Metallurgical Engineering_Set2

Topic:- Mathematics_Set2

If
$$A + B = \begin{bmatrix} 1 & -1 \\ 3 & 0 \end{bmatrix}$$
 and $A - B = \begin{bmatrix} 3 & 1 \\ 1 & 4 \end{bmatrix}$, then $AB = \begin{bmatrix} 1 & 1 \\ 1 & 4 \end{bmatrix}$

[Question ID = 13593]

$$\begin{bmatrix} -2 & 2 \\ 0 & -6 \end{bmatrix}$$

$$\begin{bmatrix} -2 & -2 \\ 2 & -4 \end{bmatrix}$$

$$\begin{bmatrix} -2 & -2 \\ 0 & -6 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

Correct Answer :-

$$\begin{bmatrix} -2 & -2 \\ 0 & -6 \end{bmatrix}$$

2) If
$$A = \begin{bmatrix} 1 \\ 0 \\ 2 \end{bmatrix}$$
; $B = \begin{bmatrix} 1 & -1 & 0 \\ 0 & 2 & 3 \\ 4 & 0 & -1 \end{bmatrix}$, then $A^T B A = \begin{bmatrix} 1 & -1 & 0 \\ 0 & 2 & 3 \\ 4 & 0 & -1 \end{bmatrix}$

[Question ID = 13594]



2. [0]

$$\begin{bmatrix} 1 & -1 & 0 \\ 0 & 1 & 0 \\ 0 & 6 & -2 \end{bmatrix}$$

$$\begin{bmatrix} 1 & -1 & 0 \\ 0 & 2 & 3 \\ 4 & 0 & -1 \end{bmatrix}$$

Correct Answer :-

[5]

3) $\begin{vmatrix} x-y & p-q & a-b \\ y-z & q-r & b-c \\ z-x & r-p & c-a \end{vmatrix} =$

[Question ID = 13595]

1. 1

2. 2

3. xyz- pqr+ abc

4.0

Correct Answer :-

• (

The solution of the equation $\begin{vmatrix} 5-x & 4 & 3 \\ 1-3x & 7 & 6 \\ 1-x & 6 & 5 \end{vmatrix} = 0 \text{ is}$

[Question ID = 13596]

 $_{1.}$ x = 1

 $_{2}$. x = 2

3. x = 0



$$x = 5$$

$$x=1$$

The inverse of the matrix $A = \begin{bmatrix} a+ib & c+id \\ -c-id & a-ib \end{bmatrix}$.

if
$$a^2 + b^2 + c^2 + d^2 = 1$$
 is

[Question ID = 13597]

$$\begin{bmatrix} a-ib & c-id \\ c+id & a-ib \end{bmatrix}$$

$$\begin{bmatrix} a-ib & -c-id \\ c-id & a+ib \end{bmatrix}$$

$$\begin{bmatrix} c - id & a - ib \\ a + ib & c + id \end{bmatrix}$$

$$\begin{bmatrix} a-ib & c-id \\ -c-id & a+ib \end{bmatrix}$$

Correct Answer :-

$$\begin{bmatrix} a-ib & -c-id \\ c-id & a+ib \end{bmatrix}$$

$$\frac{x^2}{x^2 - 3x + 2} =$$

[Question ID = 13598]

$$\frac{1}{x-1} + \frac{2}{x-2}$$



$$1 - \frac{1}{1 - x} + \frac{3}{x - 2}$$

$$1 + \frac{1}{1 - x} + \frac{4}{x - 2}$$

$$1 - \frac{1}{x - 1} + \frac{2}{x - 2}$$

$$1 + \frac{1}{1-x} + \frac{4}{x-2}$$

If
$$Sin\theta + Co\sec\theta = 2$$
, then the value of $Sin^3\theta + Co\sec^3\theta =$

[Question ID = 13599]

- 1. 0
- 2. 1
- 3. 2
- 4.8

Correct Answer :-

• 2

The value of
$$Sin^2 \left(\frac{\pi}{8} + \frac{\theta}{2} \right) - Sin^2 \left(\frac{\pi}{8} - \frac{\theta}{2} \right) =$$

[Question ID = 13600]

$$\frac{1}{\sqrt{2}}$$

$$\frac{1}{2}\sin\theta$$

$$\frac{1}{\sqrt{2}}\sin\theta$$



$$\sin(\frac{\theta}{2})$$

$$\frac{1}{\sqrt{2}}\sin\theta$$

9) 7 4

If x, y are in first quadrant, $tan(x - y) = \frac{7}{24}$ and $tan(x) = \frac{4}{3}$, then $x + y = \frac{1}{3}$

[Question ID = 13601]

$$\frac{3}{4}$$

$$\frac{\pi}{2}$$

$$\frac{\pi}{4}$$

Correct Answer :-

$$\frac{\pi}{2}$$

If $A - B = \frac{3\pi}{4}$, then $(1 - \tan A)(1 + \tan B) =$

[Question ID = 13602]

Correct Answer :-

. 2



11)
$$\sec^2(\tan^{-1} 3) + \cos ec^2(\cot^{-1} 3) =$$

[Question ID = 13603]

- 1. 1
- 2. 10
- 3. 20
- 4.30

Correct Answer :-

• 20

12)
$$3Co\sec x = 4Sinx \Rightarrow x =$$

[Question ID = 13604]

$$n\pi \pm \frac{\pi}{2}; n \in z$$

$$n\pi \pm \frac{\pi}{3}; n \in z$$

$$2n\pi \pm \frac{\pi}{2}; n \in z$$

$$n\pi \mp \frac{\pi}{4}$$
; $n \in z$

Correct Answer :-

$$n\pi \pm \frac{\pi}{3}; n \in z$$

13) If $x = \log_{\epsilon} \left(5 + \sqrt{26}\right)$, then Sinhx =

[Question ID = 13605]

- 1. 5
- , 1
- 3



4. log_e 5

Correct Answer :-

_ 5

14)

If a, b and c are the lengths of the sides opposite to the angles A,B and C of a triangle ABC, then

$$(b-c)^{2} Cos^{2} \frac{A}{2} + (b+c)^{2} Sin^{2} \frac{A}{2} =$$

[Question ID = 13606]

- 1. a
- 2. b
- 3. b^2
- 4. *a*²

Correct Answer :-

 a^2

15) If $z = 2 - i\sqrt{7}$, then $2z^2 - 8z + 22 =$

[Question ID = 13607]

- 1. 0
- 2.1
- 3. 2
- 4.4

Correct Answer :-

• (

The least positive integer n, satisfying $\left(\frac{1+i}{1-i}\right)^n = 1$ is

[Question ID = 13608]

1. 2



- 2. 1
- 3. 4
- 4.8

- 4
- The distance between the parallel straight lines 3x-4y-3=0 and 6x+8y-1=0 is

[Question ID = 13609]

- $\frac{1}{2}$
- $\frac{1}{4}$
- 3. l
- $\sqrt{2}$

Correct Answer :-

- $\frac{1}{2}$
- Angle between the lines 3x-5y-9=0; 4x-y+7=0 is

[Question ID = 13610]

- $\theta = 30^{\circ}$
 - $\theta = 45^{\circ}$
- 3. $\theta = 60^{\circ}$
- 4. $\theta = 15^{\circ}$



$$\theta = 45^{\circ}$$

19)

Equation of the circle passing through (3,-4) and concentric with $x^2 + y^2 + 4x - 2y + 1 = 0$ is

[Question ID = 13611]

$$x^2 + y^2 + 4x - 2y - 15 = 0$$

$$x^2 + y^2 + 4x - 2y - 30 = 0$$

$$x^2 + y^2 + x - 2y - 45 = 0$$

$$x^2 + y^2 + 4x - 2y - 45 = 0$$

Correct Answer :-

$$x^2 + y^2 + 4x - 2y - 45 = 0$$

The eccentricity of Ellipse $9x^2 + 16y^2 = 144$ is

[Question ID = 13612]

$$\frac{7}{4}$$

$$\frac{\sqrt{7}}{4}$$

$$\frac{5}{4}$$

$$\frac{3}{3}$$

4

$$\frac{\sqrt{7}}{4}$$

$$\lim_{x \to 0} \frac{8^x - 2^x}{x} =$$

[Question ID = 13613]

- 1. log 2
- 2.0
- 3. log 4
- 4. 1

Correct Answer :-

log 4

22) If
$$y = \cos^{-1}(4x^3 - 3x)$$
, then $\frac{dy}{dx} =$

[Question ID = 13614]

$$\frac{-3}{\sqrt{1-x^2}}$$

2.
$$\frac{4}{\sqrt{1-x^2}}$$
3.
$$\frac{1}{\sqrt{1+x^2}}$$
4.
$$\frac{-4}{3\sqrt{1-x^2}}$$

3.
$$\frac{1}{\sqrt{1+x^2}}$$

$$\frac{-4}{3\sqrt{1-x^2}}$$

$$\frac{-3}{\sqrt{1-x^2}}$$

If
$$y = (\sin x)^{\log x}$$
, then $\frac{dy}{dx} =$

[Question ID = 13615]

 $(\sin x)^{\log x} \left\{ \tan x \cdot \log x + \log(\sin x) \right\}$

$$\log x \left\{ \cot x \cdot \sin x + \frac{1}{x} \log(\sin x) \right\}$$
2.

$$(\sin x)^{\log x} \left\{ \cot x . \log x + \frac{1}{x} \log(\sin x) \right\}$$
3.

$$\left(\cos x\right)^{\log x} \left\{ \tan x \cdot \log x + \frac{1}{x} \log(\cos x) \right\}$$

Correct Answer :-

$$(\sin x)^{\log x} \left\{ \cot x \cdot \log x + \frac{1}{x} \log(\sin x) \right\}$$

If
$$y = \log(x + \sqrt{1 + x^2})$$
, then $(1 + x^2)\frac{d^2y}{dx^2} + x\frac{dy}{dx} =$

[Question ID = 13616]

- 1.
- 2. ⁽⁾
- 3. X

$$\frac{1}{\sqrt{1+x^2}}$$

Correct Answer :-

. 0



At $\theta = \frac{\pi}{4}$, the slope of the normal to the curve $x = a \cos^3 \theta$; $y = a \sin^3 \theta$ is

[Question ID = 13617]

- 1. -1
- 2. -2
- 3. 2
- 4.1

Correct Answer :-

0

· .

If
$$x^y = e^{x-y}$$
, then $\frac{dy}{dx} =$

[Question ID = 13618]

$$\frac{\log x}{(1+\log x)^2}$$

$$\frac{1}{(1+\log x)^2}$$

$$\frac{\log x}{1 + \log x}$$

$$4. \frac{\left(\log x\right)^2}{\left(1 + \log x\right)^2}$$

Correct Answer :-

$$\frac{\log x}{(1+\log x)^2}$$

Equation of the tangent to the curve $y = 5x^4$ at the point (1.5) is

[Question ID = 13619]

$$y = 15(x-1)$$



$$y = 20x - 15$$

$$x = 15y - 20$$

$$y = 20(x-1)$$

$$y = 20x - 15$$

If
$$u = \sin^{-1} \left(\frac{x^2 + y^2}{x + y} \right)$$
, then $x \frac{\partial u}{\partial y} + y \frac{\partial u}{\partial y} =$

[Question ID = 13620]

- 1. cot u
- 2. tan u
- 3. 1
- 4. sin u

Correct Answer :-

• tan u

$$\int \frac{a}{b + ce^x} dx =$$

[Question ID = 13621]

$$\frac{a}{b} \log \left(\frac{e^x}{b + ce^x} \right) + C$$

$$\frac{b}{a} \log \left(\frac{e^{-x}}{b + e^{-x}} \right) + C$$

$$\frac{a}{b}\log\left(\frac{1}{be^x + ce^{-x}}\right) + C$$

$$\frac{b}{a}e^{(b+ce^{\epsilon})} + C$$



$$\frac{a}{b} \log \left(\frac{e^x}{b + ce^x} \right) + C$$

$$\int \frac{1}{(1+x^2)\tan^{-1}x} dx =$$

[Question ID = 13622]

1.
$$tan^{-1}x + C$$

4.
$$\log (\tan^{-1} x) + C$$

Correct Answer :-

•
$$\log (\tan^{-1}x) + C$$

$$\int \frac{\cos(\log x^2)}{x^4} dx =$$

[Question ID = 13623]

$$\frac{1}{x^3} \cos \left[\log x^2 + \tan^{-1} (\frac{3}{2}) \right] + C$$

$$\int_{2}^{\frac{x^3}{\sqrt{13}}} Cos \left[\log x^2 + \cot^{-1}(\frac{2}{3}) \right] + C$$

$$\int_{3}^{1} \frac{-1}{2 x^3} \cos \left[\log x^2 + \tan^{-1} \left(\frac{2}{3} \right) \right] + C$$

$$\frac{1}{x^3 \sqrt{13}} Cos \left[log x^2 + cot^{-1} (\frac{3}{2}) \right] + C$$



$$\frac{1}{x^3} \cos \left[\log x^2 + \tan^{-1}\left(\frac{3}{2}\right)\right] + C$$

$$\int \frac{dx}{e^x - 1} =$$

[Question ID = 13624]

$$\log\left(\frac{1-e^x}{e^x}\right) + C$$

 $\log(e^x - 1) + C$

$$\log\left(\frac{e^x-1}{e^x}\right) + C$$

$$\log \left(\frac{e^{-x} - 1}{e^{-x}} \right) + C$$

Correct Answer :-

$$\log\left(\frac{e^x-1}{e^x}\right) + C$$

$$\int \frac{\sin^3 x + \cos^3 x}{\sin^2 x \cos^2 x} dx =$$

[Question ID = 13625]

1.
$$\sec x + \cot x$$

$$\cos ecx - \cot x$$

$$\cos ecx + \tan x$$

$$\sec x - \cos ecx$$



 $\sec x - \cos ecx$

$$\int_{0}^{\pi/4} \frac{e^{\tan x}}{\cos^2 x} dx$$

[Question ID = 13626]

- e-1
- $e^{-1} 1$
- $e^{-1} +$
- $e^{-2} \frac{1}{2}$

Correct Answer :-

e-1

,........

35)
$$\int_{0}^{\pi} \sin^{3} x (1 - \cos x)^{2} dx =$$

[Question ID = 13627]

- 1.5/3
- 2.8/5
- 3. 1
- 4.0

Correct Answer :-

8/5

36)

The volume generated by the revolution of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ about its major axis is

[Question ID = 13628]



$$\frac{4}{3}\pi ab^2$$

$$\frac{4}{3}\pi a^2 b$$

$$\frac{8}{3}\pi a^2b^2$$

$$\frac{4}{3}\pi ab^2$$

The general solution of
$$x \frac{dy}{dx} = y[\log y - \log x + 1]$$
 is

[Question ID = 13629]

$$y = Ce^x$$

$$y = Ce^{y}$$

$$y = xe^{cx}$$

$$x = Ce^{y/x}$$

Correct Answer :-

$$y = xe^{cx}$$

A and B are arbitrary constants, the differential equation having $xy = Ae^x + Be^{-x} + x^2$ as its general solution is

[Question ID = 13630]



$$y'' + 2xy' - xy + x^2 = 0$$

$$xy'' + y' - xy - 2 = 0$$

$$xy'' + 2y' - 2xy + 3x^2 - 2 = 0$$

$$xy'' + 2y' - xy + x^2 - 2 = 0$$

$$xy'' + 2y' - xy + x^2 - 2 = 0$$

The solution of
$$(e^{-2\sqrt{x}} - y)\frac{dx}{dy} = \sqrt{x}$$

[Question ID = 13631]

$$y = e^{-2\sqrt{x}} \left(2\sqrt{x} + C \right)$$

$$y = e^{-2\sqrt{x}} + \sqrt{x} + C$$

$$y = e^{-2\sqrt{x}} + e^{\sqrt{x}} \sqrt{x} + C$$

$$y = e^{2\sqrt{x}} + \log x + C$$

Correct Answer :-

$$y = e^{-2\sqrt{x}} \left(2\sqrt{x} + C \right)$$

The solution of Cosx dy = (Sinx - y)ydx

[Question ID = 13632]

$$y = \sec x \tan x + C$$

$$y^{-1}Co\sec x = \cot x + C$$



$$y^{-1} \sec x = \tan x + C$$

$$y = \log \sin x + C$$

$$y^{-1}\sec x = \tan x + C$$

The solution of $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 5y = 0$ satisfying y(0) = 1 and y'(0) = 0 is

[Question ID = 13634]

$$y = e^{-2x} [\cos x + 2\sin x]$$

$$y = e^{-x} \left[2\cos x + \sin x \right]$$

$$y = e^{2x} [2\cos x + 3\sin x]$$

$$y = e^x [\cos x + 2\sin x]$$

Correct Answer :-

$$y = e^{-2x} [\cos x + 2\sin x]$$

42)
$$\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = 2e^x$$
; with $y(0) = 1$; $y'(0) = 1$ satisfies

[Question ID = 13635]

$$y = c_1 e^{2x} + c_2 e^{3x} + e^x$$

$$y = 2e^{2x} + 3e^{3x} + e^{x}$$

$$y = e^{2x} + 2e^{3x} + e^{-x}$$



4.
$$y = e^{x}$$

$$y = e^x$$

The solution of $(y \log x - 2) y dx = x dy$

[Question ID = 13636]

$$y = x(\log x + C)$$

$$y = \frac{1}{x} \log x + x - C$$

$$\frac{1}{y} = x \log x + x + Cx$$

$$\frac{1}{y} = x^2 \log x + x + C$$

Correct Answer :-

$$\frac{1}{y} = x^2 \log x + x + C$$

44) Mean deviation about the median for the data 4,6,9,3,10,13,2 is [Question ID = 13641]

- 1.4.31
- 2. 5.253
- 3.3.285
- 4. 3.785

Correct Answer :-

- 3.285
- **45)** If E_1 , E_2 are any two events of a random experiment and P is a probability function then

[Question ID = 13642]



$$P(E_1 \cap E_2) = P(E_1) + P(E_2) - P(E_1 \cap E_2)$$

$$P(E_1 \cup E_2) = P(E_1) + P(E_2) - P(E_1 \cap E_2)$$

$$P(E_1 \cap E_2) = P(E_1) + P(E_2) + P(E_1 \cup E_2)$$

$$_{\mathbf{4}} P(E_1 \cup E_2) = P(E_1) + P(E_2) - P(E_1 \cup E_2)$$

$$P(E_1 \cup E_2) = P(E_1) + P(E_2) - P(E_1 \cap E_2)$$

The solution of the initial value problem
$$\frac{d^2x}{dt^2} - 3\frac{dx}{dt} - 2x = 0;$$

with $x(0) = 2$; $x'(0) = 0$ is

[Question ID = 23975]

$$x(t) = Ae^t + Be^{2t}$$

$$x(t) = 2e^t - 4e^{2t}$$

$$x(t) = 4e^t - 2e^{2t}$$
3.

$$x(t) = e^{t} - 2e^{2t}$$

Correct Answer :-

$$x(t) = 4e^t - 2e^{2t}$$

The Laplace transform of
$$\left\{\frac{e^{-at}t^{n-1}}{(n-1)!}\right\} =$$

[Question ID = 23976]



$$\frac{e^{-at}}{(s-a)^n}$$

$$\frac{1}{(s+a)^n}$$

$$\frac{1}{\left(s-a\right)^{n}}$$
3.

$$\frac{e^{at}}{(s-a)^n}$$

$$\frac{1}{(s+a)^n}$$

The inverse Laplace transform of
$$\left\{\frac{1}{(8s-27)^{1/3}}\right\} =$$

[Question ID = 23977]

$$\frac{e^{(3/2)t}t^{-2/3}}{\Gamma\left(\frac{1}{3}\right)}$$

$$\frac{e^{(8/27)t}t^{-3/2}}{2\Gamma\left(\frac{1}{3}\right)}$$

$$\frac{e^{(2/3)t} t^{-3/2}}{2\Gamma\left(\frac{1}{2}\right)}$$

$$\frac{e^{(27/8)r}t^{-2/3}}{2\Gamma\left(\frac{1}{3}\right)}$$



$$\frac{e^{(27/8)t}t^{-2/3}}{2\Gamma\left(\frac{1}{3}\right)}$$

49) If $f(x) = \begin{cases} 0 & ; -\pi \le x \le 0 \\ \sin x ; & 0 \le x \le \pi \end{cases}$, $f(x+2\pi) = f(x)$ and

 $f(x) = \frac{a_0}{2} + \sum_{n=1}^{\infty} (a_n \cos nx + b_n \sin nx), \text{ then } a_n =$

[Question ID = 23978]

 $\frac{1}{\pi}$

2.

3. 0

2

4. π

Correct Answer :-

 $\frac{2}{\pi}$

The inverse Laplace transform of $\left\{ \frac{s+3}{s^2+6s+25} \right\} =$

[Question ID = 23979]

 $e^{-3t}\cos 4t$

 $e^{3t}\sin 4t$



$$e^{3t}\cos 4t$$

$$e^{-3t}\cos 3t$$

$$e^{-3t}\cos 4t$$

Topic:- Physics_set2

The physical quantity having the dimension [ML²T⁻³] is

[Question ID = 34198]

- 1. work
- 2. power
- 3. pressure
- 4. impulse

Correct Answer :-

- power
- Force F is given by $F=at+bt^2$ where t is time. The dimensions of a and b are

[Question ID = 34199]

[MLT
$$^{-1}$$
] and [MLT 0]

Correct Answer :-

[MLT⁻³] and [MLT⁻⁴]

The magnitudes of two vectors are 4 and 5 and their scalar product is 10. Then the angle between the two vectors is [Question ID = 34200]
1. 30°
2. ^{45°}
3. 60°
0° 4.
Correct Answer :-
60°
4) If $\bar{a} + \bar{b} = \bar{c}$ and $\bar{a}^2 + \bar{b}^2 = \bar{c}^2$, then the angle between the vectors \bar{a} and \bar{b} is
[Question ID = 34201]
1. 0°
2. 20°
3. 45°
90° 4.
Correct Answer :-
• 90°
5) \bar{a} and \bar{b} are two vectors and θ is the angle between them. If $ \bar{a} \times \bar{b} = \sqrt{3} (\bar{a} \cdot \bar{b})$, the value of θ is

[Question ID = 34202]

- 1. 30°
- 2. 45°



3. 60°

, 90°

Correct Answer :-

30°

6) A body under action of five forces can be in equilibrium [Question ID = 34203]

- 1. if all forces are equal
- 2. sum of resolved components along x-axis is zero
- 3. sum of resolved components along y-axis is zero
- 4. sum of resolved components along x-axis and y-axis, individually zero

Correct Answer :-

• sum of resolved components along x-axis and y-axis, individually zero

7) Two vibrating systems are said to be in resonance, if their [Question ID = 34204]

- 1. amplitudes are equal
- 2. temperatures are equal
- 3. frequencies are equal
- 4. phase values are equal

Correct Answer :-

frequencies are equal

8)

A balloon is ascending at the rate of 9.8 ms⁻¹ at a height of 39.2 m above the ground when a food packet is dropped from the balloon. The velocity with which the food packet reach the ground is

[Question ID = 34205]



- 29.4 ms⁻¹

9)	The	walls	of hal	l built for	music	concerts	should	[Question	ID =	34206]	
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- 1. amplify sound
- 2. reflect sound
- 3. transmit sound
- 4. absorb sound

Correct Answer :-

· absorb sound

10) When a star approaches the earth , the waves are shifted towards [Question ID = 34207]

- 1. green colour
- 2. yellow colour
- 3. blue end
- 4. red end

Correct Answer :-

blue end

11)

A body of mass m is placed on a rough surface with coefficient of friction μ inclined at θ . If the mass is in equilibrium, then the value of θ is

[Question ID = 34208]

3.

4.

Correct Answer :-

Tan ⁻¹μ

collegedunia

If water falls from a dam into a turbine wheel	19.6 m below, then the velocity of water at the
turbine is (given g=9.8 ms ⁻²)	

[Question	ID	=	342097
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220
ns

19.6 ms⁻¹

13) Two springs of spring constants 1000 N/m and 1500 N/m respectively are stretched with a same force. Their potential energies will be in the ratio of

[Question ID = 34210]

- 1. 2:3
- 2.1:3
- 3.3:2
- 4. 2:1

Correct Answer :-

• 3:2

14) The mass of a body at the centre of earth is

[Question ID = 34211]

- 1. less than that at the surface
- 2. remain constant
- 3. more than that at the surface
- 4. zero



· remain constant

15)

The maximum velocity of a particle executing simple harmonic motion with an amplitude 7 mm is 4.4 ms⁻¹. The period of oscillation is

[Question ID = 34212]

- 1. 0.01 s
- 2. 0.1 s
- 3. 10 s
- 4. 100 s

Correct Answer :-

• 0.01 s

16) In a simple harmonic oscillator, at the mean position [Question ID = 34213]

- 1. both kinetic energy and potential energies are minimum
- 2. kinetic energy is maximum, potential energy is minimum
- 3. kinetic energy is minimum, potential energy is maximum
- 4. both kinetic energy and potential energies are maximum

Correct Answer :-

- kinetic energy is maximum, potential energy is minimum
- 17) The intensity of sound produced by thunder is 0.1Wm⁻². The intensity level in decibels is

[Question ID = 34214]

- 1. 110 dB
- 2. 100 dB
- 3. 90 dB
- 4. 140 dB

Correct Answer :-

- 110 dB
- 18) A classroom has dimensions 20 x 15 x 5 m³. The reverberation time is 3.5 s. The average absorption coefficient is

[Question ID = 34215]

- 1.0.05
- 2.0.09
- 3. 0.03
- 4. 0.07



C		A			20
COIT!	rect	AI	15 W	wer.	-

0.07

19) Which of the following is not a characteristic of musical sound? [Question ID = 34216]

- 1. pitch
- 2. loudness
- 3. frequency
- 4. quality

Correct Answer :-

frequency

20) In a simple harmonic motion, the particle is [Question ID = 34217]

- 1. always accelerated
- 2. alternately accelerated and retarded
- 3. always retarded
- 4. neither accelerated nor retarded

Correct Answer :-

· alternately accelerated and retarded

21)

100 g of water is heated from 30°C to 50°C. Ignoring the slight expansion of water, the change in its internal energy is (specific heat of water is 4200 J kg⁻¹K⁻¹)

[Question ID = 34218]

- 1. 4.2 kJ
- 2.84 kJ
- 3. 2.1 kJ
- 4. 8.4 kJ

Correct Answer :-

• 8.4 kJ

22) Which of the following is correct [Question ID = 34219]

1.
$$(T_1/H_2) + (T_2/H_1) = 0$$

2.
$$(H_1/T_1) = (H_2/T_2)$$

3.
$$H_1 T_1 = H_2 T_2$$

4.
$$H_1 T_1 + H_2 T_2 = 0$$



23) An ideal gas in a cylinder is compressed adiabatically to one-third its original volume. During the process 50J of work is done on the gas by the compressing agent. The change in the internal energy of the gas in the process is [Question ID = 34220] 1. 50 J
2. 50/3 J 3. 150 J 4. 45 J
Correct Answer :- • 50 J
24) The maximum kinetic energy of photoelectrons ejected from a potassium surface by ultraviolet light of wavelength 200 nm is (photoelectric threshold wavelength for potassium is 440 nm) [Question ID = 34221]
1. 2.82 eV 2. 4.40 eV 3. 6.20 eV 4. 3.38 eV
Correct Answer :- • 3.38 eV
25) For a light wave to undergo total internal reflection ('i _e ' is critical angle, 'i' is incident angle)
[Question ID = 34222]
light moves from rarer to denser medium and $i > i_c$ 1.
light moves from denser to rarer medium and $i > i_c$ 2.
light moves from rarer to denser medium and $i < i_c$
light moves from denser to rarer medium and $i < i_c$
Correct Answer :-
light moves from denser to rarer medium and i >i _c

Topic:- Chemistry_Set2

 $(H_1/T_1) = (H_2/T_2)$



1) For an f-orbital, the values of 'm' are [Question ID = 23999]

Correct Answer :-

2) Among LiCl, BeCl₂, BCl₃ and CCl₄, the covalent character follows the order:

[Question ID = 24000]

- 1. LiCl>BeCl₂>BCl₃>CCl₄
- 2. LiCl<BeCl2<BCl3<CCl4
- 3. LiCl>BeCl2<BCl3>CCl4
- 4. LiCl<BeCl2<BCl3>CCl4

Correct Answer :-

LiCl<BeCl2<BCl3<CCl4

3) Lowest oxidation state in its compound is exhibited by

[Question ID = 24001]

- 1. N
- 2.0
- 3. C
- 4. F

Correct Answer :-

• F

4) Which of the following contains ionic, covalent and coordinate covalent bonds

[Question ID = 24002]

- 1. NH₄Cl
- 2. $K_3[Fe(CN)_6]$
- 3. CuSO₄
- 4. NH4Cl, CuSO4 and K3[Fe(CN)6]



5) Mola	rity of 4% (W/V) solution of NaOH is [Question ID = 24003]
1. 0.1	
2. 0.5	
3. 0.001	
4. 1	
Correct	Answer :-
• 1	
6) The	weight of H ₂ C ₂ O ₄ . 2H ₂ O required to prepare 500mL of 0.2 N solution is
[Questi	on ID = 24004]
1. 1.26 g	
2. 6.3g	
3. 1.575	l.
4. 3.15g	
Correct	Answer :-
• 6.3g	
7) The	conjugate base of hydrogen molecule is [Question ID = 24005]
1. Electro	
Hydric	
3. Protor	
4. Hydro	
26	
Correct	Answer :-
 Hydric 	e ion
8) p ^H C	f a solution is 1. It is diluted by 1×10^{3} times. The p^{H} of the resulting solution will b
[Question	on ID = 24006]
1. 1	
2. 3	
3. 4 4. 5	



[Question ID = 24007]
$Na_{2}B_{4}O_{7}$ 1.
2. CaO
3. SiO ₂
4. P_2O_5
Correct Answer :-
- CaO
10) Roasting of a metal oxide is carried out in which of the following furnaces
[Question ID = 24008]
1. Blast furnace
2. Reverberatory furnace
3. Both reverbaratory furnace and blast furnace
4. Muffle furnace
Correct Answer :-
Reverberatory furnace
11) Three faradays of electricity was passed through an aqueous solution of Ferrous chloride. The weight of iron metal (at Wt = 56) deposited at the cathode in grams is [Question ID = 24009]
1. 56
2. 84 3. 112
4. 168
Correct Answer :-
■ 84
12) Which one of the following could not be liberated from a suitable electrolyte by the passage of 0.25 Faraday of electricity through the electrolyte [Question ID = 24010]
[Ancountry - 54010]

9) Which of the following is a basic flux

1. 0.25 mole of Ag

2. 16 gms of Cu



- 3. 2gms of O₂ (g)
- 4. 2.8 lit of H₂ at STP

• 16 gms of Cu

13) . Given standard electrode potentials

Fe³⁺ + 3e³ ----> Fe
$$E^0 = -0.036 \text{ V}$$

Fe²⁺ + 2e⁻ ----> Fe
$$E^0 = -0.440 \text{ V}$$

The standard electrode potential E^{+} for $Fe^{-3+} + e^{-} - ---> Fe^{2+}$ is

[Question ID = 24011]

- 1. 0.476 V
- 2. -0.404 V
- 3. 0.40 V
- 4. 0.772 V

Correct Answer :-

- 0.772 V
- 14) Water acts as an excellent solvent, due to which property among the following:

[Question ID = 24012]

- 1. High viscosity
- 2. High Entholpy of formation
- 3. High dielectric constant
- 4. High density

Correct Answer :-

• High dielectric constant

15) A sample of water has $Mg(HCO_3)_2 = 73 \text{ mg/L}$, $Ca(HCO_3)_2 = 162 \text{ mg/L}$, $MgCl_2 = 95 \text{ mg/L}$ and $CaSO_4 = 136 \text{ mg/L}$. Temporary hardness in ppm is

[Question ID = 24013]

1. 150



2. 350
3. 500
4. 200
Correct Answer :-
• 150
16) The process which removes all ionic, colloidal and high molecular weight organic matter in water is [Question ID = 24014]
1. Ion exchange process
2. zeolite process
3. Reverse osmosis
4. Lime soda process
Correct Answer :-
 Reverse osmosis
17) The monomer used in PVC preparation is [Question ID = 24015]
1. Ethene
2. Chloroethene
3. Dichloroethene
4. Tetrachloroethene
Correct Answer :-
• Chloroethene
18) The chemical used for accelerating Vulcanization is
[Question ID = 24016]
1. ZnO
2. SiO ₂
3. Sulphur
4. Zinc sterate
Correct Answer :-
• Sulphur

- 19) Which one of the following type of forces are present in Nylon-6,6 [Question ID = 24017]
- 1. Electrostatic forces of attraction
- 2. Hydrogen bonding
- 3. Three dimensional network of bonds
- 4. Metallic bonding



Correct Answer :-
 Hydrogen bonding
20) Which one of the following is a primary pollutant
[Question ID = 24018]
1. CO
2. PAN
3. Aldehyde
4. H ₂ SO ₄
Correct Answer :-
• co
21) Ozone layer of upper atmosphere is being destroyed by
[Question ID = 24019]
Photochemical oxidants like O_2 and CO_2 1.
2. Chloro fluorocarbon
3. Smog
SO ₂ 4.
Correct Answer :-
- Chloro fluorocarbon
22) Eutrophication causes reduction in [Question ID = 24020]
 Dissolved salts Dissolved hydrogen Dissolved oxygen Dissolved solids
Correct Answer :-



Dissolved oxygen



```
CH_4
1.
2. C<sub>2</sub>H<sub>6</sub>
 H_2
3.
   CO+CO_2
Correct Answer :-
   CH_4
24) Which one of the following metals could provide cathodic protection to iron [Question ID =
24022]
1. Cu and Ni
2. Zn and Cu
3. Al and Zn
4. Al, Zn and Ni
Correct Answer :-
Al and Zn
25) Rusting of iron is catalysed by which of the following
[Question ID = 24023]
1. Fe
2. Zn
   H^{-}
4.
Correct Answer :-
   H^{-}
Topic:- MET_Set2
```

1)



When a p	particle is	settling in	a fluid	under I	Newtonian	condition	s, then	the time	taken	by the p	particle
to attain	its termin	nal velocit	is prop	ortiona	al to [Ques	tion ID =	34423]				

1. (Particle diameter) 0.5
2. Particle diameter
(particle diameter) ² 3.
(Particle diameter) -0.5
Correct Answer :-
(Particle diameter) 0.5
2) If the liberation of valuable mineral is in the coarse size range, the concentration method is [Question ID = 34424]
heavy media separation flotation
sizing classification electrostatic separation
Correct Answer :-
heavy media separation
3) In the differential flotation of Pb-Zn ore, the reagent used to depress sphalerite is [Question ID = 34425]
1. pine oil 2. lime
3. sodium cyanide
4. zinc sulphate
zinc sulphate
4) Separation of materials into products based on the difference in their flow velocities through fluids is termed as [Question ID = 34426]
1. clarification
classification all elutriation
4. sedimentation
Correct Answer :-
• classification

5) 'Xanthates' are used in froth floatation process as a/an [Question ID = 34427]



	1. conditioner		
	2. frother		
	collector activator		
	i. activator		
	Correct Answer :-		
	 collector 		
-			
	6) Cage mill is a type of	[Question ID = 3442 8]	
	1. roll mill		
	2. impact mill		
	3. disc mill		
	4. vibratory mill		
	Correct Answer :-		
-	impact mill	***	
0.00			
	7) Grizzly is used for	[Aneanou in - 34452]	
	1. crushing		
	2. grinding		
	3. screening		
	4. electrostatic separator		
	Correct Answer :-		
	• screening		
-			
		ded after ore dressing operation is also called	[Question ID =
	34430]		
	1. tailing		
	2. flux		
	3. concentrate		
	4. run of mine ore		
	Correct Answer :-		
	tailing		
_			
	9) The concentration of gold or	res is mostly accomplished by [Question	ID = 34431]
	1. tabling		
	2. jigging		
	3. flotation		
	4. elutriation		
	Correct Answer :-		
	tabling		
	10)		_A: TD _ 044007
	10) coal has the highes	st fixed carbon content out of the following? [Que	stion 1D = 34432



į	2. lignite
5	3. anthracite
2	4. semi-bituminous
(Correct Answer :-
	anthracite
1	L1) Construction of thermocouple is based on the principle of [Question ID = 34433]
	1. Peltier effect
-	2. Seebeck effect
1.	3. Thomson effect
4	4. Wein-displacement law
(Correct Answer :-
•	Seebeck effect
1	L2) Bomb calorimeter is used to determine of coal [Question ID = 34434]
	1. moisture content
-	2. volatile matter
	3. calorific value
4	4. Ash content
(Correct Answer :-
0	calorific value
	L3) Water gas is produced with the interaction of hot coke with [Question ID = 34435] 1. steam
	2. air
	3. air and steam
4	1. oxygen and steam
ŝ±	
	Correct Answer :-
•	steam
	L4) Stored is liable to spontaneous ignition
L	[Question ID = 34436]
1	1. diesel oil
2	2. coal
	3. producer gas
2	1. gasoline
(Correct Answer :-

coal

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 2. coal gas 3. blast furnace gas 4. water gas Correct Answer:- water gas 16) Refractrories are not used for the lining of [Question ID = 34438] 1. ingot moulds 2. ladles 3. hot metal mixers 4. soaking pits Correct Answer:- ingot moulds 	
4. water gas Correct Answer:- water gas 16) Refractrories are not used for the lining of [Question ID = 34438] 1. ingot moulds 2. ladles 3. hot metal mixers 4. soaking pits Correct Answer:-	
Correct Answer:- water gas 16) Refractrories are not used for the lining of [Question ID = 34438] 1. ingot moulds 2. ladles 3. hot metal mixers 4. soaking pits Correct Answer:-	
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16) Refractrories are not used for the lining of [Question ID = 34438] 1. ingot moulds 2. ladles 3. hot metal mixers 4. soaking pits Correct Answer:-	
2. ladles 3. hot metal mixers 4. soaking pits Correct Answer:-	
3. hot metal mixers 4. soaking pits Correct Answer:-	
4. soaking pits Correct Answer :-	
Correct Answer :-	
Correct Answer :-	
SECTION AND ADDRESS OF THE PROPERTY OF THE PRO	
17) Fossil fuels are	
[Question ID = 34439]	
1. hydrocarbons	
2. inorganic hydroxides	
3. organic aldehydes	
4. inorganic salts	
Correct Answer :-	
• hydrocarbons	
18) The percentage of nitrogen in is 50% to 55%	
[Question ID = 34440]	
1. coke oven gas	
2. water gas	
3. super gas	
4. producer gas	
Correct Answer :-	
• producer gas	

19)



The equation which describes the variation of equilibrium constant with temperature [Question ID = 34441]
 Vant'Hoff Gibbs-Helmholtz Gibbs –Duhem Kirchhoff
Correct Answer :- • Vant'Hoff
20) The equilibrium percent solubility of diatomic gases in ambient atmosphere is [Question ID = 34442]
1. k.partial pressure of the gas
k. (partial pressure of the gas) ²
k. (partial pressure of the gas) ⁻¹
4. (partial pressure of the gas) ^{0.5}
Correct Answer :-
k. (partial pressure of the gas) ^{0.5}
21) Internal energy (E) represents of all atoms in a system [Question ID = 34443]
 total kinetic energy potential Energy total kinetic and potential energy thermal and kinetic energy
Correct Answer :- • total kinetic and potential energy
22) An ideal solution is one, which obeys [Question ID = 34444]
 Raoult's law Henry's law Sivert's law Gibb's Duhem law
Correct Answer :- Raoult's law
23) When a reaction occurs at constant, no work is done by the system [Question ID = 34445]



 temperature density pressure volume
Correct Answer :- • volume
24) Ellingham diagrams for the formation of metal oxides are plotted as [Question ID = 34446]
∆G° versus 1/T 1.
ΔG° versus $1/T^2$
ΔG° versus $1/T^{0}$ 3.
ΔG° versus T 4.
Correct Answer :-
∆G° versus T •
25) The free energy change for a chemical reaction is [Question ID = 34447]
1. RTInK
2. RInK 3. –RTInK
4. –RInK
Correct Answer :- - RTInK
26) The entropy, when a spontaneous change occurs in an isolated system [Question ID = 34448]
decreases unchanged
3. equal to zero
4. increases
Correct Answer :-
• increases
27) A system is defined as a part of universe [Question ID = 34449]

- 1. selected for consideration
- 2. consisting of solid phase only
- 3. consisting of liquid phase only



4. consisting of gaseous phase only
Correct Answer :- • selected for consideration
28) In blast furnace iron making conditions for desiliconisation are [Question ID = 34450]
 low temperature and basic slag high temperature and basic slag low temperature and acidic slag high temperature and acidic slag
Correct Answer :-
 low temperature and basic slag
29) In MIDREX process the reducing agent is [Question ID = 34451]
1. CO
H ₂
CO + H ₂ 3.
4. coal
Correct Answer :-
CO + H ₂
30) Rimmed steels are used for [Question ID = 34452]
 structurals wires Flats rods

Flats

31) Thickness of skin formed during the solidification of steel is equal to

[Question ID = 34453]

1. constant. Time

constant. Time 2.

constant.(Time)²



constant. (Time) ⁻¹
4.
Correct Answer :-
constant. Time
0
32) Efficiency of blast furnace operation is assessed in terms of [Question ID = 34454]
bey entered of blade farmace operation is assessed in terms of [question 25 = 5 1151]
1. productivity
2. driving rate
coke consumption productivity and coke consumption rate
in productivity and coke consumption rate
Correct Answer :-
productivity and coke consumption rate
33) Steels containing approximately 0.3% C are generally [Question ID = 34455]
1. killed
2. semi-killed
3. capped
4. rimmed
Correct Answer :-
• killed
• Killeu
34) Solution loss reaction occurs in [Question ID = 34456]
34) Solution loss reaction occurs in [Question ID = 34456]
1. LD converter
LD converter Blast furnace
 LD converter Blast furnace coke oven
 LD converter Blast furnace coke oven Regenerators
 LD converter Blast furnace coke oven
 LD converter Blast furnace coke oven Regenerators
 LD converter Blast furnace coke oven Regenerators Correct Answer:-
 LD converter Blast furnace coke oven Regenerators Correct Answer:-
 LD converter Blast furnace coke oven Regenerators Correct Answer:- Blast furnace LD converter is lined with [Question ID = 34457]
 LD converter Blast furnace coke oven Regenerators Correct Answer:- Blast furnace 35) LD converter is lined with [Question ID = 34457] 1. dolomite
 LD converter Blast furnace coke oven Regenerators Correct Answer:- Blast furnace LD converter is lined with [Question ID = 34457]
 LD converter Blast furnace coke oven Regenerators Correct Answer:- Blast furnace 35) LD converter is lined with [Question ID = 34457] dolomite fire clay
 LD converter Blast furnace coke oven Regenerators Correct Answer:- Blast furnace 35) LD converter is lined with [Question ID = 34457] dolomite fire clay Alumina silica
 LD converter Blast furnace coke oven Regenerators Correct Answer:- Blast furnace 35) LD converter is lined with [Question ID = 34457] dolomite fire clay Alumina silica Correct Answer:-
 LD converter Blast furnace coke oven Regenerators Correct Answer:- Blast furnace 35) LD converter is lined with [Question ID = 34457] dolomite fire clay Alumina silica

- 36) Teeming of metal into mould in vacuum causes [Question ID = 34458]
- 1. Inverse segregation in ingots
- 2. gas free ingots



3. sulphur inclusions4. brittleness in ingot	
Correct Answer :-	
gas free ingots	
37) Reducing age	nt used in Pidgeon process is [Question ID = 34459]
1. carbon	
2. hydrogen	
3. Fe-Si	
4. calcium	
Correct Answer :-	
Fe-Si	
	ting process is used for the production of [Question ID = 34460]
1. Cu	
2. Zn	
3. Mg	
4. Ni	
Correct Answer :-	
• Zn	
1. desilverising	
2. dezincing	
3. decopperising	
4. softening	
Correct Answer :-	
 desilverising 	
	ocess, sodium aluminate is formed, the chemical formula is [Question
NaAlO ₃	
1.	
\$100 PM	
NaAlO ₂	
2.	
Na ₂ AlO ₂	
3.	
15002	
Na ₃ AlO ₂	
4.	
Correct Answer :-	



41) The principa	al advantage of flash smelting in copper extraction is [Question ID = 34463]
1. precise process	control
2. versatility	
3. energy conserv	ation
4. low copper loss	es in slag
Correct Answer	
energy conserv	ation
42) Refining of	zinc is carried out by [Question ID = 34464]
1. Liquation	
2. fractional distilla	
3. electrolytic refir	
4. both liquation a	nd fractional distillation
Correct Answer	i-
• both liquation a	nd fractional distillation
43) Electro met	allurgy is involved in extraction of [Question ID = 34465]
1. Iron	
2. aluminum	
2. aluminum3. zinc	
2. aluminum	
 aluminum zinc tin Correct Answer	
2. aluminum3. zinc4. tinCorrect Answeraluminum	;-
2. aluminum3. zinc4. tinCorrect Answeraluminum	
2. aluminum3. zinc4. tinCorrect Answeraluminum	
 aluminum zinc tin Correct Answer aluminum 44) Ti is product	
 2. aluminum 3. zinc 4. tin Correct Answer aluminum 44) Ti is produc TiO₂ 	
 2. aluminum 3. zinc 4. tin Correct Answer aluminum 44) Ti is produc TiO₂ 1. 	
 2. aluminum 3. zinc 4. tin Correct Answer aluminum 44) Ti is produc TiO₂ TiCl₄ TiF₄ 	
 2. aluminum 3. zinc 4. tin Correct Answer aluminum 44) Ti is produc TiO₂ TiCl₄ 2. 	
 2. aluminum 3. zinc 4. tin Correct Answer aluminum 44) Ti is produc TiO₂ 1. TiCl₄ 2. 	



45) Carbonyl process is used for the refining of [Question ID = 34467]
1. Cu
2. Si
3. Ni
4. Zn
Correct Answer :-
• Ni
46) The atomic radius of an FCC crystal (having lattice parameter a) is [Question ID =
34468]
$a\sqrt{2}/2$
1.
$a/2\sqrt{2}$
2.
$a\sqrt{3}/4$
3.
4. a/2
Correct Answer :-
$a/2\sqrt{2}$
47) What is the atomic packing factor of BCC? [Question ID = 34469]
1. 0.74
2. 0.72
3. 0.68
4. 0.82
Correct Answer :-
• 0.68
48) Stacking sequence in FCC is [Question ID = 34470]
1. ADADADAD
1ABABABAB 2ABCABCABC
3ABABCBCBC
4ACCBCABCABC
Correct Answer :-
•ABCABCABC
49) The octahedron has [Question ID = 34471]
1. 4 edges



3. 12 edge:	
4. 16 edge:	5
Correct A	nswer :-
• 12 edge:	
	me-Rothery rules for extensive solid solubility, the atomic diameter of the solute and t
	coms should not differ by more than [Question ID = 34472]
1. 50%	
2. 15%	
3. 2%	
4.0%	
Correct A	nswer :-
• 15%	
51) Gibbs	s phase rule is [Question ID = 34473]
1. F = C+P	
2. $F = C - I$	
3. $F = C + P$	
4. F = C - I	
Correct A	
• F = C -	P+2
52) Pearl	ite is a mixture of [Question ID = 34474]
	on and cementite
	iron and cementite
AND THE RESERVE AND ADDRESS OF THE PARTY OF	nd austenite
	and austenite
Correct A	nswer:-
	on and cementite
- aipila ire	and commende
	a called whater emiliar into thus called whaters are coaling the repetion in [Ougetian ID = 24/
53) If one	e solid phase splits into two solid phases on cooling, the reaction is [Question ID = 344
53) If one 1. eutectic	e solid phase splits into two solid phases on cooling, the reaction is [Question ID = 344
15. 10. 40. 20.00	
1. eutectic	
 eutectic peritectic 	c d
 eutectic peritectic eutectoic 	c d oid

[Question ID = 34476]



-273°C 1.
200°C 2.
-200°C 3.
4. room temperature
Correct Answer :-
room temperature
55) During overageing, hardness [Question ID = 34477]
1. decreases 2. increases
3. is constant
4. increases abruptly
Correct Answer :- • decreases
• decreases
56) Number of slip systems in FCC are [Question ID = 34478]
1. 4 2. 6
3. 8
4. 12
Correct Answer :-
• 12
57) Bragg equation for X-ray diffraction through a metal crystal structure is given by [Question ID = 34479]
$n\lambda = 2d \cos \theta$ 1.
$n\lambda = 2d \sin \theta$
$nd = 2\lambda \sin \theta$ 3.
$\lambda d = 2n \cos \theta$ 4.
Correct Answer :-



58) Which of the following is a low melting point metal? [Question ID = 34480]
 stainless steel wrought iron tin copper
Correct Answer :- • tin
59) The preferred slip plane for FCC is [Question ID = 34481]
(111) 1.
(110) 2.
(100) 3.
(000) 4.
Correct Answer :-
(111) •
60) In an ideal HCP packing, the c/a ratio is [Question ID = 34482]
1. 1.225 2. 1.414 3. 1.633 4. 1.732
Correct Answer :- • 1.633
61) The resolution of an optical microscope is of the order of [Question ID = 34483]
1. 1 nm
l μm 2.
3. 1 mm

 $n\lambda = 2d \sin \theta$



Correct Answer :-	
lum	
Gamma iron occur	rs in the temperature of "C
[Question ID = 34484]	
1. 0 – 770	
2. 770 – 910	
3. 910 – 1400	
4. 1400 - 1539	
Correct Answer :-	
910 – 1400	
53) Crystal structure o	of ferrite is [Question ID = 34485]
1. SC	
2. BCC	
3. FCC	
4. HCP	
Correct Answer :-	
• BCC	
	rs permanent deformation due to application of stress/load, it is calle
1. elastic deformation	
2. plastic deformation	
3. rupture stress	
4. ultimate stress	
4. ultimate stress Correct Answer :-	



line defect



66) Which of the following is not a structure sensitive property of a material [Question ID = 34488]

- 1. ductility
- 2. tensile strength
- 3. density
- 4. yield strength

Correct Answer :-

density

67) The number cycles of stress which a metal can endure before failure is known as [Question ID = 34489]

- 1. damping capacity
- 2. toughness
- 3. malleability
- 4. endurance limit

Correct Answer :-

endurance limit

68) Hook's law [Question ID = 34490]

- 1. applies to the elastic deformation
- 2. applies beyond limit of proportional limit in stress-strain curve
- 3. states that stress is inversely proportional to strain upto elastic limit
- 4. applies to plastic deformation

Correct Answer :-

applies to the elastic deformation

69) Crystal structure of metals is studied by [Question ID = 34491]

- 1. metallographic technique
- 2. X-ray technique
- 3. ultrasonic method
- 4. electron microscopy

Correct Answer :-

X-ray technique

70) Cold working of metals results in [Question ID = 34492]

- 1. increase in strength
- 2. increase in ductility
- 3. decrease in hardness
- 4. decrease in strength

Correct Answer :-

increase in strength



71) Tempering of steel is done to make it [Question ID = 34493]
 Brittle hard rollable soft
Correct Answer :- • soft
72) In edge dislocation, the direction of movement of atoms is [Question ID = 34494]
 parallel to the stress direction perpendicular to the stress direction
at 120° to the stress direction 3.
at 60° to the stress direction
4.
Correct Answer :- parallel to the stress direction
73) If the grain diameter increases, then yield strength of metal [Question ID = 34495]
 decreases increases remains constant increases then decreases
Correct Answer :-
• decreases
74) is dimensionless quantity [Question ID = 34496]
 Stress strain true stress Young's modulus of elasticity
Correct Answer :-
• strain
75) At temperature, the grains and the grain boundaries have equal strength [Question ID = 34497]

- 1. Curie
- 2. equi-cohesive
- 3. recrystallisation
- 4. absolute zero



1. Young's modulus
80) A property that cannot be obtained from a tensile test is [Question ID = 34502]
crack opening mode
Correct Answer :-
4. perpendicular shear mode
3. parallel shear mode
2. forward shear mode
1. crack opening mode
[Question ID = 34501]
79) In fracture toughness characterized by K_{IC} , I in the subscript indicates loading by
• 10mm
Correct Answer :-
2. 2mm 3. 5mm 4. 10mm
78) The standard steel ball diameter used in BHN is [Question ID = 34500] 1. 1mm
79) The standard steel hall diameter used in RHN is [Question ID = 24500]
Small grain size
low stacking fault energy high melting point
small grain size fine dispersoid size
77) Creep resistance of materials decreases due to [Question ID = 34499]
Radiography
4. Fatigue test Correct Answer :-
2. Impact test 3. Tensile test
Radiography
76) Which of the following is not a destructive test? [Question ID = 34498]
 equi-cohesive



2. yield strength3. ultimate tensile strength
4. endurance limit
Correct Answer :-
endurance limit
81) In a tensile test of a ductile material, necking starts at [Question ID = 34503]
1. lower yield stress
2. upper yield stress
 ultimate tensile strength fracture stress
Correct Answer :-
ultimate tensile strength
82) of a material is designated by its Izod value [Question ID = 34504]
1. impact resistance
2. tensile strength
 creep strength hardness
T. Hardiness
Correct Answer :-
impact resistance
83) Sub-zero treatment of steel is carried out for [Question ID = 34505]
1. converting austenite to bainite
2. converting austenite to martensite
converting austenite to pearlite converting austenite to ferrite
Correct Answer :-
 converting austenite to martensite
84) An important property of malleable cast iron in comparison to grey cast iron is the high [Question ID = 34506]
1. compressive strength
2. carbon content
3. ductility
4. surface finish
Correct Answer :-
• ductility
85) Increasing the percentage of cold work, the recrystallization temperature

[Question ID = 34507]



1. increas	ses	
2. decrea	ises	
3. increas	ses then decreases	
4. remair	ns constant	
Correct	Answer :-	
 decrea 	ises	
86) Whi	ich of the following is not a casting defect? [Question ID = 34508]	
1. scab		
2. ingate		
3. hot tea		
4. fin		
Correct	Answer :-	
ingate		
		- 11
87) In v	which of the following welding processes, electrode gets consumed? [Question ID = 34509]	
1. TIG w	elding	
2. resista	ince welding	
3. thermi	t welding	
4. arc we	elding	
Correct	Answer :-	
• arc we	elding	
88) Whi	ich of the following is not a fusion welding process? [Question ID = 34510]	
1. arc we	eldina	
2. gas we		
Military - Annahit - Annahi	ince welding	
	n stir welding	
Correct	Answer :-	
	n stir welding	
89) Vol	umetric shrinkage of grey cast iron is [Question ID = 34511]	
1. 6 - 10	%	
2. 3.5 – 4	1.5%	
3.2.5 - 3	3%	
4. 1.9% (to negative	
Correct	Answer :-	
• 1.9% t	to negative	
00)		



Carbon is present in the form of graphite flakes in the	cast iron [Question ID = 34512]
 grey white nodular 	
4. malleable	
Correct Answer :- • grey	
91) Draft allowance given to patterns is for [Question ID = 34513]	
1. compensating the liquid state shrinkage	
2. easy removal of pattern from the mold cavity	
providing support for the core placement compensating the solidification shripkage.	
4. compensating the solidification shrinkage	
Correct Answer :-	
easy removal of pattern from the mold cavity	
92) Risers are not required for casting of [Question ID = 34514]	
1. stainless steel	
2. plain carbon steel	
3. grey cast iron	
4. white cast iron	
Correct Answer :-	
Correct Answer :- grey cast iron	
	st iron is [Question ID = 34515]
grey cast iron 93) The element responsible for the presence of free graphite in ca	st iron is [Question ID = 34515]
grey cast iron	st iron is [Question ID = 34515]
 grey cast iron 93) The element responsible for the presence of free graphite in ca 1. sulphur 	st iron is [Question ID = 34515]
 grey cast iron 93) The element responsible for the presence of free graphite in ca 1. sulphur 2. phosphorous 	st iron is [Question ID = 34515]
 grey cast iron 93) The element responsible for the presence of free graphite in ca 1. sulphur 2. phosphorous 3. silicon 	st iron is [Question ID = 34515]
 grey cast iron 93) The element responsible for the presence of free graphite in ca 1. sulphur 2. phosphorous 3. silicon 4. manganese 	st iron is [Question ID = 34515]
 grey cast iron 93) The element responsible for the presence of free graphite in ca 1. sulphur 2. phosphorous 3. silicon 4. manganese Correct Answer:- 	
 grey cast iron 93) The element responsible for the presence of free graphite in ca 1. sulphur 2. phosphorous 3. silicon 4. manganese Correct Answer:- silicon 	
 grey cast iron 93) The element responsible for the presence of free graphite in ca 1. sulphur 2. phosphorous 3. silicon 4. manganese Correct Answer:- silicon 94) Shell moulding employs a pattern made of [Question ID = 3451] 1. plaster of paris 2. wood 	
 grey cast iron 93) The element responsible for the presence of free graphite in ca 1. sulphur 2. phosphorous 3. silicon 4. manganese Correct Answer:- silicon 94) Shell moulding employs a pattern made of [Question ID = 3451] 1. plaster of paris 2. wood 3. metal 	
 grey cast iron 93) The element responsible for the presence of free graphite in ca 1. sulphur 2. phosphorous 3. silicon 4. manganese Correct Answer:- silicon 94) Shell moulding employs a pattern made of [Question ID = 3451] 1. plaster of paris 2. wood 	
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 grey cast iron 93) The element responsible for the presence of free graphite in ca 1. sulphur 2. phosphorous 3. silicon 4. manganese Correct Answer:- silicon 94) Shell moulding employs a pattern made of [Question ID = 3451] 1. plaster of paris 2. wood 3. metal 4. wax 	



 creep fatigue impact tensile Correct Answer:- impact
96) Flux in welding process acts as a [Question ID = 34518]
 catalyst protective agent filler meterial heat generator
Correct Answer :-
 protective agent
97) The most weldable material is [Question ID = 34519]
1. stainless steel
plain carbon steel aluminum
4. brass
Correct Answer :- • plain carbon steel
Correct Answer :- • plain carbon steel
plain carbon steel
plain carbon steel
 plain carbon steel 98) In MIG welding, metal is transformed in the form of [Question ID = 34520] 1. molecules 2. molten drops
 plain carbon steel 98) In MIG welding, metal is transformed in the form of [Question ID = 34520] 1. molecules 2. molten drops 3. weld pool
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 plain carbon steel 98) In MIG welding, metal is transformed in the form of [Question ID = 34520] 1. molecules 2. molten drops 3. weld pool 4. a fine spray of metal Correct Answer :-
 plain carbon steel 98) In MIG welding, metal is transformed in the form of [Question ID = 34520] 1. molecules 2. molten drops 3. weld pool 4. a fine spray of metal Correct Answer:- weld pool
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 plain carbon steel 98) In MIG welding, metal is transformed in the form of [Question ID = 34520] 1. molecules 2. molten drops 3. weld pool 4. a fine spray of metal Correct Answer:- weld pool 99) In arc welding, the arc length should be equal to, where, d = electrode rod diameter
 plain carbon steel 98) In MIG welding, metal is transformed in the form of [Question ID = 34520] 1. molecules 2. molten drops 3. weld pool 4. a fine spray of metal Correct Answer:- weld pool 99) In arc welding, the arc length should be equal to, where, d = electrode rod diameter [Question ID = 34521]
 plain carbon steel 98) In MIG welding, metal is transformed in the form of [Question ID = 34520] 1. molecules 2. molten drops 3. weld pool 4. a fine spray of metal

• d

100) Purpose of riser is to [Question ID = 34522]

1. help feed the casting until all solidification takes place



- 2. act as a cooling device for molten metal
- 3. feed molten metal from pouring basin to gate
- 4. get defective castings

• help feed the casting until all solidification takes place

