

KARNATAKA DCET

Question Paper - 2022



This question paper has been compiled on the basis of question paper shared by students after the exam. However, answers are unofficial.

MATHEMATICS

$$\int \frac{1}{1 - \sin x} dx =$$

(A) $\tan x - \sec x + c$

(B) $\tan x + \sec x + c$

(C) $\sec x - \tan x + c$

(D) $-\sec x - \tan x + c$

Q1.

Correct answer : B

$$\int \frac{e^{\sin x}}{\sec x} dx =$$

(A) $e^{\sin x} + c$

(B) $e^{\cos x} + c$

(C) $e^x + c$

(D) $-e^{\sin x} + c$

Q2.

Correct answer : A

$$\int \sin^{-1}(x) \cdot dx =$$

(A) $x \sin^{-1}(x) - \sqrt{1 - x^2} + c$

(B) $\frac{1}{\sqrt{1 - x^2}} + c$

(C) $x \sin^{-1}(x) + \sqrt{1 - x^2} + c$

(D) $x \cos^{-1}(x) + \sqrt{1 - x^2} + c$

Q3.

Correct answer : A

$$\int x^2 \cdot \cos x \cdot dx =$$

(A) $x^2 \sin x + 2x \cos x + 2 \sin x + c$
~~(B) $x^2 \sin x - 2x \cos x - 2 \sin x + c$~~
 (C) $x^2 \sin x - 2x \cos x + 2 \sin x + c$
 (D) $x^2 \sin x + 2x \cos x - 2 \sin x + c$

Q4.

Correct answer : B

$$\int x \cdot \sin 2x \cdot dx =$$

(A) $\frac{-x \cos 2x}{2} + \frac{\sin 2x}{4} + c$
 (B) $\frac{x \cos 2x}{2} + \frac{\sin 2x}{2} + c$
 (C) $\frac{x \cdot \cos 2x}{2} - \frac{\sin 2x}{2} + c$
 (D) $\frac{-x \cos 2x}{2} - \frac{\sin 2x}{4} + c$

Q5.

Correct answer : A

Q6.

The value of $\int_0^{\pi/2} 2 \sin 3x \cos x \, dx =$

(A) 0
 (B) -1
 (C) 2
 (D) 1

Correct answer : D

Q7.

The area enclosed by the curve $y = x^2 - 1$ between the ordinates $x = 1$ and $x = 2$ and the x-axis is

(A) $\frac{3}{4}$ sq.unit

(B) 4 sq.unit

(C) 3 sq.unit

(D) $\frac{4}{3}$ sq.unit

Correct answer : D

Q8.

The differential equation formed from the equation $y = a \cos \omega t$ by eliminating the arbitrary constant a is _____

(A) $\frac{d^2y}{dx^2} - \omega^2 y = 0$

(B) $\frac{d^2y}{dx^2} + a^2\omega^2 y = 0$

(C) $\frac{d^2y}{dx^2} + \omega^2 y = 0$

(D) $\frac{d^2y}{dx^2} - a^2\omega^2 y = 0$

$\frac{dy}{dx} = -a \sin \omega t$

Correct answer : C

Q9.

The solution for the differential equation $xdy + ydx = 0$ is _____

(A) $xy = k$

(B) $\frac{x}{y} = k$

(C) $\frac{y}{x} = k$

(D) $x^2 + y^2 = c$

Correct answer : A

Q10.

The integral factor of the linear differential equation $\frac{dy}{dx} + Py = Q$ is

(A) $e^{\int Q dx}$ (B) $e^{\int P dx}$

(C) $e^{\int \frac{1}{P} dx}$ (D) $e^{\int \frac{1}{Q} dx}$

Correct answer : B

If $A = \begin{bmatrix} 1 & 2 \\ 3 & 0 \\ 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 4 \\ 1 & 3 \\ 0 & -7 \end{bmatrix}$ then $A + 2B$ is

(A) $\begin{bmatrix} 5 & 10 \\ 5 & 6 \\ 2 & -13 \end{bmatrix}$ (B) $\begin{bmatrix} -5 & -10 \\ 5 & 6 \\ 2 & -13 \end{bmatrix}$

(C) $\begin{bmatrix} 10 & 5 \\ 6 & 5 \\ 13 & 2 \end{bmatrix}$ (D) $\begin{bmatrix} 5 & 10 \\ 5 & 6 \\ -2 & 13 \end{bmatrix}$

Q11.

Correct answer : A

Q12.

If $A = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 \\ 0 & 3 \end{bmatrix}$ then AB is

(A) $\begin{bmatrix} 1 & 1 \\ 6 & 9 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 9 \\ 6 & 1 \end{bmatrix}$

(C) $\begin{bmatrix} 1 & 6 \\ 1 & 9 \end{bmatrix}$ (D) $\begin{bmatrix} -1 & -6 \\ 1 & 9 \end{bmatrix}$

Correct answer : C

Q13. If $A = \begin{bmatrix} -2 & 1 \\ 3 & 1 \end{bmatrix}$ then $\text{adj } A$ is _____

(A) $\begin{bmatrix} -2 & 3 \\ 1 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} -2 & 1 \\ 1 & 3 \end{bmatrix}$

(C) $\begin{bmatrix} -2 & 1 \\ 3 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} 1 & -1 \\ -3 & -2 \end{bmatrix}$

Correct answer : D

Q14.

The characteristic roots of the matrix $A = \begin{bmatrix} 2 & -1 \\ 0 & 3 \end{bmatrix}$ is

(A) -2 and -3 (B) 2 and 3

(C) 3 and -2 (D) -3 and 2

Correct answer : B

Q15.

If $\begin{vmatrix} x+1 & 2 \\ 4 & x-1 \end{vmatrix} = 0$ then the value of x is

(A) 9 (B) 0

(C) ± 3 (D) -9

Correct answer : C

Q16.

The solution for x and y using Cramer's rule is given by _____

(A) $\frac{\Delta}{\Delta x}, \frac{\Delta}{\Delta y}$

(B) $\frac{\Delta x}{\Delta}, \frac{\Delta}{\Delta y}$

(C) $\frac{\Delta}{\Delta x}, \frac{\Delta y}{\Delta}$

~~(D) $\frac{\Delta x}{\Delta}, \frac{\Delta y}{\Delta}$~~

Correct answer : D

Q17.

The characteristic equation of the matrix $A = \begin{bmatrix} -4 & 1 \\ 2 & 3 \end{bmatrix}$ is _____

(A) $\lambda^2 + \lambda - 12 = 0$

~~(B) $\lambda^2 + \lambda - 14 = 0$~~

(C) $\lambda^2 + \lambda - 10 = 0$

(D) $\lambda^2 + 7\lambda - 14 = 0$

Correct answer : B

Q18.

If $A = (1, 2, -3)$ and $B = (2, 4, 1)$ then $|\overrightarrow{AB}|$ is

(A) $\sqrt{19}$

(C) $i + 2j + 4k$

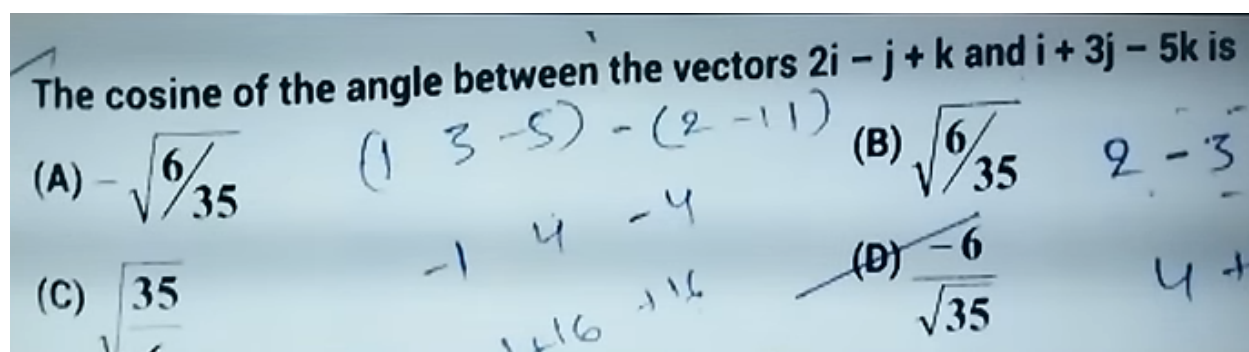
$\vec{AB} = OB - OA$
 $(2, 4, 1) - (1, 2, -3)$
 $\sqrt{1, 2, 4}$

~~(B) $\sqrt{21}$~~

(D) $i - 2j - 4k$

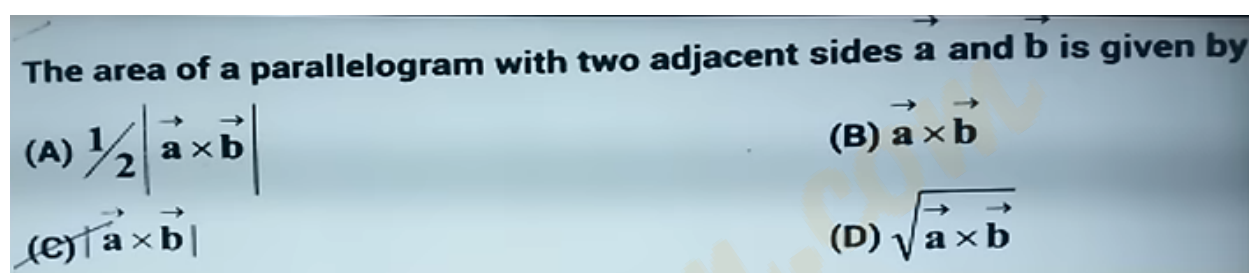
Correct answer : B

Q19.



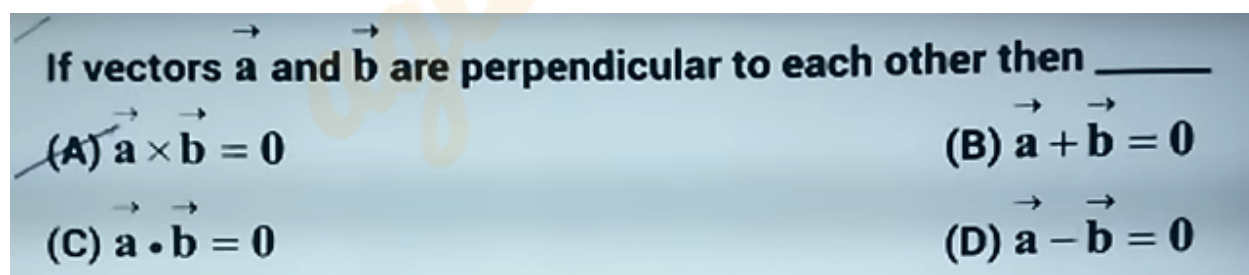
Correct answer : A

Q20.



Correct answer : C

Q21.



Correct answer : C

Q22.

The number of possible outcomes when two dice are rolled at a time is _____

(A) 36

(B) 24

(C) 6

(D) 4

Correct answer : A

Q23.

If $\sin \theta = \frac{3}{5}$ and $\frac{\pi}{2} < \theta < \pi$ then the value of $\tan \theta$ is

(A) $-\frac{4}{5}$

$90^\circ < \theta < 180^\circ$

(B) $-\frac{3}{4}$

(C) $-\frac{4}{3}$

(D) $\frac{4}{5}$

Correct answer : B

Q24.

The value of $\cos (780^\circ)$ is _____

(A) $-\frac{1}{2}$

$\cos(60 \times 2) + 60^\circ$
 $\cos 120^\circ$
 $-\frac{1}{2}$

(B) 1

(C) -1

(D) $\frac{1}{2}$

Correct answer : D

Q25.

The expansion formula for $\cos (A + B)$ is

(A) $\cos A \cos B + \sin A \sin B$

☒ (B) $\cos A \cos B - \sin A \sin B$

(C) $\sin A \cos B + \cos A \sin B$

(D) $\sin A \cos B - \cos A \sin B$

Correct answer : B

Q26.

If $\sin \theta = \frac{1}{2}$ then the value of $\sin 3\theta$ is

(A) $\frac{3}{2}$

(B) -1

(C) $\frac{1}{2}$

(D) 1

Correct answer : D

Q27.

The product form of $\sin C - \sin D$ is

(A) $2 \cos \left(\frac{C+D}{2} \right) \sin \left(\frac{C-D}{2} \right)$

(B) $2 \sin \left(\frac{C+D}{2} \right) \sin \left(\frac{C-D}{2} \right)$

(C) $2 \sin \left(\frac{C+D}{2} \right)$

(D) $2 \cos \left(\frac{C+D}{2} \right) \cos \left(\frac{C-D}{2} \right)$

Correct answer : A

Q28.

The value of $2\cos 80^\circ \cdot \cos 40^\circ$ is

(A) $\frac{1 + \cos 40^\circ}{2}$ (B) $\frac{1}{2} + \cos 40^\circ$

(C) $-\frac{1}{2} + \cos 40^\circ$ (D) $\frac{1 - \cos 40^\circ}{2}$

Correct answer : C

Q29.

If $\sin \theta = \frac{-5}{13}$, $\pi < \theta < \frac{3\pi}{2}$, then the value of $\frac{13 \cos \theta + 5 \operatorname{cosec} \theta}{5 \cot \theta - 12 \sec \theta}$ is

(A) 0 (B) 1

(C) -1 (D) 2

Correct answer : C

Q30.

If $\tan (\theta/2) = t$, then the value of $\sin \theta$ is

(A) $\frac{2t}{1-t^2}$ (B) $\frac{1+t^2}{1-t^2}$

(C) $\frac{2t}{1+t^2}$ (D) $\frac{1-t^2}{1+t^2}$

Correct answer : C

Q31.

The polar form of $Z = 1 - i$ is

(A) $\sqrt{2} \left[\cos \frac{\pi}{4} - i \sin \frac{\pi}{4} \right]$ (B) $\sqrt{2} \left[\cos \frac{\pi}{4} + i \sin \frac{\pi}{4} \right]$

(C) $\sqrt{2} \left[\sin \frac{\pi}{4} + i \cos \frac{\pi}{4} \right]$ (D) $\sqrt{2} \left[\sin \frac{\pi}{4} - i \cos \frac{\pi}{4} \right]$

Correct answer : A

The value of $\text{Lt}_{n \rightarrow \infty} \left[\frac{(n+1)(n-2)}{n^2} \right]$ is

(A) 1 (B) -1

(C) 0 (D) -2

Q32.

Correct answer : A

The value of $\text{Lt}_{x \rightarrow a} \left[\frac{\sqrt{x} - \sqrt{a}}{x - a} \right]$ is

(A) $\frac{1}{2\sqrt{a}}$ (B) $\frac{1}{\sqrt{a}}$

(C) $\sqrt{a}$ (D) $2\sqrt{a}$

Q33.

Correct answer : A

Q34.

The value of $\lim_{\theta \rightarrow 0} \left[\frac{\cos(3\theta) - \cos\theta}{\theta^2} \right]$ is

(A) 16 (B) 4
(C) -16 (D) -4

Handwritten solution:

$$\frac{\cos(3\theta) - \cos\theta}{\theta^2} = \frac{\cos(3\theta) - \cos(2\theta) + \cos(2\theta) - \cos\theta}{\theta^2}$$

$$= \frac{-2\sin\theta \sin\theta + 2\sin\theta \sin\theta}{\theta^2} = \frac{-2\sin^2\theta + 2\sin^2\theta}{\theta^2} = \frac{0}{\theta^2} = 0$$

$$\lim_{\theta \rightarrow 0} 0 = 0$$

Correct answer : D

Q35.

The value of $\lim_{x \rightarrow 1} \left(\frac{x^m - 1}{x^n - 1} \right)$ is _____

(A) $\frac{m}{n}$ (B) x^{m-n}
(C) $\frac{n}{m}$ (D) 1

Handwritten solution:

$$\lim_{x \rightarrow 1} \left(\frac{x^m - 1}{x^n - 1} \right) = \frac{m}{n}$$

Correct answer : A

Q36.

The x-intercept and y-intercept of the line $3x - 4y + 1 = 0$ are

(A) $\frac{1}{3}$ and $\frac{1}{4}$ (B) $-\frac{1}{3}$ and $-\frac{1}{4}$
(C) $-\frac{1}{3}$ and $\frac{1}{4}$ (D) $\frac{1}{3}$ and $-\frac{1}{4}$

Handwritten solution:

$$3x - 4y + 1 = 0$$

$$3x - 4y = -1$$

$$\frac{3x}{3} - \frac{4y}{4} = \frac{-1}{3}$$

$$x - y = -\frac{1}{3}$$

$$x = y - \frac{1}{3}$$

$$3\left(y - \frac{1}{3}\right) - 4y = -1$$

$$3y - 1 - 4y = -1$$

$$-y = 0$$

$$y = 0$$

$$x = 0 - \frac{1}{3} = -\frac{1}{3}$$

$$x = -\frac{1}{3}$$

$$y = \frac{1}{4}$$

Correct answer :C

Q37.

The equation of the line passing through the points (1, -2) and (2, 1) is

(A) $3x + y + 5 = 0$

(B) $3x - y + 5 = 0$

(C) $3x - y - 5 = 0$

(D) $x + 3y - 5 = 0$

Correct answer : C

Q38.

The angle of inclination of the line $x + y - 2 = 0$ is

(A) $\frac{-\pi}{4}$

(B) $\frac{\pi}{4}$

(C) $\frac{3\pi}{4}$

(D) $\frac{-3\pi}{4}$

Correct answer : C

Q39.

If $y = 4x^3 - 2x^2 + x - 6$, then value of $\frac{dy}{dx}$ at $x = 1$ is _____

(A) -9

(B) 9

(C) 17

(D) 15

Correct answer : B

Q40.

If $y = e^x \tan x$ then $\frac{dy}{dx}$ is

(A) $e^x(\sec^2 x - \tan x)$ (B) $e^x(\sec^2 x + \tan^2 x)$
(C) $e^x(\sec^2 x - \tan^2 x)$ (D) $e^x(\sec^2 x + \tan x)$

Handwritten note: $e^x \cdot \sec^2 x - \tan x \cdot e^x = e^x(\sec^2 x - \tan x)$

Correct answer : D

Q41.

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

(A) $\frac{\cos(\log x)}{x}$ (B) $\frac{\sin(\log x)}{x}$
(C) $\frac{x}{\cos(\log x)}$ (D) $\frac{x}{\sin(\log x)}$

Handwritten note: $\cos(\log x) \cdot \frac{1}{x}$

Correct answer : A

Q42.

If $x^3 + y^3 = a^3$ then $\frac{dy}{dx}$ is _____

(A) $\frac{x^2}{y^2}$ (B) $-\frac{x^2}{y^2}$
(C) $-\frac{y^2}{x^2}$ (D) $\frac{y^2}{x^2}$

Handwritten note: $3x^2 + 3y^2 \cdot \frac{dy}{dx} = 0 \Rightarrow \frac{dy}{dx} = -\frac{x^2}{y^2}$

Correct answer : B

Q43.

If $y = (\tan x)^x$ then $\frac{dy}{dx}$ is

(A) $x \cdot \tan x^{x-1}$

(B) $\tan x^x [\log \tan x + x \cot x \sec^2 x]$

(C) $[\log \tan x + x \cot x \sec^2 x]$

(D) $\tan x^x [\sec^2 x]$

Correct answer : B

Q44.

If $y = 2 \cos 3x + 3 \sin 3x$ then $\frac{d^2y}{dx^2}$ is

(A) $\frac{d^2y}{dx^2} - 9y = 0$

(B) $\frac{d^2y}{dx^2} + 3y = 0$

(C) $\frac{d^2y}{dx^2} - 3y = 0$

(D) $\frac{d^2y}{dx^2} + 9y = 0$

Correct answer : D

Q45.

If $y = x^4 + \tan x - \log x$, then $\frac{dy}{dx}$ is _____

(A) $4x^3 + \cot x - \frac{1}{x}$

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

(B) $4x^3 - \cot x - \frac{1}{x}$

(C) $x^3 + \sec^2 x - \frac{1}{x}$

~~(D) $4x^3 + \sec^2 x - \frac{1}{x}$~~

Correct answer : D

Q46.

If $y = (\sin x + \cos x)^2$, then $\frac{dy}{dx}$ is _____

(A) $2 \cos 2x$

(B) $2 (\sin x + \cos x)$

(C) $(\cos x - \sin x)^2$

(D) $2 \sin 2x$

Correct answer : A

Q47.

The equation of normal to the curve $y = f(x)$ at a point (x_1, y_1) is given by

(A) $y - y_1 = \left(\frac{-dy}{dx} \right) (x - x_1)$

(B) $y - y_1 = \frac{dy}{dx} (x - x_1)$

(C) $-(x - x_1) = \frac{dy}{dx} (y - y_1)$

(D) $x + x_1 = \left(\frac{-dy}{dx} \right) (y + y_1)$

Correct answer : C

Q48.

The rate of change of volume of sphere at $r = 3\text{cm}$ when the radius of the sphere changes at the rate of 2cm/s is _____

(A) $24\pi\text{cc/s}$

(B) $48\pi\text{cc/s}$

(C) $12\pi\text{cc/s}$

(D) $72\pi\text{cc/s}$

$\frac{dV}{dt} = 4\pi r^2 \cdot \frac{dr}{dt}$
 $= 4\pi \times 3^2 \times 2$
 $= 72\pi$

Correct answer : D

Q49.

The slope of the tangent to the curve $y = \sin 2x$ at $(\pi/4, 1)$ is _____

(A) 0

(B) 2

(C) 1

(D) -1

Correct answer : A

$$\int (x^3 - \cos x) \cdot dx =$$

(A) $\frac{x^4}{4} + \sin x + c$ (B) $3x^2 + \sin x + c$
(C) $3x^2 - \sin x + c$ (D) $\frac{x^4}{4} - \sin x + c$

Q50.

Correct answer : D

APPLIED SCIENCE

The statement which is correct for laser light is

(A) It has a very high divergence
(B) It cannot be focused to very small spot
(C) It can travel over great distance
(D) It cannot be manipulated with lenses

Q51.

Correct answer : C

Q52.

The prefix nano comes from

(A) French word meaning billion (B) Greek word meaning dwarf
(C) Spanish word meaning particle (D) Latin word meaning invisible

Correct answer : B

Q53.

The loss of strength of a signal while propagating through a medium is known as

- | | |
|-------------------|------------------|
| (A) Attenuation | (B) Transmission |
| (C) Amplification | (D) Reception |

Correct answer : A

Q54.

In an optical fiber, the refractive index of the cladding material should be

- | | |
|----------------------------|----------------------------|
| (A) Nearly unity | (B) Very low |
| (C) Less than that of core | (D) More than that of core |

Correct answer : C

Q55.

In an electromagnetic spectrum, the wave with longest wavelength is _____

- | | |
|----------------|-----------------|
| (A) Microwaves | (B) Gamma rays |
| (C) X-rays | (D) Radio waves |

Correct answer : D

Q56.

The main advantage of fiber optic cable over co-axial cable is _____

- | | |
|-----------------------|-----------------|
| (A) Lesser speed | (B) Higher cost |
| (C) Heavier in weight | (D) Flexible |

Correct answer : D

Oxidation process means

(A) Loss of ions

(B) Gain of ions

(C) Loss of electrons

(D) Gain of electrons

Q57.

Correct answer : C

Corrosion takes place at

(A) Cathode

(B) Anode

(C) Electrolyte

(D) Water

Q58.

Correct answer : B

Q59.

A battery in which the reaction is reversible is

(A) Primary cell

(B) Secondary cell

(C) Fuel cell

(D) Solar cell

Correct answer : B

Q60.

A cell that produces electricity through a chemical reaction without combustion is called

(A) Battery

(B) Fuel cell

(C) Bulb

(D) Engine

Correct answer : A

Q61.

pH of our blood is 7.3 to 7.5 then it is

(A) Strongly acidic

(B) Strongly basic

(C) Neutral

(D) Slightly basic

Correct answer :D

In nature gold exists in

(A) Free state

(B) Combined state

(C) Both A & B

(D) None

Q62.

Correct answer : A

Q63.

The type of composite material that uses filler material as sheet is

(A) Particulate

(B) Short fiber

(C) Long fiber

(D) Laminate

Correct answer : D

Q64.

Bakelite is an example of

(A) Estomer

(B) Fiber

(C) Thermoplastic

(D) Thermosetting plastic

Correct answer : D

Which polymer occurs naturally?

(A) Nylon

(B) Cellulose

(C) Resin

(D) PVC

Q65.

Correct answer : B

Q66.

Steradian is a unit of

(A) Plane angle

(B) Solid angle

(C) Amount of substance

(D) Luminous intensity

Correct answer : B

Q67.

Least count of the vernier calipers is _____ between IMSD and IVSD

(A) Ratio

(B) Sum

(C) Difference

(D) Both A and B

Correct answer : C

Q68.

The pitch scale is divided in $\frac{1}{2}$ mm. For 6 rotation the screw advances 6 divisions on pitch scale. The pitch is _____

(A) 1mm

(B) 1cm

(C) $\frac{1}{2}$ cm

(D) $\frac{1}{2}$ mm

Correct answer : D

Q69.

A force of 20N is inclined at an angle of 30° to horizontal, the vertical component of the force is

- | | |
|----------|--------------------|
| (A) 10 N | (B) $10\sqrt{3}$ N |
| (C) 20 N | (D) $20\sqrt{3}$ N |

Correct answer : A

Q70.

If two equal forces act in the south and west directions, then the resultant acts in the

- | | |
|------------------|------------------|
| (A) South – West | (B) South – East |
| (C) South | (D) West |

Correct answer : A

Q71.

If the force rotates the body in the clockwise direction, its moment is

- | | |
|--------------|--------------|
| (A) Positive | (B) Negative |
| (C) One | (D) Zero |

Correct answer : B

Q72.

Turning of tap is an example of

- | | |
|----------------------|---------------------|
| (A) Couple | (B) Moment of force |
| (C) Angular velocity | (D) Momentum |

Correct answer : a

Q73.

If the smallest division on main scale is 0.5mm and there are 10 divisions on vernier scale, then least count of vernier calipers is _____

- | | |
|---------------|--------------|
| (A) 0.0005 cm | (B) 0.005 cm |
| (C) 0.05 cm | (D) 0.5 cm |

Correct answer :B

Q74.

When 2 equal forces $\vec{P}$ each acts at a point making an angle 120° between them, then the magnitude of the resultant is _____

- | | |
|--------------------------|------------------|
| (A) $2P$ | (B) $\sqrt{2} P$ |
| (C) $\frac{P}{\sqrt{2}}$ | (D) P |

Correct answer : D

Q75.

The tangential force acting per unit area is called

- | | |
|------------------------|--------------------|
| (A) Linear stress | (B) Shear stress |
| (C) Compressive stress | (D) Tensile stress |

Correct answer : B

The reciprocal of bulk modulus is

- | | |
|----------------------|---------------------|
| (A) Hooke's law | (B) Compressibility |
| (C) Factor of safety | (D) Poisson's ratio |

Q76.

Correct answer : B

Q77.

A certain steel bar has a maximum stress of 650 Nmm^{-2} of area of cross section 500 m^2 . The maximum force that the bar can withstand is

- (A) 325 GN (B) 325 KN
(C) 1.3 MN (D) 1.3 N

Correct answer : A

The angle of contact of water with glass is

- (A) 90° (B) $>0^\circ$
(C) 0° (D) $<90^\circ$

Q78.

Correct answer : C

Q79.

The pressure exerted by sea water of density 1025 Kgm^{-3} on a fish at a depth of 40m is (take $g = 9.8 \text{ ms}^{-2}$)

- (A) 401.8 MNm^{-2} (B) 401.8 KNm^{-2}
(C) 401.8 Nm^{-2} (D) 40.18 Nm^{-2}

$$P = \rho gh$$
$$1025 \times 40 \times 9.8$$
$$401800$$

Correct answer : B

Q80.

Addition of detergent to water _____ surface tension

- (A) Decreases (B) Increases
(C) Zero (D) Constant

Correct answer : A

Q81.

When liquid flows over a solid surface the velocity of layer of liquid which is in contact with solid surface is

- | | |
|-------------|--------------|
| (A) Zero | (B) Constant |
| (C) Maximum | (D) Unity |

Correct answer : A

Q82.

As temperature decreases, the viscosity of gas _____

- | | |
|------------------|------------------|
| (A) Becomes zero | (B) Increases |
| (C) Decreases | (D) Remains same |

Correct answer : C

Q83.

The maximum stress of steel wire is 500 Nm^{-2} . If the area of cross section of wire is 0.05 m^2 then force is _____

- | | |
|-------------|------------|
| (A) 2500 N | (B) 1000 N |
| (C) 10000 N | (D) 25 N |

Correct answer : D

Q84.

When heat leaves the body, its _____ decreases

(A) Momentum

(B) Power

(C) Velocity

~~(D) Temperature~~

Correct answer : D

Q85.

In cold countries windows are provided with double doors because

(A) Of security

(B) To strengthen the window

(C) Air between two doors behaves as a perfect conductor

(D) Air between two doors behaves as a perfect insulator

Correct answer : D

Q86.

The process of transmission of heat by the actual movement of particles of medium is

(A) Conduction

(B) Convection

(C) Radiation

(D) Insulation

Correct answer : B

Q87.

The hot water carrying pipes are painted white to avoid _____ of heat radiation.

(A) Emission

(B) Reflection

(C) Absorption

(D) Induction

Correct answer : A

Q88.

Normal pressure in terms of height of mercury is

(A) 760 m

(B) 76 m

(C) 0.76 m

(D) 7.6 m

Correct answer : C

$C_p - C_v = R$ is

(A) Perfect gas equation

(B) Real gas equation

(C) Mayer's equation

Q89. (D) Maxwell's equation

Correct answer : C

Q90.

The product of frequency and time period is equal to

(A) Unity

(B) Zero

(C) Velocity

(D) Wavelength

Correct answer : A

Q91.

The angle between the particle motion and wave propagation in a longitudinal wave is

- | | |
|----------------|----------------|
| (A) 90° | (B) 45° |
| (C) 30° | (D) 0° |

Correct answer : A

Q92.

If a particle executing simple harmonic motion has a displacement $Y = 6 \sin 25t$, then its amplitude is

- | | |
|-------------|--------------|
| (A) 6 units | (B) 25 units |
| (C) 3 units | (D) 50 units |

Correct answer : A

Q93.

As humidity increases, velocity of sound in air

- | | |
|------------------|------------------|
| (A) Increases | (B) Decreases |
| (C) Remains same | (D) Becomes zero |

Correct answer : A

Q94.

If the string vibrates with 2 loops then the frequency of vibration of string is

- (A) Equal to fundamental frequency
- (B) Double the fundamental frequency
- (C) Four times the fundamental frequency
- (D) Half of the fundamental frequency

Correct answer : B

Q95.

Sound of maximum intensity is produced by a body in

(A) Free vibration

(B) Forced vibration

(C) Damped vibration

(D) Resonance

Correct answer : D

Q96.

If 256 Hz and 250 Hz are the frequencies of two waves producing beats, then beat frequency is

(A) 506 Hz

(B) 6 Hz

(C) 256 Hz

(D) 250 Hz

Correct answer : B

Q97.

A wave of frequency 600 MHz travels at a speed of 3×10^8 m/s then the wavelength of the wave is ____

(A) 2 m

(B) 18 m

(C) 0.5 m

(D) 0

Correct answer : C

Q98.

The velocity of sound in a medium of density 'd' and elastic modulus E is

(A) $V = \sqrt{\frac{E}{d}}$

(B) $V = \sqrt{\frac{d}{E}}$

(C) $V = \sqrt{\frac{E}{d^3}}$

(D) $V = \frac{d}{E}$

Correct answer : A

Q99.

A body displaced from its mean position and starts vibrating with its natural frequency is called

- | | |
|----------------------|--------------------|
| (A) Forced vibration | (B) Free vibration |
| (C) Electric wave | (D) Magnetic wave |

Correct answer : B

Q100.

Powerful telescopes like the Hubble space telescope to see far away stars use

- | | |
|---------------|------------------|
| (A) Gama rays | (B) X -rays |
| (C) UV rays | (D) Visible rays |

Correct answer : C