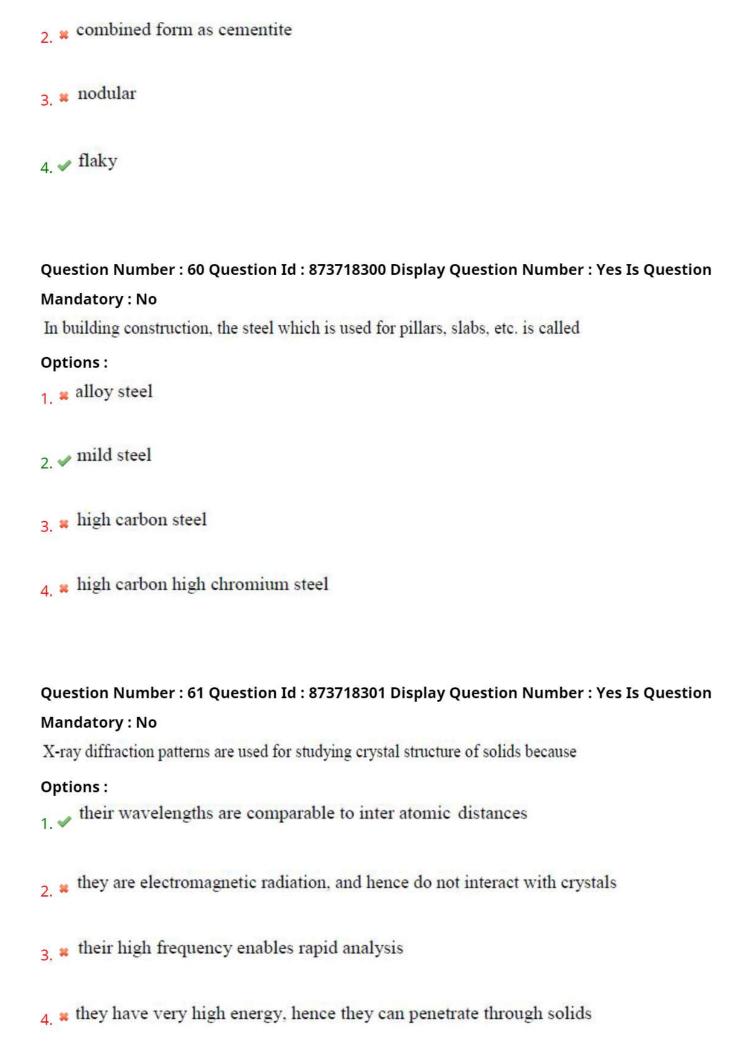
Question Number : 57 Question Id : 873718297 Display Question Number : Yes Is Question

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. W 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

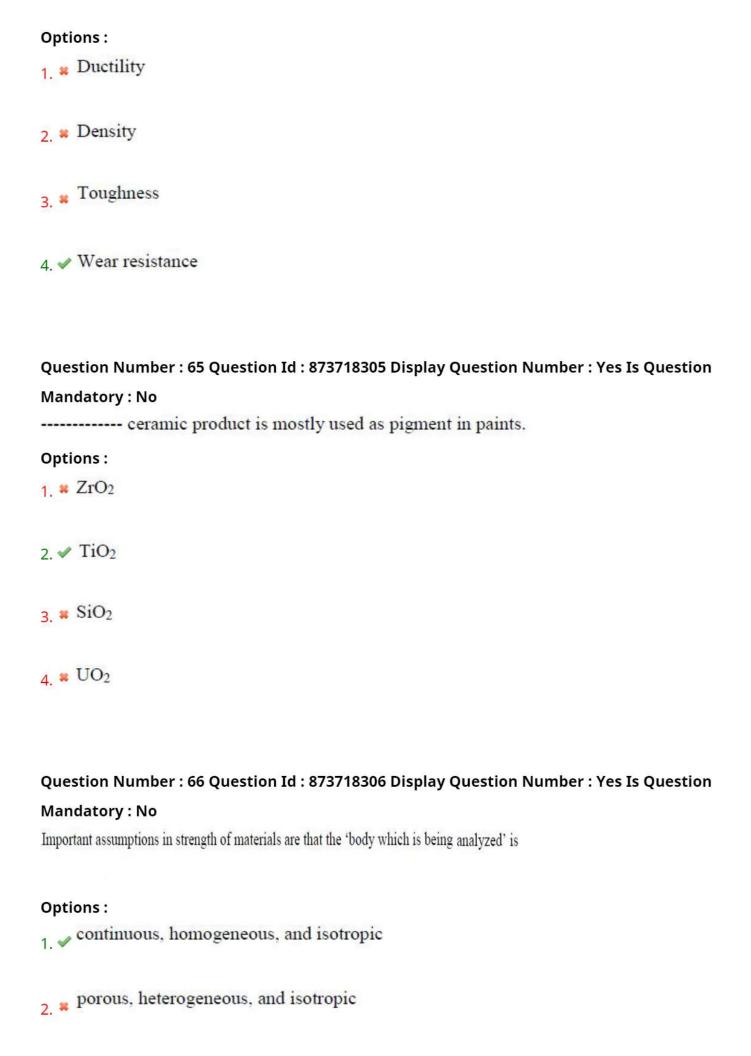


Question Number : 62 Question Id : 873718302 Display Question Number : Yes Is Question
Mandatory : No
Which thermoplastic resin is used for mounting a specimen in metallography?
Options: 1. ** Polycarbonate
1. * Toryearoonate
2. * Acetal copolymer
3. V Lucite
4. Polystyrene
Question Number : 63 Question Id : 873718303 Display Question Number : Yes Is Question
Question Number : 63 Question Id : 873718303 Display Question Number : Yes Is Question Mandatory : No
Mandatory : No
Mandatory: No Which of the following is used in electron microscope?
Mandatory: No Which of the following is used in electron microscope? Options:
Mandatory: No Which of the following is used in electron microscope? Options: 1. ** Electron beams
Mandatory: No Which of the following is used in electron microscope? Options: 1. * Electron beams 2. * Light waves

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

Mandatory : No

Question Number : 64 Question Id : 873718304 Display Question Number : Yes Is Question

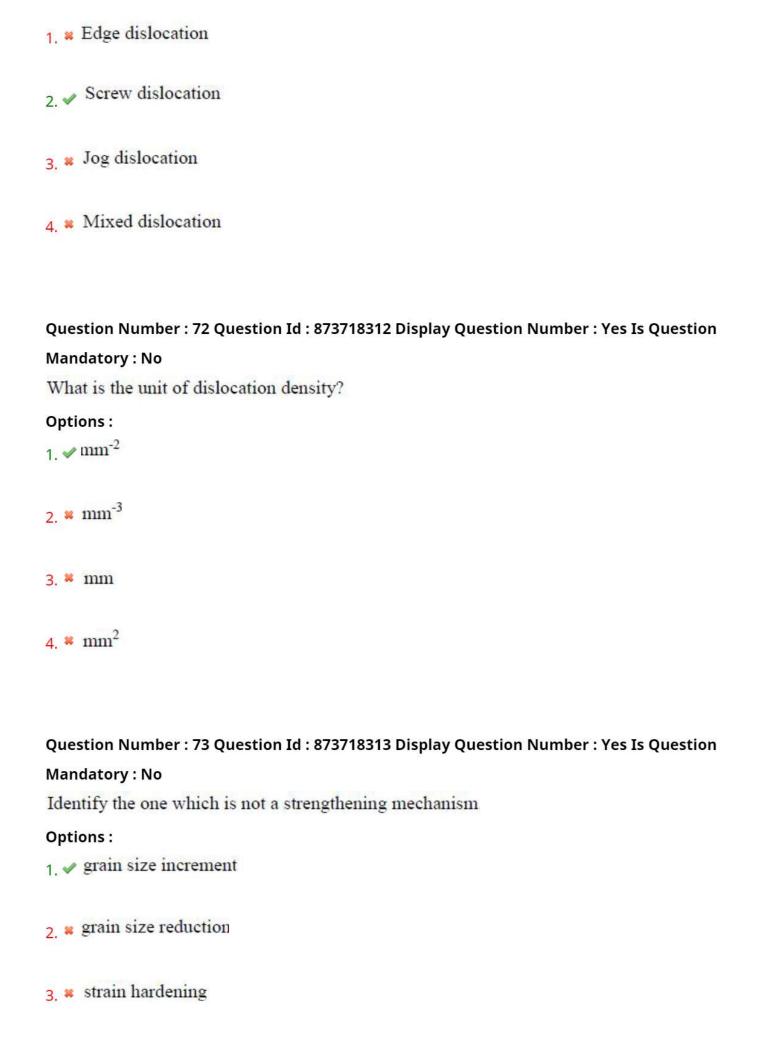


3. * continuous, homogeneous, and anisotropic 4. * discontinuous, homogeneous, and anisotropic Question Number: 67 Question Id: 873718307 Display Question Number: Yes Is Question Mandatory: No Concept of Hooke's law is Options: 1. * pressure is inversely proportional to temperature 2. * pressure is proportional 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. vaverage stress / average strain 3. * average pressure / average temperature 4. * average temperature / average pressure

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. V line defect
3. * plane defect
4. * vacancy
4. * vacancy
4. * Vacancy Question Number: 71 Question Id: 873718311 Display Question Number: Yes Is Question

Options:

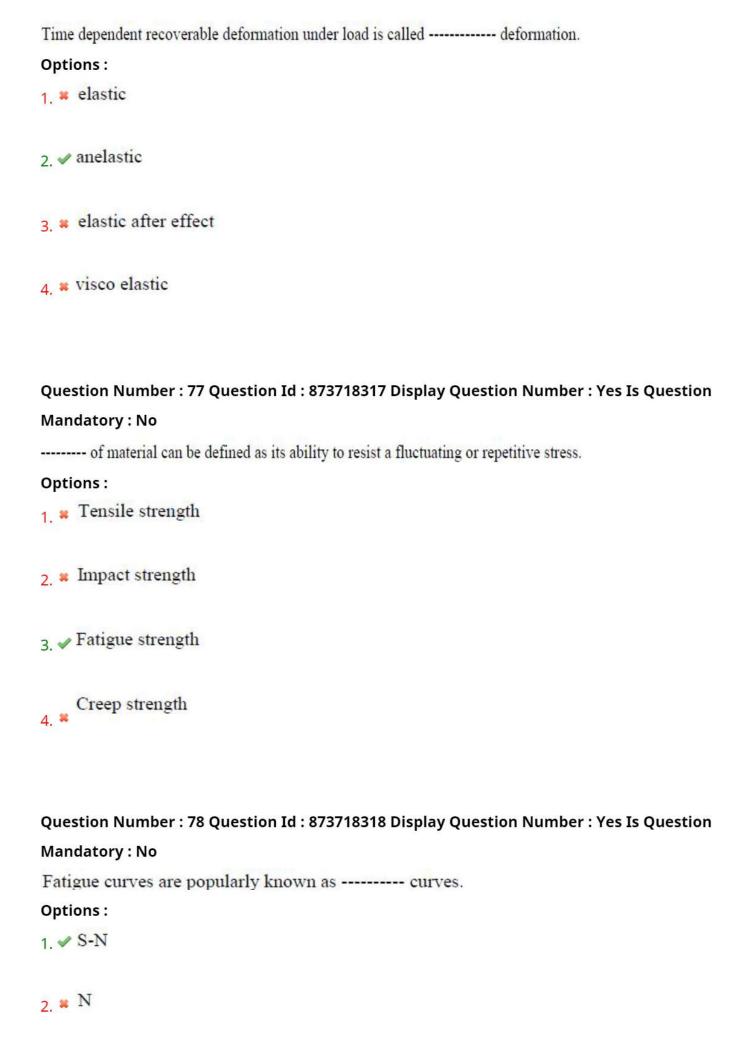
Question Number : 69 Question Id : 873718309 Display Question Number : Yes Is Question

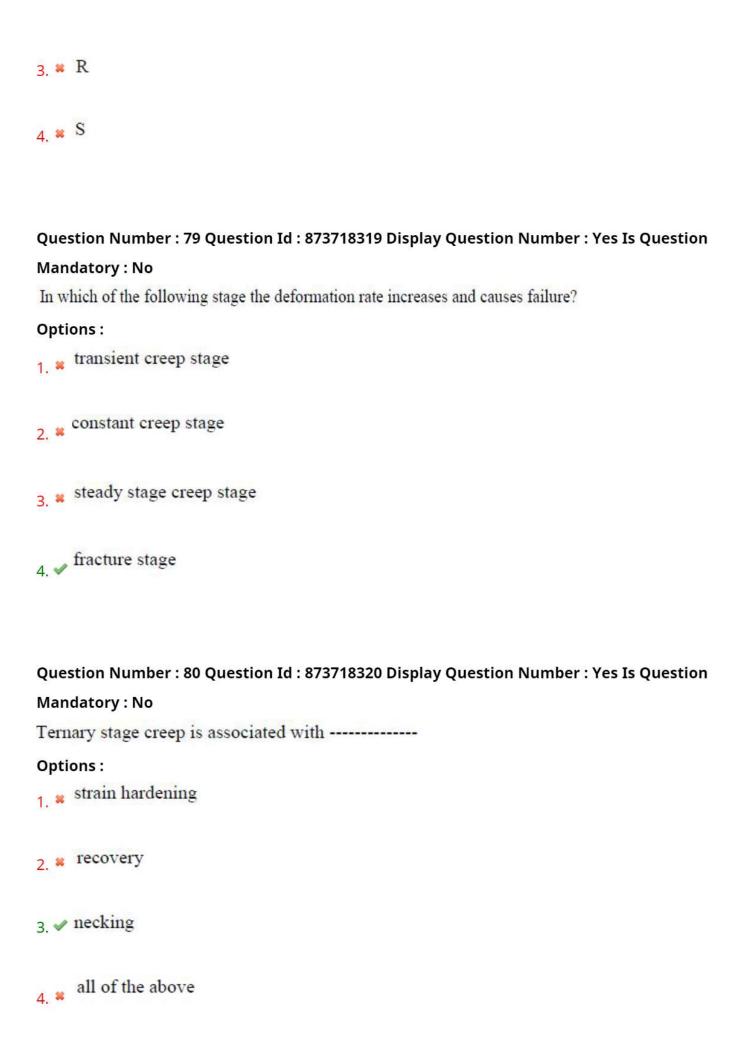


Question Number: 74 Question Id: 873718314 Display Question Number: Yes Is Question Mandatory: No Which of the following is not a way of interaction between solute atoms and dislocations? Options: 1 * stacking fault interaction 2. * modulus interaction 3. plastic interaction 4 * elastic interaction Question 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. w yield point 4. fracture point

4. * solid solution strengthening

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





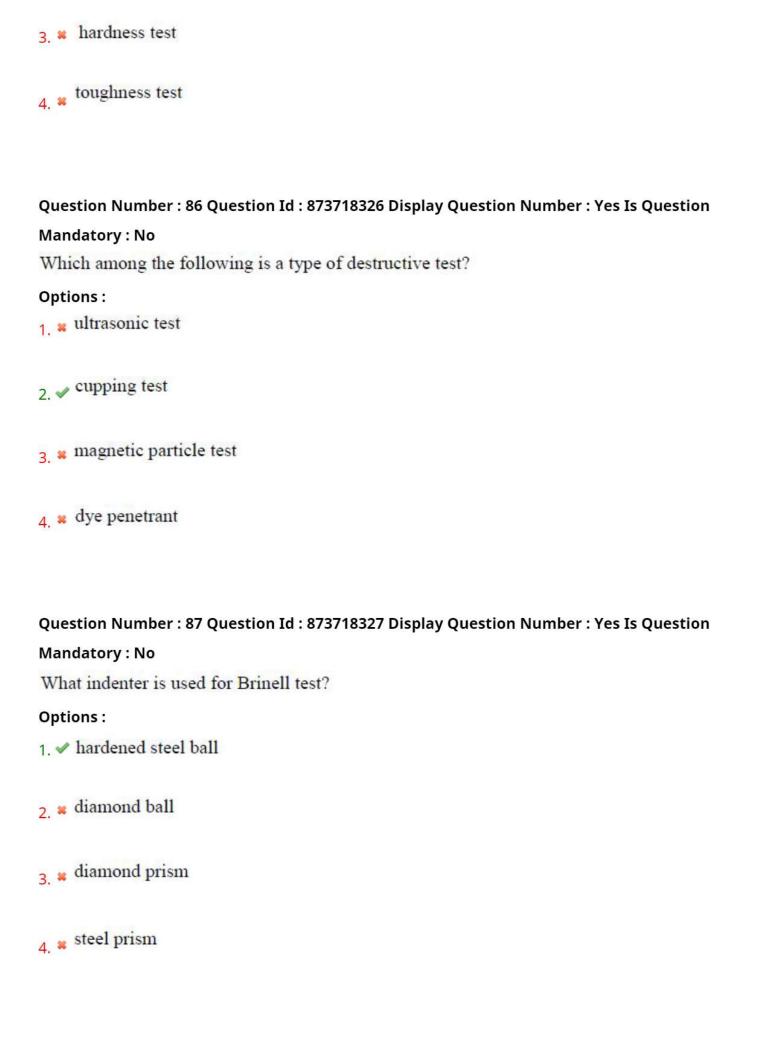
Question Number: 81 Question Id: 873718321 Display Question Number: Yes Is Question Mandatory: No Which of the following part of mechanics deals with study of crack propagation? Options: solid mechanics 2. # fluid mechanics 3. * applied mechanics fracture mechanics Question Number: 82 Question Id: 873718322 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

Question Number : 83 Question Id : 873718323 Display Question Number : Yes Is Question

Mandatory: No

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

What causes brittle fracture?



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
cavity is filled with a precalculated quantity of metal and a core is inserted to force
4. * 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 Questi	on
Mandatory : No	

Which of the following metal forming processes performs squeezing out of material

through a hole?

Options:

- 1. * forging
- 2. * rolling
- 3. vextrusion
- 4. * drawing

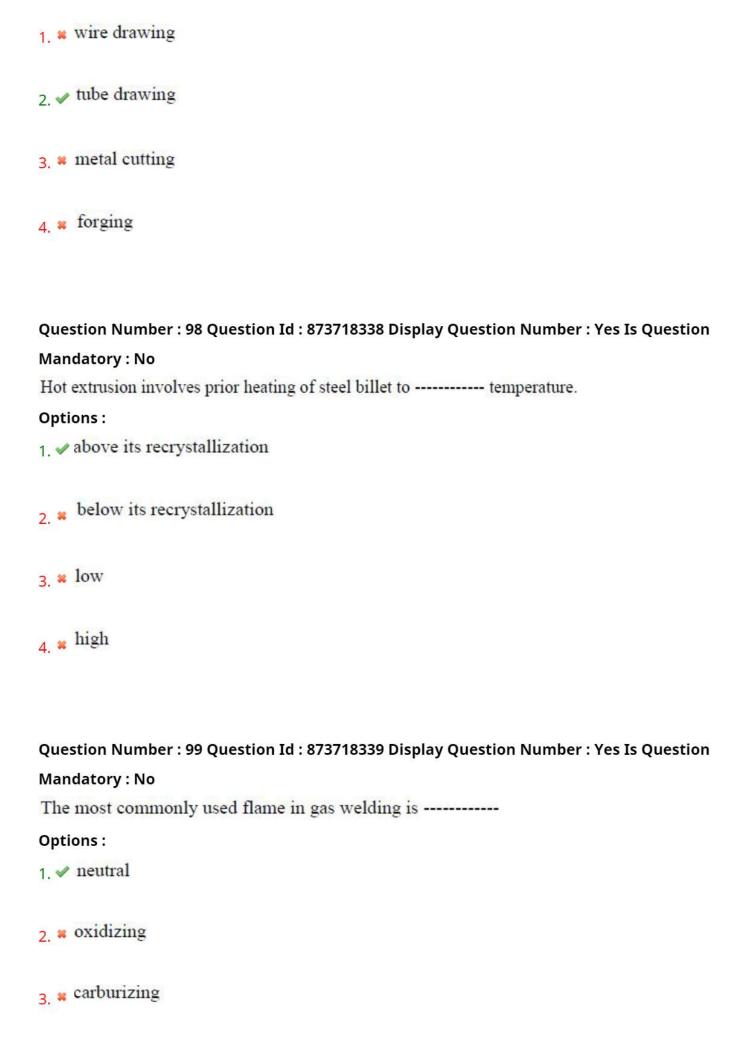
Question Number : 94 Question Id : 873718334 Display Question Number : Yes Is Question

Mandatory : No

What is the best suitable process for making the wires?

- 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
J. ▼
4. * electric wires
4. * Ciccure 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
2.
3. * both cold and hot working processes
3. * both cold and not 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:



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. w 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

4. * all of the above

Question Number: 102 Question Id: 873718342 Display Question Number: Yes Is Question

Mandatory : No
Which of the following equipment is generally used for arc welding?
Options:
1. * single phase alternator
2. * two phase alternator
three phase alternator
4. v 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
2. •
3. * TIG welding
3. **
4. * CIG welding
4. **
Question Number : 104 Question Id : 873718344 Display Question Number : Yes Is Question
Mandatory: No
Pure copper powder can be effectively produced by
Options:
atamination.
1. * atomization

2. * reduction 3. a crushing 4. v 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

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. Wisible 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. W Ultrasonic 3. Dye penetrant 4. * Eddy current

4. * casting

Question Number : 109 Question Id : 873718349 Display Question Number : Yes Is Question

Mandatory: No Non-destructive testing is used to determine Options: 1. a 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. Wltrasonic inspection 3. Magnetic particle inspection 4. Wisual 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
- 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

$$\frac{1}{1.} \checkmark \frac{1}{5} e^{2x}$$

$$\frac{1}{3}e^{2x}$$

$$\frac{1}{17}e^{2x}$$

$$\frac{1}{2}e^{2x}$$

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

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

Options:

Question Number: 114 Question Id: 873718354 Display Question Number: Yes Is Question

Mandatory : No

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

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. V 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]=

$$\frac{1}{27}$$

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.
$$\times$$
 $\lambda_1, \lambda_2, \lambda_3 - - - - - \lambda_n$

$$2.$$
 $\sqrt{\lambda_1^2, \lambda_2^2, \lambda_3^2 - - - - \lambda_n^2}$

$$\lambda_1^3, \lambda_2^3, \lambda_3^3 - - - - \lambda_n^3$$

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

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

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

$$\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}$$

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

$$f(z)$$
 is analytic everywhere

$$f(z)$$
 is not analytic at any point