Mechanical Engineering_Set2

Topic:- Mathematics_Set2

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

[Question ID = 13593]

1. $\begin{bmatrix}-2 & 2\\ 0 & -6\end{bmatrix}$
2. $\begin{bmatrix}-2 & -2\\ 2 & -4\end{bmatrix}$
3. $\begin{bmatrix}-2 & -2\\ 0 & -6\end{bmatrix}$
4. $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$

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 $A^TBA=$

[Question ID = 13594]

1. $[5]$

2. $[0]$

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

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

Correct Answer :-

- $[5]$

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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 :-

- 0

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

[Question ID = 13596]

1. $x=1$

2. $x=2$

3. $x=0$

4. $x=5$

Correct Answer :-

- $x=1$

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5) 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]

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

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

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

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

Correct Answer :-

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

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6) $\dfrac{x^2}{x^2-3x+2}=$

[Question ID = 13598]

1. $\dfrac{1}{x-1}+\dfrac{2}{x-2}$

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

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

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

Correct Answer :-

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

7) If $Sin\theta+Cosec\theta=2$, then the value of $Sin^3\theta+Cosec^3\theta=$

[Question ID = 13599]

1. 0
2. 1
3. 2
4. 8

Correct Answer :-

- 2

8) 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]

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

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

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

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

Correct Answer :-

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

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

[Question ID = 13601]

1. $\frac{3}{4}$
2. $\frac{\pi}{2}$
3. $\frac{\pi}{4}$
4. 1

Correct Answer :-

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

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

[Question ID = 13602]

1. 2
2. 1
3. 0
4. -1

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]

1. $n\pi\pm\frac{\pi}{2};n\in z$
2. $n\pi\pm\frac{\pi}{3};n\in z$
3. $2n\pi\pm\frac{\pi}{2};n\in z$
4. $n\pi\mp\frac{\pi}{4};n\in z$

Correct Answer :-

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

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

[Question ID = 13605]

1. 5
2. 1
3. 2

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 :-

- 0

16) 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

Correct Answer :-

- 4

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

[Question ID = 13609]

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

Correct Answer :-

- $\frac{1}{2}$

18) Angle between the lines $3x-5y-9=0;\ 4x-y+7=0$ is

[Question ID = 13610]

1. $\theta=30^0$
2. $\theta=45^0$
3. $\theta=60^0$
4. $\theta=15^0$

Correct Answer :-

- $\theta = 45^0$

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19)

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

[Question ID = 13611]

1. $x^2 + y^2 + 4x - 2y - 15 = 0$
2. $x^2 + y^2 + 4x - 2y - 30 = 0$
3. $x^2 + y^2 + x - 2y - 45 = 0$
4. $x^2 + y^2 + 4x - 2y - 45 = 0$

Correct Answer :-

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

---

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

[Question ID = 13612]

1. $\frac{7}{4}$
2. $\frac{\sqrt{7}}{4}$
3. $\frac{5}{4}$
4. $\frac{5}{3}$

Correct Answer :-

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

21) $\underset{x\to 0}{Lim}\frac{8^x-2^x}{x}=$

[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]

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

Correct Answer :-

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

23)

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

[Question ID = 13615]

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

Correct Answer :-

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

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

[Question ID = 13616]

1. 1
2. 0
3. x
4. $\frac{1}{\sqrt{1+x^2}}$

Correct Answer :-

- 0

25) At $\theta = \frac{\pi}{4}$, the slope of the normal to the curve $x = aCos^3\theta$; $y = aSin^3\theta$ is

[Question ID = 13617]

1. -1
2. -2
3. 2
4. 1

Correct Answer :-

- 1

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

[Question ID = 13618]

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

Correct Answer :-

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

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27) Equation of the tangent to the curve $y = 5x^4$ at the point (1,5) is

[Question ID = 13619]

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

2. $y = 20x - 15$

3. $x = 15y - 20$

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

Correct Answer :-

- $y = 20x - 15$

28) 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

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

[Question ID = 13621]

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

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

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

4. $\frac{b}{a}e^{(b+ce^x)}+C$

Correct Answer :-

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

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

[Question ID = 13622]

1. $\tan^{-1}x + C$
2. $\cot^{-1}x+C$
3. log(secx)tanx + C
4. log $(\tan^{-1}x)$ + C

Correct Answer :-

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

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

[Question ID = 13623]

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

Correct Answer :-

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

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

[Question ID = 13624]

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

Correct Answer :-

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

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

[Question ID = 13625]

1. $\sec x + \cot x$
2. $\cos ecx - \cot x$
3. $\cos ecx + \tan x$
4. $\sec x - \cos ecx$

Correct Answer :-

- $\sec x - \operatorname{cosec} x$

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34) $\int_0^{\pi/4} \frac{e^{\tan x}}{\cos^2 x} dx$

[Question ID = 13626]

1. $e-1$
2. $e^{-1}-1$
3. $e^{-1}+1$
4. $e^{-2}-1$

Correct Answer :-

- $e-1$

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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

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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]

1. $4\pi ab^2$

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

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

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

Correct Answer :-

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

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

[Question ID = 13629]

1. $y = Ce^x$

2. $y = Ce^y$

3. $y = xe^{cx}$

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

Correct Answer :-

- $y = xe^{cx}$

38) 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]

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

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

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

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

Correct Answer :-

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

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

[Question ID = 13631]

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

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

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

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

Correct Answer :-

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

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40) The solution of $Cosx\, dy = (Sinx - y)ydx$

[Question ID = 13632]

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

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

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

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

Correct Answer :-

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

41) 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]

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

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

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

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

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]

1. $y = c_1e^{2x} + c_2e^{3x} + e^{x}$

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

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

4. $y = e^x$

Correct Answer :-

- $y = e^x$

43) The solution of $(y\log x - 2)ydx = xdy$

[Question ID = 13636]

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

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

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

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

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]

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

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

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

4. $P(E_1 \cup E_2) = P(E_1) + P(E_2) - P(E_1 \cup E_2)$

Correct Answer :-

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

46) The solution of the initial value problem $\frac{d^2x}{dt^2} - 3\frac{dx}{dt} + 2x = 0;$ with $x(0) = 2; \quad x'(0) = 0$ is

[Question ID = 23975]

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

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

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

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

Correct Answer :-

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

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

[Question ID = 23976]

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

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

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

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

Correct Answer :-

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

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

[Question ID = 23977]

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

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

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

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

Correct Answer :-

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

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49)

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

$f(x)=\dfrac{a_0}{2}+\sum_{n=1}^{\infty}\left(a_n Cos\, nx + b_n Sin\, nx\right)$, then $a_0=$

[Question ID = 23978]

1. $\dfrac{1}{\pi}$
2. 1
3. 0
4. $\dfrac{2}{\pi}$

Correct Answer :-

- $\dfrac{2}{\pi}$

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50)

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

[Question ID = 23979]

1. $e^{-3t}\cos 4t$
2. $e^{3t}\sin 4t$

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

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

Correct Answer :-

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

Topic:- Physics_set2

1) The physical quantity having the dimension $[ML^2T^{-3}]$ is

[Question ID = 34198]

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

Correct Answer :-

- power

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

[Question ID = 34199]

1. $[MLT^{-3}]$ and $[MLT^{-4}]$

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

3. $[MLT^{-3}]$ and $[MLT^{4}]$

4. $[MLT^{-4}]$ and $[MLT^{-1}]$

Correct Answer :-

- $[MLT^{-3}]$ and $[MLT^{-4}]$

3)

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. $60°$
4. $0°$

Correct Answer :-

- $60°$

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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. $45°$
4. $90°$

Correct Answer :-

- $90°$

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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. $60°$

4. $90°$

Correct Answer :-

- $30°$

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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

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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

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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]

1. $-9.8\ ms^{-1}$

2. $-58.8\ ms^{-1}$

3. $-4.9\ ms^{-1}$

4. $-29.4\ ms^{-1}$

Correct Answer :-

- $-29.4\ ms^{-1}$

9) The walls of hall built for music concerts should [Question ID = 34206]

1. amplify sound
2. reflect sound
3. transmit sound
4. absorb sound

Correct Answer :-

- absorb sound

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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

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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]

1. $Tan^{-1}\mu$
2. $Tan^{-1}(1/\mu)$
3. $Tan^{-1}(m/\mu)$
4. $Tan^{-1}(\mu/m)$

Correct Answer :-

- $Tan^{-1}\mu$

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12)

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 = 34209]

1. $9.8\ ms^{-1}$
2. $19.6\ ms^{-1}$
3. $39.2\ ms^{-1}$
4. $98\ ms^{-1}$

Correct Answer :-

- $19.6\ ms^{-1}$

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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

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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

Correct Answer :-

- 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 $0.1 Wm^{-2}$. 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 m^3. 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

Correct Answer :-

- 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 $kg^{-1}K^{-1)}$

[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. $H_1 T_1 + H_2 T_2 = 0$

Correct Answer :-

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

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_c' is critical angle, 'i' is incident angle)

[Question ID = 34222]

1. light moves from rarer to denser medium and $i > i_c$
2. light moves from denser to rarer medium and $i > i_c$
3. light moves from rarer to denser medium and $i < i_c$
4. 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

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

1. -1, 0, +1
2. -3, -2, -1, 0, +1, +2, +3
3. 0, +1, +2, +3
4. -2, -1, 0, +1, +2

Correct Answer :-

- -3, -2, -1, 0, +1, +2, +3

2) Among LiCl, $BeCl_2$, BCl_3 and CCl_4, the covalent character follows the order:

[Question ID = 24000]

1. $LiCl > BeCl_2 > BCl_3 > CCl_4$
2. $LiCl < BeCl_2 < BCl_3 < CCl_4$
3. $LiCl > BeCl_2 < BCl_3 > CCl_4$
4. $LiCl < BeCl_2 < BCl_3 > CCl_4$

Correct Answer :-

- $LiCl < BeCl_2 < BCl_3 < CCl_4$

3) Lowest oxidation state in its compound is exhibited by

[Question ID = 24001]

1. N
2. O
3. C
4. F

Correct Answer :-

- F

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

[Question ID = 24002]

1. NH_4Cl
2. $K_3[Fe(CN)_6]$
3. $CuSO_4$
4. NH_4Cl, $CuSO_4$ and $K_3[Fe(CN)_6]$

Correct Answer :-

- NH_4Cl, $CuSO_4$ and $K_3[Fe(CN)_6]$

5) Molarity 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 $H_2C_2O_4.2H_2O$ required to prepare 500mL of 0.2 N solution is

[Question ID = 24004]

1. 1.26 g
2. 6.3g
3. 1.575g
4. 3.15g

Correct Answer :-

- 6.3g

7) The conjugate base of hydrogen molecule is [Question ID = 24005]

1. Electron
2. Hydride ion
3. Proton
4. Hydroxide ion

Correct Answer :-

- Hydride ion

8) p^H of a solution is 1. It is diluted by $1X\ 10^3$ times. The p^H of the resulting solution will be

[Question ID = 24006]

1. 1
2. 3
3. 4
4. 5

Correct Answer :-

- 4

9) Which of the following is a basic flux

[Question ID = 24007]

1. $Na_2B_4O_7$

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]

1. 0.25 mole of Ag

2. 16 gms of Cu

3. 2gms of O_2 (g)

4. 2.8 lit of H_2 at STP

Correct Answer :-

- 16 gms of Cu

13) . Given standard electrode potentials

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

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

The standard electrode potential E^0 for $Fe^{3+} + e^- \text{ -----> } Fe^{2+}$ 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 mg/L, $Ca(HCO_3)_2$ = 162 mg/L, $MgCl_2$ = 95 mg/L and $CaSO_4$ = 136 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_2SO_4

Correct Answer :-

- **CO**

21) Ozone layer of upper atmosphere is being destroyed by

[Question ID = 24019]

1. Photochemical oxidants like O_2 and CO_2
2. **Chloro fluorocarbon**
3. **Smog**
4. SO_2

Correct Answer :-

- **Chloro fluorocarbon**

22) Eutrophication causes reduction in [Question ID = 24020]

1. Dissolved salts
2. Dissolved hydrogen
3. Dissolved oxygen
4. Dissolved solids

Correct Answer :-

- Dissolved oxygen

23) Which one of the chemical substance is maximum in natural gas [Question ID = 24021]

1. CH_4
2. C_2H_6
3. H_2
4. $CO+CO_2$

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**
3. O_2
4. H^+

Correct Answer :-

- H^+

Topic:- Mech_Set2

1) The Lathe bed structures are made of----------material [Question ID = 34223]

1. mild steel
2. Grey cast iron
3. hard steel
4. stainless steel

Correct Answer :-

- Grey cast iron

2) Soft grade grinding wheels are represented by the letters [Question ID = 34224]

1. A to H
2. I to M
3. N to S
4. T to Z

Correct Answer :-

- A to H

3) Hammers are specified by [Question ID = 34225]

1. length of handle
2. thickness of face
3. weight
4. width of flat face

Correct Answer :-

- weight

4) The purpose of dies used in fitting trade is to [Question ID = 34226]

1. cutting internal threads
2. making external threads
3. filing
4. finishing

Correct Answer :-

- making external threads

5) The cutting saw blade which is very thin and stiffened with a thick back strip is [Question ID = 34227]

1. tenon saw
2. rip saw
3. compass saw
4. coping saw

Correct Answer :-

- tenon saw

6) The carbon content in HSS tool is [Question ID = 34228]

1. 0.3%

2. 0.4%
3. 0.7%
4. 0.03%

Correct Answer :-

- 0.7%

7) The advantage of adaptive control used in CNC is [Question ID = 34229]

1. improves machinabilty
2. improves surface finish
3. adjust feed rate depending upon cutting tool conditions and work piece
4. improves stability

Correct Answer :-

- adjust feed rate depending upon cutting tool conditions and work piece

8) In shaper, the forward stroke is -----and the return stroke is-------- [Question ID = 34230]

1. fast, slow
2. slow, fast
3. smooth, jumps
4. fast, smooth

Correct Answer :-

- slow, fast

9) An arbor is used to [Question ID = 34231]

1. guide the job
2. support the milling machine
3. control the feed motion
4. hold the milling cutter

Correct Answer :-

- hold the milling cutter

10) Machining a flat surface which is perpendicular to the axis of the cutter is known as [Question ID = 34232]

1. gang milling
2. face milling
3. saw milling
4. helical milling

Correct Answer :-

- face milling

11) Arc blow occurs predominantly in [Question ID = 34233]

1. Gas welding
2. Gas cutting

3. AC arc welding
4. DC arc welding

Correct Answer :-

- DC arc welding

12) In hot working process [Question ID = 34234]

1. scale is formed on metal surface
2. good surface finish is produced
3. close tolerances can be maintained
4. ductility is decreased

Correct Answer :-

- scale is formed on metal surface

13) Weld penetration is increased by [Question ID = 34235]

1. Increasing welding current and welding speed
2. increasing welding current and decreasing welding speed
3. decreasing welding current and welding speed
4. decreasing welding current and increasing welding speed

Correct Answer :-

- increasing welding current and decreasing welding speed

14) For welding of thin plates, the power source used is [Question ID = 34236]

1. DCSP
2. AC
3. DCRP
4. Half wave AC

Correct Answer :-

- DCRP

15) Carburizing flame is used to weld [Question ID = 34237]

1. Magnesium
2. Stainless steel
3. Brass
4. Nickel

Correct Answer :-

- Nickel

16) The flux in submerged arc welding is in the form of [Question ID = 34238]

1. Granules
2. core wires
3. coating on the electrode
4. Paste

Correct Answer :-

- Granules

17) Casting defect caused by mixing of two streams of molten metal that are too cold to fuse properly is [Question ID = 34239]

1. scab
2. swell
3. cold shuts
4. shrinkage

Correct Answer :-

- cold shuts

18) In arc welding process, the voltage and current are 25V and 300A respectively. The arc heat transfer efficiency is 0.85 and welding speed is 8mm/sec. The net heat input approximately (in J/mm) is [Question ID = 34240]

1. 900
2. 650
3. 850
4. 800

Correct Answer :-

- 800

19) Misrun is a casting defect which occurs due to [Question ID = 34241]

1. very high pouring temperature of the metal
2. insufficient fluidity of the molten metal
3. absorption of gases by the liquid metal
4. improper alignment of the mould flasks

Correct Answer :-

- insufficient fluidity of the molten metal

20) In DC Welding, the straight polarity (electrode negative) results in [Question ID = 34242]

1. lower penetration
2. lower deposition rate
3. less heating of work piece
4. smaller weld pool

Correct Answer :-

- lower penetration

21) Addition of Vanadium to steel results in improvement of [Question ID = 34243]

1. heat treatability by quenching
2. hardenability
3. fatigue strength
4. resistance to oxidation at elevated temperature

Correct Answer :-

- hardenability

22) Nodular grey cast iron is obtained from the grey cast iron by adding small amount of [Question ID = 34244]

1. Manganese
2. phosphorous
3. magnesium
4. chromium

Correct Answer :-

- magnesium

23) The correct sequence of elements of 18-4-1 HSS tool is [Question ID = 34245]

1. W,Cr,V
2. Mo,Cr,V
3. Cr,Ni,C
4. Cu,Zn,Sn

Correct Answer :-

- W,Cr,V

24) The materials with the following crystal structures are more ductile [Question ID = 34246]

1. BCC
2. Cubic
3. HCP
4. FCC

Correct Answer :-

- FCC

25) The percentage of carbon in medium carbon steel usually varies between [Question ID = 34247]

1. 0.3 to 0.7%
2. 2.5 to 4 %
3. 1 to 2%
4. 5 to 7%

Correct Answer :-

- 0.3 to 0.7%

26) Tempering is a process of annealing [Question ID = 34248]

1. martensite at low temperature
2. martensite at high temperatures
3. bainite at low temperature
4. bainite at high temperatures

Correct Answer :-

- martensite at low temperature

27) Primary object of full annealing is to [Question ID = 34249]

1. increase toughness and yield point
2. reduce ductility and resilience
3. remove foreign impurities and improve surface finish
4. increase ductility and machinability

Correct Answer :-

- increase ductility and machinability

28) If carbon present in cast iron is mostly in the form of flakes, it is known as [Question ID = 34250]

1. white cast iron
2. grey cast iron
3. malleable iron
4. nodular iron

Correct Answer :-

- grey cast iron

29) For the analysis of internal defects the method used is [Question ID = 34251]

1. magnetic particle testing
2. radiography
3. liquid penetration test
4. eddy current testing

Correct Answer :-

- radiography

30) The degradation of Mechanical properties leading to failure of a component due to cyclic loading is called [Question ID = 34252]

1. breaking
2. yielding
3. creeping
4. fatigue

Correct Answer :-

- fatigue

31) A body having similar properties throughout its volume is said to be [Question ID = 34253]

1. homogeneous
2. isotropic
3. isentropic
4. anisotropic

Correct Answer :-

- homogeneous

32) The dimensions of Young's modulus of elasticity are [Question ID = 34254]

1. MLT
2. MLT^{-1}
3. $ML^{-1}T^{-2}$
4. $ML^{-2}T^{-2}$

Correct Answer :-

- $ML^{-1}T^{-2}$

33) The shear stress on principal plane is [Question ID = 34255]

1. maximum
2. minimum
3. zero
4. not known

Correct Answer :-

- zero

34) The maximum shear stress is equal to the [Question ID = 34256]

1. sum of the principal stresses
2. difference of the principal stresses
3. half of the sum of principal stresses
4. half of the difference of principal stresses

Correct Answer :-

- half of the difference of principal stresses

35) The bending moment diagram for a cantilever beam subjected to moment at the end of beam will be [Question ID = 34257]

1. rectangle
2. triangle
3. parabola
4. cubic parabola

Correct Answer :-

- rectangle

36) The maximum bending moment caused by a large number of equally spaced identical loads on a simply supported beam is [Question ID = 34258]

1. $wL^2/6$
2. $wL^2/8$
3. $wL^2/16$
4. $wL^2/24$

Correct Answer :-

- $wL^2/8$

37) The shear force at the free end of a cantilever beam subjected to UDL is [Question ID = 34259]

1. maximum
2. zero
3. $wL^2/4$
4. $wL^2/8$

Correct Answer :-

- zero

38) Simple bending equation is [Question ID = 34260]

1. M/I=E/R=f/y
2. M/I=R/E=f/y
3. M/R=I/E=f/y
4. M/y=R/f=I/E

Correct Answer :-

- M/I=E/R=f/y

39) The phenomenon of slow and progressive deformation with time at high temperature is called [Question ID = 34261]

1. breaking
2. yielding
3. creeping
4. fatigue

Correct Answer :-

- creeping

40) The maximum shear stress occurs on [Question ID = 34262]

1. principal planes
2. 45^0 with principal planes
3. 90^0 with principal planes
4. independent of the principal planes

Correct Answer :-

- 45^0 with principal planes

41) Use of flexible coupling is [Question ID = 34263]

1. To prevent shock transmission and to eliminate stress reversals
2. Causes stress concentration
3. Increases coefficient of friction
4. Decreases power loss

Correct Answer :-

- To prevent shock transmission and to eliminate stress reversals

42) The bolts in a rigid flanged coupling connecting two shafts transmitting power are subjected to [Question ID = 34264]

1. Shear force and bending moment
2. Axial force
3. Torsion
4. Torsion and bending moment

Correct Answer :-

- Shear force and bending moment

43) The type of gears used to connect two intersecting co-planar shafts is

[Question ID = 34265]

1. Straight spur gears
2. straight bevel gears
3. cross helical gears
4. spiral gears

Correct Answer :-

- straight bevel gears

44) Automobile gears are generally made of [Question ID = 34266]

1. phosphor bronze
2. high speed steel
3. chrome-manganese steel
4. malleable cast iron

Correct Answer :-

- chrome-manganese steel

45) In the gear box of an automobile, which gear train is used [Question ID = 34267]

1. simple gear train
2. compound gear train
3. epicyclic gear train
4. compound epicyclic gear train

Correct Answer :-

- compound gear train

46) When the belt is stationary the initial tension will be

[Question ID = 34268]

1. $(T_1-T_2)/2$
2. $(T_1+T_2)/2$
3. $T_1/2$
4. $T_2/2$

Correct Answer :-

- $(T_1+T_2)/2$

47) The maximum efficiency of the screw jack is

[Question ID = 34269]

1. (1-sinØ)/(1+sinØ)
2. (1-cosØ)/(1+cosØ)
3. 1/(1+sinØ)
4. 1-cosØ

Correct Answer :-

- (1-sinØ)/(1+sinØ)

48) Due to variations in load on the engine, fuel supply is controlled by a [Question ID = 34270]

1. D-slide valve
2. governor
3. flywheel
4. Meyer's expansion valve

Correct Answer :-

- governor

49) Product of diametral pitch and module is equal to [Question ID = 34271]

1. π
2. 1
3. $1/\pi$
4. 2π

Correct Answer :-

- 1

50) Type of gears used in a differential of an automobile are [Question ID = 34272]

1. straight bevel gears
2. spiral bevel gears
3. double helical gears
4. mitre gears

Correct Answer :-

- straight bevel gears

51) Heat and work are [Question ID = 34273]

1. intensive properties
2. extensive properties
3. point functions
4. path functions

Correct Answer :-

- path functions

52) Consider a refrigerator and a heat pump working on the reversed Carnot cycle between the same temperature limits. Which of the following is correct? [Question ID = 34274]

1. COP of refrigerator=COP of heat pump
2. COP of refrigerator= COP of heat pump+1
3. COP of refrigerator= COP of heat pump-1
4. COP of refrigerator= 1/COP of heat pump

Correct Answer :-

- COP of refrigerator= COP of heat pump-1

53) If a closed system is undergoing an irreversible process, the entropy of the system [Question ID = 34275]

1. must increase
2. always remains constant
3. must decrease
4. may vary

Correct Answer :-

- must increase

54) With increasing temperature of intake air, IC engine efficiency [Question ID = 34276]

1. decreases
2. increases
3. remains same
4. depends on other factors

Correct Answer :-

- decreases

55) Knocking tendency in a SI engine reduces with increasing [Question ID = 34277]

1. compression ratio
2. wall temperature
3. supercharging
4. engine speed

Correct Answer :-

- engine speed

56) Air-standard efficiency of an otto cycle is given by [Question ID = 34278]

1. $1-(1/r)^{\gamma-1}$

2. $1-(1/r)^{\gamma}$

3. $1-(1/r)^{\gamma+1}$

4. $1-(1/r)^{1/\gamma}$

Correct Answer :-

- $1-(1/r)^{\gamma-1}$

57) Thermal efficiency of an I.C engine is in the range of [Question ID = 34279]

1. 10 to 15%
2. 20 to 35%
3. 50 to 65%
4. 70 to 85%

Correct Answer :-

- 20 to 35%

58) The highest temperature in a gas turbine plant is restricted to [Question ID = 34280]

1. 1200^0 C

2. 1000^0 C

3. 800^0 C

4. 500^0 C

Correct Answer :-

- 1000^0 C

59) A perpetual motion machine of first kind is an imaginary device which delivers work continuously [Question ID = 34281]

1. with work as input
2. with heat as input
3. either heat or work as input
4. without any input

Correct Answer :-

- without any input

60) Enthalpy of a pure substance is defined as [Question ID = 34282]

1. H=U-RT/m
2. H=U-PV
3. H=U+PV
4. H=U+PV/T

Correct Answer :-

- H=U+PV

61) A fluid is said to be Newtonian fluid when the shear stress is [Question ID = 34283]

1. directly proportional to the velocity gradient
2. inversely proportional to the velocity gradient
3. independent of the velocity gradient
4. square of the velocity gradient

Correct Answer :-

- directly proportional to the velocity gradient

62) Navier stoke's equation represents the [Question ID = 34284]

1. Energy
2. mass
3. pressure
4. momentum

Correct Answer :-

- momentum

63) Kaplan turbine is [Question ID = 34285]

1. a high head mixed flow turbine
2. a low head axial flow turbine
3. an outward flow reaction turbine
4. an impulse inward flow turbine

Correct Answer :-

- a low head axial flow turbine

64) In order to have maximum power from a Pelton turbine, the bucket speed must be [Question ID = 34286]

1. equal to the jet speed
2. equal to half of the jet speed
3. equal to twice the jet speed
4. independent of the jet speed

Correct Answer :-

- independent of the jet speed

65) Cavitation in a hydraulic reaction turbine is most likely to occur at the turbine [Question ID = 34287]

1. entry
2. exit
3. stator exit
4. rotor exit

Correct Answer :-

- rotor exit

66) Specific speed of Kaplan turbine ranges between [Question ID = 34288]

1. 30 to 60
2. 60 to 300
3. 300 to 600
4. 600 to 1000

Correct Answer :-

- 300 to 600

67) The dimensions of dynamic viscosity μ is

[Question ID = 34289]

1. $ML^{-1}T^{-2}$
2. MLT^{-2}
3. $ML^{-1}T^{-1}$

4. L^2T^{-1}

Correct Answer :-

- $ML^{-1}T^{-1}$

68) The hydraulic efficiency of a turbine is defined as the ratio of [Question ID = 34290]

1. power available at the turbine shaft to that supplied to it by the runner
2. power supplied by the runner to the power available
3. power utilized
4. power utilized by runner to that supplied at the entry

Correct Answer :-

- power available at the turbine shaft to that supplied to it by the runner

69) Gauge pressure in flow system can be measured by [Question ID = 34291]

1. manometer
2. vaccum guage
3. anemometer
4. barometer

Correct Answer :-

- manometer

70) Which of the following device is used to transmit rotating power? [Question ID = 34292]

1. fluid coupling
2. dynamometer
3. hydraulic turbine
4. pump

Correct Answer :-

- fluid coupling

71) Rankine efficiency is defined as the ratio of [Question ID = 34293]

1. Total useful heat drop/adiabatic heat drop
2. enthalpy drop in the turbine/heat supplied
3. enthalpy drop in condenser/heat supplied
4. enthalpy drop in the pump/heat supplied

Correct Answer :-

- enthalpy drop in the turbine/heat supplied

72) An economizer---------- the steam raising capacity of a boiler

[Question ID = 34294]

1. Increases

2. decreases

3. has no effect on

4. has less effect on

Correct Answer :-

- Increases

73) With the increase in pressure the temperature of steam formation will [Question ID = 34295]

1. increase
2. decrease
3. remain constant
4. becomes zero

Correct Answer :-

- increase

74) In a impulse turbine, when steam flows through the moving blades [Question ID = 34296]

1. velocity increases
2. velocity decreases
3. pressure decreases
4. velocity remains constant

Correct Answer :-

- velocity decreases

75) The blade shape in impulse turbine is [Question ID = 34297]

1. profile type
2. circular
3. aerofoil type
4. straight

Correct Answer :-

- profile type

76) In pressure compounded impulse turbine, the ratio of blade velocity to steam velocity [Question ID = 34298]

1. Increases
2. decreases
3. remains constant
4. fluctuates

Correct Answer :-

- remains constant

77) Thermal efficiency in a steam boiler will be in the range of [Question ID = 34299]

1. 80 to 90%
2. 50 to 60%
3. 40 to 50%
4. 20 to 30%

Correct Answer :-

- 80 to 90%

78) A device, whose function is to heat feed water by utilizing the heat in the exhaust flue gases before leaving through the chimney is called [Question ID = 34300]

1. Superheater
2. economizer
3. air preheater
4. ID fan

Correct Answer :-

- economizer

79) Within the boiler, the temperature of steam is highest in [Question ID = 34301]

1. Water drum
2. water tanks
3. water walls
4. super heater

Correct Answer :-

- super heater

80) Steam leaves the steam nozzle at [Question ID = 34302]

1. low pressure and low velocity
2. high pressure and high velocity
3. high pressure and low velocity
4. low pressure and high velocity

Correct Answer :-

- low pressure and high velocity

81) The refrigerant Freon-12 is chemically [Question ID = 34303]

1. CCl_2F_2

2. CCl_3F

3. $CClF_3$

4. $CHClF_2$

Correct Answer :-

- CCl_2F_2

82) 1 ton of refrigeration effect is equal to [Question ID = 34304]

1. 3.5kJ/s
2. 55kJ/S
3. 200kJ/S
4. 210kJ/S

Correct Answer :-

- 3.5kJ/s

83) For air with a relative humidity of 80% [Question ID = 34305]

1. the dry bulb temperature is less than the wet bulb temperature
2. the dew point temperature is less than wet bulb temperature
3. the dew point and wet bulb temperatures are equal
4. the dry bulb and dew point temperatures are equal

Correct Answer :-

- the dew point temperature is less than wet bulb temperature

84) The evaporator coils in the refrigerating chamber [Question ID = 34306]

1. compresses the refrigerant
2. expands the refrigerant
3. rejects the heat
4. absorbs the heat

Correct Answer :-

- absorbs the heat

85) The formation of frost on cooling coils in a refrigerator [Question ID = 34307]

1. Increases heat transfer
2. improves C.O.P of the system
3. increases power consumption
4. reduces power consumption

Correct Answer :-

- increases power consumption

86) Otto cycle efficiency is greater than Diesel cycle efficiency for [Question ID = 34308]

1. Same maximum pressure and temperature
2. same compression ratio and heat supplied
3. same maximum pressure and heat input
4. only heat input

Correct Answer :-

- Same maximum pressure and temperature

87) The ratio of volume of the fluid occupied before compression to the volume of the fluid occupied after compression is called [Question ID = 34309]

1. mean effective pressure
2. thermal efficiency
3. compression ratio
4. mechanical efficiency

Correct Answer :-

- compression ratio

88) Carnot cycle consists of [Question ID = 34310]

1. two isothermal and two isentropic processes
2. two isobaric and two isentropic processes
3. two isochoric and two isentropic processes
4. one isobaric, one isochoric and two isentropic processes

Correct Answer :-

- two isothermal and two isentropic processes

89) In motor cars, the brake commonly used is [Question ID = 34311]

1. shoe brake
2. band brake
3. band and block brake
4. internal expanding shoe brake

Correct Answer :-

- internal expanding shoe brake

90) Carburetor of a spark ignition engine supplies petrol and [Question ID = 34312]

1. diesel
2. air
3. lubricating oil
4. hot compressed air

Correct Answer :-

- air

91) The word Kanban is most appropriately associated with [Question ID = 34313]

1. economic order quantity
2. just-in-time production
3. capacity planning
4. product design

Correct Answer :-

- just-in-time production

92) As per the principles of motion economy, which one of the following is NOT a pivot for a classified movement of human body? [Question ID = 34314]

1. Knee
2. Elbow
3. Torso
4. Wrist

Correct Answer :-

- Knee

93) Ishikawa diagram represents [Question ID = 34315]

1. different types of quality defects
2. Quantitative relation between extent of defect and a process parameter
3. Relation between defects and their causes
4. Prioritized quality defects

Correct Answer :-

- Relation between defects and their causes

94) Scheduling is [Question ID = 34316]

1. allotting a job to an operator
2. allotting a job to a machine
3. fixing the time of completion of a job
4. detailing the sequence of operation -job wise and machine wise

Correct Answer :-

- detailing the sequence of operation -job wise and machine wise

95) Principles related to the use of human body and arrangement of the work place is known as [Question ID = 34317]

1. motion study
2. work study
3. time study
4. motion economy

Correct Answer :-

- motion economy

96) Gantt chart provides information on [Question ID = 34318]

1. proper utilization of men and machine
2. proper flow of material
3. production schedule
4. material handling devices

Correct Answer :-

- production schedule

97) The economic order quantity is obtained by the quantity, whose procurement cost is equal to inventory carrying cost, in [Question ID = 34319]

1. inventory control
2. perpetual inventory control
3. A-B-C Analysis
4. scheduling

Correct Answer :-

- inventory control

98) Large inventories are permitted in case of [Question ID = 34320]

1. A and B items
2. only B items
3. B and C items
4. only C items

Correct Answer :-

- only C items

99) In PERT analysis a critical activity has [Question ID = 34321]

1. maximum float
2. Zero float
3. maximum cost
4. minimum cost

Correct Answer :-

- Zero float

100) Time taken by a trained worker to perform an operation, while working a steady pace is known as [Question ID = 34322]

1. standard time
2. normal time
3. representative time
4. usual time

Correct Answer :-

- standard time