

# Telangana State Council 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.

<b>Question Paper Name :</b>	Metallurgical Engineering 21st Sept 2020 Shift 2
<b>Subject Name :</b>	Metallurgical Engineering
<b>Creation Date :</b>	2020-09-21 17:46:58
<b>Duration :</b>	120
<b>Total Marks :</b>	120
<b>Display Marks:</b>	No
<b>Share Answer Key With Delivery Engine :</b>	Yes
<b>Actual Answer Key :</b>	Yes
<b>Calculator :</b>	None
<b>Magnifying Glass Required? :</b>	No
<b>Ruler Required? :</b>	No
<b>Eraser Required? :</b>	No
<b>Scratch Pad Required? :</b>	No
<b>Rough Sketch/Notepad Required? :</b>	No
<b>Protractor Required? :</b>	No
<b>Show Watermark on Console? :</b>	Yes
<b>Highlighter :</b>	No
<b>Auto Save on Console? :</b>	Yes

## Metallurgical Engineering

<b>Group Number :</b>	1
<b>Group Id :</b>	88039685
<b>Group Maximum Duration :</b>	0

<b>Group Minimum Duration :</b>	120
<b>Show Attended Group? :</b>	No
<b>Edit Attended Group? :</b>	No
<b>Break time :</b>	0
<b>Group Marks :</b>	120
<b>Is this Group for Examiner? :</b>	No

## Mathematics

<b>Section Id :</b>	880396155
<b>Section Number :</b>	1
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	10
<b>Number of Questions to be attempted :</b>	10
<b>Section Marks :</b>	10
<b>Display Number Panel :</b>	Yes
<b>Group All Questions :</b>	Yes
<b>Mark As Answered Required? :</b>	Yes
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	880396155
<b>Question Shuffling Allowed :</b>	Yes

**Question Number : 1 Question Id : 88039610081 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

If the particular integral of  $y''' - y'' = x^2$  is  $-\frac{1}{12}f(x)$ , then  $f(x) =$

**Options :**

88039640321. ✓  $x^4 + 4x^3 + 12x^2$

88039640322. ✘  $x^4 - 4x^3$

88039640323. ✘  $x^4 + 4x^3$

88039640324. ✘  $x^4 + x^3 - 12x^2$

**Question Number : 2 Question Id : 88039610082 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The solution of  $y''+2y'+y = x$  satisfying  $y(0) = y'(0) = 1$  is  $y(x) =$

**Options :**

88039640325. ✔  $x + 3e^{-x}(x+1) - 2$

88039640326. ✘  $x - 3e^{-x}(x+1) + 2$

88039640327. ✘  $x + 3e^{-x}(x+1) + 2$

88039640328. ✘  $x + 3e^{-x}(x+1) - 3$

**Question Number : 3 Question Id : 88039610083 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The only positive eigen value of  $\begin{pmatrix} 1 & -5 & 8 \\ 1 & -2 & 1 \\ 2 & -1 & -5 \end{pmatrix}$  is

Options :

88039640329. ✖ 3

88039640330. ✖ 2

88039640331. ✔ 1

88039640332. ✖ 4

Question Number : 4 Question Id : 88039610084 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$$A = \begin{pmatrix} 1 & -5 & 0 \\ 1 & -1 & 1 \\ 2 & -1 & 0 \end{pmatrix} \Rightarrow A^4 + 5A^2 =$$

Options :

88039640333. ✖ 9A

88039640334. ✔ - 9A

88039640335. ✖ 8A

88039640336. ✖ - 8A

Question Number : 5 Question Id : 88039610085 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The value of 'k' for which the following system has infinitely many solutions is

$$3x - 2y + z = -3, x + 5y + 2z = 4, 4x + 3y + 3z = k$$

Options :

88039640337. ✓ 1

88039640338. ✗ 2

88039640339. ✗ 3

88039640340. ✗ 4

Question Number : 6 Question Id : 88039610086 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Curl of  $(x - 2y, \cos xy, z^2 - x)$  is

Options :

88039640341. ✗  $(0, -1, 2 - y \sin xy)$

88039640342. ✓  $(0, 1, 2 - y \sin xy)$

88039640343. ✗  $(0, 1, 2 + y \sin xy)$

88039640344. ✗  $(0, -1, 2 + y \sin xy)$

Question Number : 7 Question Id : 88039610087 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The number of critical points of  $f(x, y) = x^4 - 16xy + y^4$  is

Options :

88039640345. ✘ 1

88039640346. ✘ 2

88039640347. ✔ 3

88039640348. ✘ 4

Question Number : 8 Question Id : 88039610088 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For  $k > 1$ , the series  $1 + \frac{2}{k} + \frac{3}{k^2} + \frac{4}{k^3} + \dots$  converges to

Options :

88039640349. ✔  $\frac{k^2}{(k-1)^2}$

88039640350. ✘  $\frac{(k-1)^2}{k}$

88039640351. ✘  $\frac{(k+1)^2}{k}$

88039640352. ✘  $\frac{k^2}{(k+1)^2}$

**Question Number : 9 Question Id : 88039610089 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

From the set  $\{1, 2, 3, \dots, 40\}$  two numbers  $a, b$  are drawn at random. The probability that  $a, b$  are both primes which differ by 2 is

**Options :**

88039640353. ✘  $\frac{1}{8}$

88039640354. ✔  $\frac{1}{156}$

88039640355. ✘  $\frac{1}{10}$

88039640356. ✘  $\frac{1}{160}$

Question Number : 10 Question Id : 88039610090 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The probability distribution of a random variable X is as follows :

$x$	1	2	3	4	5	6
$P(X=x)$	$6k$	$5k$	$4k$	$3k$	$2k$	$k$

Then the mean of the distribution is

Options :

88039640357. ✘  $\frac{4}{3}$

88039640358. ✘  $\frac{5}{3}$

88039640359. ✔  $\frac{7}{3}$

88039640360. ✘  $\frac{8}{3}$

## Metallurgical Engineering

Section Id :

880396156

Section Number :

2

Section type :

Online

Mandatory or Optional :

Mandatory



**Number of Questions :** 110  
**Number of Questions to be attempted :** 110  
**Section Marks :** 110  
**Display Number Panel :** Yes  
**Group All Questions :** Yes  
**Mark As Answered Required? :** Yes  
**Sub-Section Number :** 1  
**Sub-Section Id :** 880396156  
**Question Shuffling Allowed :** Yes

**Question Number : 11 Question Id : 88039610091 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Which of the following thermodynamic quantity is a path function?

**Options :**

88039640361. ✘ Entropy

88039640362. ✘ Volume

88039640363. ✘ Gibbs free energy

88039640364. ✔ Heat

**Question Number : 12 Question Id : 88039610092 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Activity coefficient of component B in solution A-B, exhibiting positive deviation from ideal behavior will be

**Options :**

88039640365. ✓  $> 1$

88039640366. ✗ 1

88039640367. ✗  $< 0$

88039640368. ✗ Between 0 and 1

**Question Number : 13 Question Id : 88039610093 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

During casting, which section should solidify at last

**Options :**

88039640369. ✗ Sprue

88039640370. ✗ Casting Gate

88039640371. ✗ Runner

88039640372. ✓ Riser

**Question Number : 14 Question Id : 88039610094 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Volumetric thermal expansion coefficient of a material is given by

Options :

88039640373. ✘  $-\frac{1}{V} \left( \frac{dV}{dT} \right)_p$

88039640374. ✘  $-\frac{1}{V} \left( \frac{dV}{dp} \right)_T$

88039640375. ✔  $\frac{1}{V} \left( \frac{dV}{dT} \right)_p$

88039640376. ✘  $\frac{1}{p} \left( \frac{dV}{dT} \right)_p$

Question Number : 15 Question Id : 88039610095 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which of the following can be regarded as an Equation of State?

Options :

88039640377. ✘  $U = f(S, V)$

88039640378. ✔  $P = f(V, T)$

88039640379. ✘  $G = f(p, T)$

88039640380. ✘  $H = f(S, p)$

Question Number : 16 Question Id : 88039610096 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Maximum number of phases that can co-exist in a ternary system at constant pressure and temperature is

Options :

88039640381. ✘ 2

88039640382. ✘ 5

88039640383. ✘ 4

88039640384. ✔ 3

Question Number : 17 Question Id : 88039610097 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

According to parabolic rate law, thickness of the oxide layer ( $x$ ) growing on a metal surface will have the following dependence on time ( $t$ )

Options :

88039640385. ✘  $x \propto t$

88039640386. ✘  $x \propto t^2$

88039640387. ✔  $x \propto t^{0.5}$

88039640388. ✘  $x \propto \frac{1}{t}$

Question Number : 18 Question Id : 88039610098 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The dimension of diffusion coefficient is given by

Options :

88039640389. ✓  $L^2T^{-1}$

88039640390. ✗  $LT^{-1}$

88039640391. ✗  $MLT^{-2}$

88039640392. ✗  $ML^{-2}T$

Question Number : 19 Question Id : 88039610099 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The potential of a galvanic cell of copper (potential of +0.34 V) and aluminium (potential of -1.66 V) is

Options :

88039640393. ✗ -1.32 V

88039640394. ✗ 1.32 V

88039640395. ✗ 0.0 V

88039640396. ✓ 2.0 V

Question Number : 20 Question Id : 88039610100 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

SI unit of kinematic viscosity is

Options :

88039640397. ✓  $\text{m}^2 \text{s}^{-1}$

88039640398. ✗  $\text{m s}^{-1}$

88039640399. ✗  $\text{m s}^2$

88039640400. ✗  $\text{m s}$

Question Number : 21 Question Id : 88039610101 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which of the following metals is electrochemically most active?

Options :

88039640401. ✗ Aluminum

88039640402. ✗ Iron

88039640403. ✓ Magnesium

88039640404. ✗ Titanium

**Question Number : 22 Question Id : 88039610102 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

In electrochemical corrosion, \_\_\_\_\_ reactions take place at cathode.

**Options :**

88039640405. ✘ Oxidation

88039640406. ✔ Reduction

88039640407. ✘ Both oxidation and reduction

88039640408. ✘ Neither oxidation nor reduction

**Question Number : 23 Question Id : 88039610103 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The brazing process is carried in the temperature range of

**Options :**

88039640409. ✘ 150 - 250°C

88039640410. ✘ 250 - 450°C

88039640411. ✘ 500- 700°C

88039640412. ✔ 700- 900°C

**Question Number : 24 Question Id : 88039610104 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following can provide cathodic protection to iron?

**Options :**

88039640413. ✘ Copper

88039640414. ✔ Zinc

88039640415. ✘ Nickel

88039640416. ✘ Chromium

**Question Number : 25 Question Id : 88039610105 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Corrosion resistance of steel is increased by adding

**Options :**

88039640417. ✘ Nickel and molybdenum

88039640418. ✔ Chromium and nickel

88039640419. ✘ Aluminum and zinc

88039640420. ✘ Aluminum and boron



**Question Number : 26 Question Id : 88039610106 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In austenitic stainless steels, sensitization leads to

**Options :**

88039640421. ✓ Intergranular corrosion

88039640422. ✗ Transgranular corrosion

88039640423. ✗ Pitting corrosion

88039640424. ✗ Crevice corrosion

**Question Number : 27 Question Id : 88039610107 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The hot metal charged into a basic oxygen furnace typically contains \_\_\_\_\_ wt.% of carbon.

**Options :**

88039640425. ✗ Less than 1.5

88039640426. ✗ 1.5 to 2.5

88039640427. ✓ 3.5 to 4.5

88039640428. ✗ 5.5 to 6.5

**Question Number : 28 Question Id : 88039610108 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In Blast furnace-Basic oxygen furnace (BF-BOF) steelmaking, the main source of sulfur is

**Options :**

88039640429. ✘ Iron ore

88039640430. ✘ Sinter

88039640431. ✔ Coke

88039640432. ✘ Steel scrap

**Question Number : 29 Question Id : 88039610109 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Steelmaking is

**Options :**

88039640433. ✔ An oxidation process

88039640434. ✘ A reduction process

88039640435. ✘ A calcination process

88039640436. ✘ A roasting process

**Question Number : 30 Question Id : 88039610110 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

----- is added to prevent harmful FeS formation in steels.

**Options :**

88039640437. ✘ Aluminum

88039640438. ✔ Manganese

88039640439. ✘ Nickel

88039640440. ✘ Copper

**Question Number : 31 Question Id : 88039610111 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In steelmaking, effective desulfurization of hot metal requires that the slag is

**Options :**

88039640441. ✔ Reducing and basic

88039640442. ✘ Oxidizing and basic

88039640443. ✘ Reducing and acidic

88039640444. ✘ Reducing and neutral

**Question Number : 32 Question Id : 88039610112 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Matte smelting is used in the extraction of

**Options :**

88039640445. ✘ Nickel

88039640446. ✘ Aluminum

88039640447. ✔ Copper

88039640448. ✘ Magnesium

**Question Number : 33 Question Id : 88039610113 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

In Kroll's process,  $TiCl_4$  is reduced to titanium metal using

**Options :**

88039640449. ✘ Sodium

88039640450. ✔ Magnesium

88039640451. ✘ Cerium

88039640452. ✘ Zirconium

**Question Number : 34 Question Id : 88039610114 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Correct Marks : 1 Wrong Marks : 0

In Hall-Heroult's process, alumina is dissolved in

Options :

88039640453. ✘ Molten chromite

88039640454. ✘ Molten cuprite

88039640455. ✔ Molten cryolite

88039640456. ✘ Molten rutile

Question Number : 35 Question Id : 88039610115 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Hardness of martensite in steels increases with

Options :

88039640457. ✔ Increase in carbon content

88039640458. ✘ Increase in cooling rate

88039640459. ✘ Increase in martensite-start ( $m_s$ ) temperature

88039640460. ✘ Decrease in austenitization temperature

Question Number : 36 Question Id : 88039610116 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Critical value of the Gibbs energy of nucleation at equilibrium temperature is

Options :

88039640461. ✘ Zero

88039640462. ✔ Infinite

88039640463. ✘ Positive

88039640464. ✘ Negative

Question Number : 37 Question Id : 88039610117 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In which of the following does most unsteady heat flow occurs

Options :

88039640465. ✘ Walls of refrigerator

88039640466. ✔ Annealing of castings

88039640467. ✘ Walls of furnace

88039640468. ✘ Through lagged pipes carrying steam

Question Number : 38 Question Id : 88039610118 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Annealing produces a microstructure consisting of pearlite + proeutectoid cementite in \_\_\_\_\_ steels.

Options :

88039640469. ✘ Hypoeutectoid

88039640470. ✔ Hypereutectoid

88039640471. ✘ Eutectoid

88039640472. ✘ Interstitial-free

Question Number : 39 Question Id : 88039610119 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which of the following binary systems is isomorphous?

Options :

88039640473. ✘ Fe-Cu

88039640474. ✔ Cu-Ni

88039640475. ✘ Al-Cu

88039640476. ✘ Ni-Ti

Question Number : 40 Question Id : 88039610120 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is



**Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Lever rule is used for

**Options :**

88039640477. ✓ Determining the amounts of phases that exist in equilibrium at a given temperature
88039640478. ✘ Determining the compositions of phases that exist in equilibrium at a given temperature
88039640479. ✘ Determining the temperature at which a given phase transformation can occur
88039640480. ✘ Determining the critical cooling rate for a given phase transformation can take place

**Question Number : 41 Question Id : 88039610121 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is**

**Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is true as per Hume-Rothery rules?

**Options :**

88039640481. ✘ Metals with a large difference in atomic size exhibit extended solid solubility
88039640482. ✘ Metals with widely different electronegativities exhibit extended solid solubility
88039640483. ✘ A metal is more likely to dissolve a solute of lower valency than a solute of higher valency



A metal is more likely to dissolve a solute of higher valency than a solute of lower valency

88039640484. ✓

**Question Number : 42 Question Id : 88039610122 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

In naturally aged Al-Cu alloys, strengthening is due to

**Options :**

88039640485. ✓ Guinier – Preston zones

88039640486. ✗ Semi-coherent  $\text{Al}_2\text{Cu}$  ( $\theta$ ) precipitates

88039640487. ✗ Coherent  $\text{Al}_2\text{Cu}$  ( $\theta$ ) precipitates

88039640488. ✗ Incoherent  $\text{Al}_2\text{Cu}$  ( $\theta$ ) particles

**Question Number : 43 Question Id : 88039610123 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

In titanium alloys, \_\_\_\_\_ is an alpha stabilizer.

**Options :**

88039640489. ✓ Aluminum

88039640490. ✗ Vanadium

88039640491. ✗ Niobium

88039640492. ✘ Molybdenum

Question Number : 44 Question Id : 88039610124 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which of the following is not a precipitation-hardenable aluminum alloy?

Options :

88039640493. ✘ Al-Cu

88039640494. ✘ Al-Zn-Mg

88039640495. ✔ Al-Mn

88039640496. ✘ Al-Mg-Si

Question Number : 45 Question Id : 88039610125 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is the major alloying element in phosphor bronze?

Options :

88039640497. ✘ Zinc

88039640498. ✔ Tin

88039640499. ✘ Phosphorus

88039640500. ✘ Aluminum

**Question Number : 46 Question Id : 88039610126 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ alloys are precipitation hardenable.

**Options :**

88039640501. ✔ Cu-Be

88039640502. ✘ Cu-Zn

88039640503. ✘ Cu-Sn

88039640504. ✘ Cu-Al

**Question Number : 47 Question Id : 88039610127 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ is not a gamma stabilizer in iron.

**Options :**

88039640505. ✘ Carbon

88039640506. ✘ Nitrogen

88039640507. ✔ Chromium

88039640508. ✘ Nickel

**Question Number : 48 Question Id : 88039610128 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

What is the main alloying element in transformer steels?

**Options :**

88039640509. ✘ Manganese

88039640510. ✔ Silicon

88039640511. ✘ Chromium

88039640512. ✘ Nickel

**Question Number : 49 Question Id : 88039610129 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In regenerator type heat exchanger, heat transfer takes place by

**Options :**

88039640513. ✘ Direct mixing of hot and cold fluids

88039640514. ✘ Complete separation between hot and cold fluids

88039640515. ✔ Flow of hot and cold fluids alternately over a surface

88039640516. ✘ Generation of heat again and again

**Question Number : 50 Question Id : 88039610130 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Which of the following is most machinable?

**Options :**

88039640517. ✓ Gray cast iron

88039640518. ✗ Nodular cast iron

88039640519. ✗ White cast iron

88039640520. ✗ Malleable cast iron

**Question Number : 51 Question Id : 88039610131 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ is used in the production of ductile iron for nodularizing the graphite.

**Options :**

88039640521. ✗ Sodium

88039640522. ✗ Aluminum

88039640523. ✓ Magnesium

88039640524. ✗ Manganese

**Question Number : 52 Question Id : 88039610132 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Micro-segregation of alloying elements during solidification can be minimized by

**Options :**

- 88039640525. ✘ Reducing the cooling rate during solidification
- 88039640526. ✔ Increasing the cooling rate during solidification
- 88039640527. ✘ Addition of inoculants to the melt
- 88039640528. ✘ Vigorous stirring of the melt before casting

**Question Number : 53 Question Id : 88039610133 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The property of a material that cannot be significantly changed by heat treatment

**Options :**

- 88039640529. ✘ Yield Strength
- 88039640530. ✘ Ultimate tensile strength
- 88039640531. ✘ Ductility
- 88039640532. ✔ Elastic modulus

**Question Number : 54 Question Id : 88039610134 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

What is the preferred crystallographic direction for dendritic growth in face-centered cubic metals?

**Options :**

88039640533. ✓  $\langle 100 \rangle$

88039640534. ✗  $\langle 111 \rangle$

88039640535. ✗  $\langle 110 \rangle$

88039640536. ✗  $\langle 1010 \rangle$

**Question Number : 55 Question Id : 88039610135 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Which of the following is a planar defect?

**Options :**

88039640537. ✗ Vacancy

88039640538. ✗ Dislocation

88039640539. ✓ Stacking fault

88039640540. ✗ Substitutional impurity atom

**Question Number : 56 Question Id : 88039610136 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is**



**Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is true?

**Options :**

88039640541. ✓ The equilibrium vacancy concentration in metals increases with increase in temperature

88039640542. ✗ The equilibrium vacancy concentration in metals decreases with increase in temperature

88039640543. ✗ The equilibrium vacancy concentration in metals does not change with temperature

88039640544. ✗ There is no such thing as equilibrium vacancy concentration in metals

**Question Number : 57 Question Id : 88039610137 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is**

**Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ is not a substitutional solute in iron.

**Options :**

88039640545. ✗ Silicon

88039640546. ✗ Manganese

88039640547. ✗ Nickel

88039640548. ✓ Carbon



**Question Number : 58 Question Id : 88039610138 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The fastest diffusing species in Fe is

**Options :**

88039640549. ✓ Hydrogen

88039640550. ✗ Nickel

88039640551. ✗ Carbon

88039640552. ✗ Tungsten

**Question Number : 59 Question Id : 88039610139 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Microstructure of maraging steels consists of

**Options :**

88039640553. ✗ Bainite and Ferrite

88039640554. ✗ Bainite and Pearlite

88039640555. ✓ Lath Martensite

88039640556. ✗ Plate Martensite

**Question Number : 60 Question Id : 88039610140 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Microstructure of upper Bainite is characterized by

**Options :**

- 88039640557. ✓ Presence of carbides only at the ferrite lath boundaries
- 88039640558. ✗ Presence of carbides only within the ferrite laths
- 88039640559. ✗ Presence of carbides both within and at the boundaries of ferrite laths
- 88039640560. ✗ Absence of carbides

**Question Number : 61 Question Id : 88039610141 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

All the three modes of heat transmission are involved in

**Options :**

- 88039640561. ✗ Melting of ice
- 88039640562. ✗ Cooling of small metal casting in a quenching bath
- 88039640563. ✗ Heat flow through the walls of a refrigerator
- 88039640564. ✓ Automobile engine equipped with a thermo-siphon cooling system

Question Number : 62 Question Id : 88039610142 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

During overaging of steels, hardness

Options :

88039640565. ✓ Decreases

88039640566. ✗ Increases

88039640567. ✗ Is constant

88039640568. ✗ Increases abruptly

Question Number : 63 Question Id : 88039610143 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

When using back-scattered electrons for imaging in scanning electron microscopy, the phases containing higher amounts of high atomic number elements appear

Options :

88039640569. ✗ Darker

88039640570. ✓ Brighter

88039640571. ✗ Reddish

88039640572. ✗ Greenish

**Question Number : 64 Question Id : 88039610144 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following techniques can be used for identifying the phases present in a material?

**Options :**

88039640573. ✓ X-ray diffraction

88039640574. ✗ Scanning electron microscopy

88039640575. ✗ Differential scanning calorimetry

88039640576. ✗ Thermogravimetric analysis

**Question Number : 65 Question Id : 88039610145 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Antioch process is a

**Options :**

88039640577. ✓ Process of making porous moulds

88039640578. ✗ Continuous casting process

88039640579. ✗ Brazing process

88039640580. ✗ Welding process

**Question Number : 66 Question Id : 88039610146 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Inclusion rating of steels is best carried out

**Options :**

88039640581. ✘ After Nital etch

88039640582. ✘ After Picral etch

88039640583. ✘ After Keller's etch

88039640584. ✔ In as-polished condition

**Question Number : 67 Question Id : 88039610147 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Surface of steel cannot be hardened by

**Options :**

88039640585. ✘ Carburizing

88039640586. ✘ Nitriding

88039640587. ✘ Flame hardening

88039640588. ✔ Phosphating

**Question Number : 68 Question Id : 88039610148 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ is commonly used for positive material identification in industry.

**Options :**

88039640589. ✓ X-ray fluorescence

88039640590. ✗ Energy dispersive spectroscopy

88039640591. ✗ Wavelength dispersive spectroscopy

88039640592. ✗ Fourier-transform infrared spectroscopy

**Question Number : 69 Question Id : 88039610149 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The principle of heating in induction furnace is

**Options :**

88039640593. ✗ High resistance elements

88039640594. ✓ Eddy Currents

88039640595. ✗ Direct fuel burning

88039640596. ✗ Heating with spark

**Question Number : 70 Question Id : 88039610150 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Water pipes of large length and diameter are made by

**Options :**

88039640597. ✘ Semi-centrifugal casting

88039640598. ✔ Continuous casting

88039640599. ✘ Sand casting

88039640600. ✘ Electric resistance welding

**Question Number : 71 Question Id : 88039610151 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ can be used for texture analysis of a metallic sample.

**Options :**

88039640601. ✘ Optical microscopy

88039640602. ✘ Scanning electron microscopy

88039640603. ✘ Transmission electron microscopy

88039640604. ✔ Electron back-scattered diffraction



Question Number : 72 Question Id : 88039610152 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

ASTM grain size number (n) is related to the number of grains (N) that one can count at 100X magnification by

Options :

88039640605. ✓  $N = 2^{(n-1)}$

88039640606. ✗  $N = 2^{(n+1)}$

88039640607. ✗  $N = 100^{(n-1)}$

88039640608. ✗  $N = 100^{(n+1)}$

Question Number : 73 Question Id : 88039610153 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ polymers do not soften upon heating.

Options :

88039640609. ✗ Thermoplastic

88039640610. ✓ Thermosetting

88039640611. ✗ Crystalline

88039640612. ✗ Elastomeric



**Question Number : 74 Question Id : 88039610154 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ is used as a thermal barrier coating on aeroengine components.

**Options :**

88039640613. ✘ Alumina

88039640614. ✔ Zirconia

88039640615. ✘ Magnesita

88039640616. ✘ Silica

**Question Number : 75 Question Id : 88039610155 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ can simultaneously increase the strength and ductility of a metallic material.

**Options :**

88039640617. ✘ Precipitation hardening

88039640618. ✘ Dispersion hardening

88039640619. ✔ Grain refinement

88039640620. ✘ Work hardening

**Question Number : 76 Question Id : 88039610156 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

During secondary creep, the creep rate

**Options :**

88039640621. ✘ Increases with time

88039640622. ✘ Decreases with time

88039640623. ✘ May increase or decrease with time depending on the type of material

88039640624. ✔ Doesn't change with time

**Question Number : 77 Question Id : 88039610157 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ is very sensitive to the surface roughness of test specimens.

**Options :**

88039640625. ✘ Tensile strength

88039640626. ✘ Impact strength

88039640627. ✘ Creep strength

88039640628. ✔ Fatigue strength

**Question Number : 78 Question Id : 88039610158 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is**

**Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Fractographic examination of a brittle fractured metallic material is expected to show

**Options :**

- 88039640629. ✘ Dimpled rupture features
- 88039640630. ✘ Grain facets and intergranular fracture features
- 88039640631. ✔ River patterns and chevron marks
- 88039640632. ✘ Beach marks and striations

**Question Number : 79 Question Id : 88039610159 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is**

**Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Why glass fibers exhibit increasing strength with decreasing diameter?

**Options :**

- 88039640633. ✔ Defects and imperfections in glass fibers get smaller and fewer as the fiber diameter is reduced
- 88039640634. ✘ Glass fibers work harden as the fiber diameter is reduced
- 88039640635. ✘ Glass fibers develop a fine grain size as the fiber diameter is reduced
- 88039640636. ✘ Glass fibers develop a more homogeneous composition as the fiber diameter is reduced

**Question Number : 80 Question Id : 88039610160 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

According to Griffith's theory of brittle fracture, the fracture strength of a material is

**Options :**

- 88039640637. ✘ Inversely proportional to the bond energy
- 88039640638. ✘ Inversely proportional to the grain size
- 88039640639. ✘ Inversely proportional to the crack length
- 88039640640. ✔ Inversely proportional to the square root of the crack length

**Question Number : 81 Question Id : 88039610161 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

According to Hall-Petch equation, the yield strength of a material is

**Options :**

- 88039640641. ✘ Directly proportional to the grain size
- 88039640642. ✘ Directly proportional to the square root of the grain size
- 88039640643. ✘ Inversely proportional to the grain size
- 88039640644. ✔ Inversely proportional to the square root of the grain size

**Question Number : 82 Question Id : 88039610162 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Young's modulus of aluminum is

**Options :**

88039640645. ✘ 69 Pa

88039640646. ✘ 69 MPa

88039640647. ✔ 69 GPa

88039640648. ✘ 69 MPa√m

**Question Number : 83 Question Id : 88039610163 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Fracture toughness is a measure of

**Options :**

88039640649. ✘ Resistance to plastic deformation

88039640650. ✘ Resistance to strain hardening

88039640651. ✘ Resistance to crack initiation

88039640652. ✔ Resistance to crack propagation

**Question Number : 84 Question Id : 88039610164 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is**

**Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Cross slip can occur more easily in materials with

**Options :**

88039640653. ✓ High stacking fault energy

88039640654. ✗ Low stacking fault energy

88039640655. ✗ High grain boundary energy

88039640656. ✗ Low grain boundary energy

**Question Number : 85 Question Id : 88039610165 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is**

**Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Nabarro-Herring creep dominates at

**Options :**

88039640657. ✗ Low temperatures and low stresses

88039640658. ✗ High temperatures and high stresses

88039640659. ✗ Low temperatures and high stresses

88039640660. ✓ High temperatures and low stresses

**Question Number : 86 Question Id : 88039610166 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is**

**Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**



**Correct Marks : 1 Wrong Marks : 0**

As per ASTM E8/E8M standard, the gauge length of a tensile specimen should be \_\_\_\_\_ times the gauge diameter.

**Options :**

88039640661. ✘ Two

88039640662. ✔ Four

88039640663. ✘ Six

88039640664. ✘ Eight

**Question Number : 87 Question Id : 88039610167 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

For materials which do not exhibit a fatigue limit, the fatigue strength is defined at \_\_\_\_\_ stress cycles.

**Options :**

88039640665. ✘  $10^2$

88039640666. ✘  $10^4$

88039640667. ✔  $10^6$

88039640668. ✘  $10^8$

**Question Number : 88 Question Id : 88039610168 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Which of the following is most detrimental for fatigue life?

Options :

- 88039640669. ✓ High mean stress and high stress range
- 88039640670. ✗ High mean stress and low stress range
- 88039640671. ✗ Low mean stress and low stress range
- 88039640672. ✗ Low mean stress and high stress range

**Question Number : 89 Question Id : 88039610169 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Which of the following hardness testing methods uses a ball indenter?

Options :

- 88039640673. ✗ Brinell and Vickers
- 88039640674. ✗ Vickers and Rockwell B
- 88039640675. ✗ Vickers and Knoop
- 88039640676. ✓ Brinell and Rockwell B

**Question Number : 90 Question Id : 88039610170 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**



**Correct Marks : 1 Wrong Marks : 0**

Lamellar tearing in steel welds is caused by

**Options :**

- 88039640677. ✓ Excessive sulfide and silicate inclusions in the steel base plates
- 88039640678. ✗ Excessive oxide and alumina inclusions in the steel base plates
- 88039640679. ✗ Very coarse grains in the steel base plates
- 88039640680. ✗ Very fine grains in the steel base plates

**Question Number : 91 Question Id : 88039610171 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is not true?

**Options :**

- 88039640681. ✓ Submerged arc welding can be carried out in all positions.
- 88039640682. ✗ Submerged arc welding is well-suited for welding of thick steel plates
- 88039640683. ✗ Submerged arc welding can achieve very high weld metal deposition rates
- 88039640684. ✗ Submerged arc welding can't be carried out in manual mode

**Question Number : 92 Question Id : 88039610172 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Alternating current is commonly used for gas-tungsten arc welding of

**Options :**

88039640685. ✘ Steels

88039640686. ✘ Stainless steels

88039640687. ✔ Aluminum alloys

88039640688. ✘ Titanium alloys

**Question Number : 93 Question Id : 88039610173 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Bimetal engine valves are commonly produced using

**Options :**

88039640689. ✔ Rotary friction welding

88039640690. ✘ Friction stir welding

88039640691. ✘ Explosive welding

88039640692. ✘ Ultrasonic welding

**Question Number : 94 Question Id : 88039610174 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Resistance spot welding electrodes are made of

Options :

88039640693. ✘ Tungsten

88039640694. ✘ Steel

88039640695. ✔ Copper

88039640696. ✘ Aluminum

Question Number : 95 Question Id : 88039610175 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ is recommended for enhancing the weld metal deposition rate in shield metal arc welding.

Options :

88039640697. ✔ Direct current electrode positive (DCEP) polarity

88039640698. ✘ Direct current electrode negative (DCEN) polarity

88039640699. ✘ Alternating current

88039640700. ✘ Pulsed current

Question Number : 96 Question Id : 88039610176 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In sheet metal forming, the problem of springback increases with

Options :

- 88039640701. ✘ Increase in tensile ductility of the sheet material
- 88039640702. ✔ Increase in yield strength of the sheet material
- 88039640703. ✘ Increase in elastic modulus of the sheet material
- 88039640704. ✘ Increase in thickness of the sheet material

Question Number : 97 Question Id : 88039610177 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ is a tensile forming process.

Options :

- 88039640705. ✘ Rolling
- 88039640706. ✘ Forging
- 88039640707. ✘ Extrusion
- 88039640708. ✔ Stretching

Question Number : 98 Question Id : 88039610178 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is not a severe plastic deformation process?

**Options :**

- 88039640709. ✘ Friction stir process
- 88039640710. ✘ Equi-channel angular extrusion
- 88039640711. ✘ Accumulated roll bonding
- 88039640712. ✔ Pilgering

**Question Number : 99 Question Id : 88039610179 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Materials with \_\_\_\_\_ tend to exhibit superplasticity.

**Options :**

- 88039640713. ✘ Fine grain size and low strain-rate sensitivity
- 88039640714. ✔ Fine grain size and high strain-rate sensitivity
- 88039640715. ✘ Coarse grain size and high strain-rate sensitivity
- 88039640716. ✘ Coarse grain size and low strain-rate sensitivity

**Question Number : 100 Question Id : 88039610180 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Friction between the container and the billet is the highest in

**Options :**

88039640717. ✓ Direct extrusion

88039640718. ✗ Indirect extrusion

88039640719. ✗ Hydrostatic extrusion

88039640720. ✗ Impact extrusion

**Question Number : 101 Question Id : 88039610181 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Stainless steel tumblers for household use are produced by

**Options :**

88039640721. ✗ Warm forging

88039640722. ✓ Deep drawing

88039640723. ✗ Stamping

88039640724. ✗ Extrusion

**Question Number : 102 Question Id : 88039610182 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

If a piece of metal is removed from a larger piece of sheet metal and the removed piece of metal is your product, then the process is termed

**Options :**



88039640725. ✓ Blanking

88039640726. ✗ Punching

88039640727. ✗ Piercing

88039640728. ✗ Drilling

**Question Number : 103 Question Id : 88039610183 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

What is the driving force for sintering of metal powders?

Options :

88039640729. ✓ Decrease in surface energy

88039640730. ✗ Increase in surface energy

88039640731. ✗ Increase in free energy

88039640732. ✗ Decrease in entropy

**Question Number : 104 Question Id : 88039610184 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Cermets are produced by

Options :

88039640733. ✘ Rapid solidification process

88039640734. ✔ Powder metallurgical process

88039640735. ✘ Thermo-mechanical process

88039640736. ✘ Friction stir process

**Question Number : 105 Question Id : 88039610185 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Which of the following metals is best suited for die casting?

Options :

88039640737. ✘ Cobalt

88039640738. ✘ Nickel

88039640739. ✘ Titanium

88039640740. ✔ Aluminum

**Question Number : 106 Question Id : 88039610186 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Automotive cylinder liners are commonly produced using

Options :



88039640741. ✘ Sand casting

88039640742. ✘ Investment casting

88039640743. ✔ Centrifugal casting

88039640744. ✘ Die casting

**Question Number : 107 Question Id : 88039610187 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Aeroengine turbine blades are produced by

**Options :**

88039640745. ✔ Vacuum investment casting

88039640746. ✘ High pressure die casting

88039640747. ✘ Low pressure die casting

88039640748. ✘ Semi-solid casting

**Question Number : 108 Question Id : 88039610188 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The principle that impure elements are more soluble in liquid metal than in solid metal is used in

**Options :**

88039640749. ✓ Zone refining

88039640750. ✘ Vacuum refining

88039640751. ✘ Vapour phase refining

88039640752. ✘ Electrolytic refining

**Question Number : 109 Question Id : 88039610189 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Cork is a good insulator because it has

**Options :**

88039640753. ✘ Free electrons

88039640754. ✘ Atoms colliding frequency

88039640755. ✘ Low density

88039640756. ✓ Porous body

**Question Number : 110 Question Id : 88039610190 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Which of the following nondestructive testing method is not suitable for examining titanium alloys?

**Options :**

88039640757. ✘ Liquid penetrant testing

88039640758. ✔ Magnetic particle inspection

88039640759. ✘ Ultrasonic testing

88039640760. ✘ Radiographic testing

**Question Number : 111 Question Id : 88039610191 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ can only be used for inspecting electrically conductive materials.

**Options :**

88039640761. ✘ Liquid penetrant testing

88039640762. ✔ Eddy current testing

88039640763. ✘ Ultrasonic testing

88039640764. ✘ Radiographic testing

**Question Number : 112 Question Id : 88039610192 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Magnetic particle inspection can reveal

**Options :**

88039640765. ✘ Only surface defects

88039640766. ✔ Both surface and near-surface defects

88039640767. ✘ Surface as well as internal defects

88039640768. ✘ Only internal defects

**Question Number : 113 Question Id : 88039610193 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Coarse grain size can affect the sensitivity of

**Options :**

88039640769. ✘ Liquid penetrant testing

88039640770. ✘ Magnetic particle inspection

88039640771. ✔ Ultrasonic testing

88039640772. ✘ Radiographic testing

**Question Number : 114 Question Id : 88039610194 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Domestic cooking vessels are commonly made of

**Options :**

88039640773. ✓ Austenitic stainless steels

88039640774. ✗ Ferritic stainless steels

88039640775. ✗ Duplex stainless steels

88039640776. ✗ Martensitic stainless steels

**Question Number : 115 Question Id : 88039610195 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Industrial knives are commonly produced using

**Options :**

88039640777. ✗ Austenitic stainless steels

88039640778. ✗ Duplex stainless steels

88039640779. ✓ Martensitic stainless steels

88039640780. ✗ Ferritic stainless steels

**Question Number : 116 Question Id : 88039610196 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ are commonly used in automotive exhaust systems.

**Options :**

88039640781. ✓ Ferritic stainless steels

88039640782. ✗ Austenitic stainless steels

88039640783. ✗ Martensitic stainless steels

88039640784. ✗ Duplex stainless steels

**Question Number : 117 Question Id : 88039610197 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ stainless steels are suitable for use at sub-zero temperatures.

**Options :**

88039640785. ✗ Martensitic stainless steels

88039640786. ✓ Austenitic stainless steels

88039640787. ✗ Ferritic stainless steels

88039640788. ✗ Duplex stainless steels

**Question Number : 118 Question Id : 88039610198 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Beverage cans are commonly made of

**Options :**

88039640789. ✘ Al-Si alloys

88039640790. ✔ Al-Mg alloys

88039640791. ✘ Al-Zn-Cu alloys

88039640792. ✘ Al-Cu alloys

**Question Number : 119 Question Id : 88039610199 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ are widely used in biomedical applications.

**Options :**

88039640793. ✘ Nickel alloys

88039640794. ✘ Copper alloys

88039640795. ✘ Aluminum alloys

88039640796. ✔ Titanium alloys

**Question Number : 120 Question Id : 88039610200 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Shape memory alloys exhibit

**Options :**

88039640797. ✓ Reversible martensitic transformation

88039640798. ✘ Reversible eutectoid transformation

88039640799. ✘ Reversible eutectic transformation

88039640800. ✘ Reversible peritectic transformation