2021-12-14

1.Whenever a hydrogen atom emits a photon in the Balmer series,

it may emit another photon in the Balmer series.

it must emit another photon in Lyman seres.

there is no further emission.

it may or may not emit a second photon.

2.If the value of potential in an ac, circuit is 10V, then the peak value of potential is

$\frac{10}{\sqrt{2}}$

$10\sqrt{2}$

$20\sqrt{2}$

$\frac{20}{\sqrt{2}}$

3.Which of the following statements is wrong?

Sound travels in straight line

Sound is a form of energy

Sound travels in the form of waves

Sound travels faster in vacuum than in air

4.The critical angle between an equilateral prism and air is 45°. If the incident ray is perpendicular to the refracting surface, then

After deviation it will emerge from the second refracting surface

It is totally reflected on the second surface and emerges out perpendicularly from third surface in air

It is totally reflected from the second and third refracting surfaces and finally emerges out from the first surface

It is totally reflected from all the three sides of prism and never emerges out

5.The resistance of a resistance thermometer has values 2.71 and 3.70 ohm at 10°C and 100°C. The temperature at which the resistance is 3.26 ohm is

40°C

50°C

60°C

70°C

6.Water falls from a height of 210m. Assuming whole of energy due to fall is converted into heat the rise in temperature of water would be (J = 4.3 Joule/cal)

42°C

49°C

0.49°C

4.9°C

7.A person is in a room whose ceiling and two adjacent walls are mirrors. How many images are formed

5

6

7

8

8.A bomb is kept stationary at a point. It suddenly explodes into two fragments of masses 1 g and 3g. The total K.E. of the fragments is $6.4 \times 10^4 J$. What is the K.E. of the smaller fragment

$2.5 \times 10^4 J$

$3.5 \times 10^4 J$

$4.8 \times 10^4 J$

$5.2 \times 10^4 J$

9.The relative density of material of a body is found by weighing it first in air and then in water. If the weight in air is (5.00 ± 0.05) Newton and weight in water is (4.00 ± 0.05) Newton. Then the relative density along with the maximum permissible percentage error is

$5.0 \pm 11\%$

$5.0 \pm 1\%$

$5.0 \pm 6\%$

$1.25 \pm 5\%$

10.Equivalent resistance between A and B will be

2 ohm

18 ohm

6 ohm

3.6 ohm

11.Body A of mass 4m moving with speed 2u collides with another body B of mass 2m, at rest. The collision is head on and elastic in nature. After the collision the fraction of energy lost by the colliding body A is :

$\frac{1}{9}$

$\frac{4}{9}$

$\frac{5}{9}$

$\frac{8}{9}$

12.A man can see clearly up to 3 metres. What power of lens will be suitable for his spectacles so that he can see clearly up to 12 metres?

- 3/4 *D*

3 *D*

- 1/4 *D*
- 4 *D*

13.If $f(x) = |x - 2|$ then

$$\lim_{x \to 2+} f(x) \neq 0$$

$$\lim_{x \to 2-} f(x) \neq 0$$

$$\lim_{x \to 2+} f(x) \neq \lim_{x \to 2-} f(x)$$

$f(x)$ is continuous at x = 2

14.If for two matrices X and Y, both XY and $X - Y$ are defined, then

X and Y are both square matrices of same order

X and Y are matrices of same order

Number of columns in X is same as number of columns in Y

None of these

15.For two non-zero co-planar vectors, $\vec{a}$ and $\vec{b}$, if $|\vec{a}+\vec{b}| = |\vec{a}-\vec{b}|$, the angle between them is:

0°

90°

60°

120°

16.The area of triangle formed by $\frac{x}{5}+\frac{y}{6}=1$ with cartesian axes is:

30

15

60

14

17.If A and B are square matrices of order 2, then $(A+B)^2 =$

$A^2+AB+BA+B^2$

$A^2+2BA+B^2$

$A^2+2AB+B^2$

none of these

18.The angle between the lines $xy=0$ is

45°

60°

90°

180°

19.The roots of equation $x^2+2xi-1=0$ are:

real and distinct

complex and distinct

real but identical

complex but identical

20.The determinant $\begin{vmatrix} a & -b & c \\ b & c & -a \\ -c & a & b \end{vmatrix}$ is equal to:

$(a+b+c)^3$

$a^3+b^3+c^3$

$a^3+b^3+c^3+3abc$

$a^3+b^3+c^3-3abc$

21.The coefficient of middle term of $(a+x)^{10}$ is two times that of the second term, when expanded in ascending powers of x. The value of a is:

$\left(\frac{63}{4}\right)^{1/5}$

$\left(\frac{63}{5}\right)^{1/4}$

$\left(\frac{63}{4}\right)^{1/4}$

none of these

22.The terms of a G.P. are positive. If each term is equal to the sum of two terms that follow it, then the common ratio is:

$\frac{\sqrt{5}-1}{2}$

$\frac{1-\sqrt{5}}{2}$

1

$2\sqrt{5}$

23.If α and β are two roots of equation $4x^2-8x+10=0$, then $\frac{\alpha^2+\beta^2}{\alpha^2-\beta^2}=$

12

$1/12$

$12i$

$i/12$

24. $\begin{vmatrix} b+c & a & a \\ b & c+a & b \\ c & c & a+b \end{vmatrix} =$

abc

2abc

3abc

4abc

25.The minimum value of $2x^2 + x - 1$ is:

$-\frac{1}{4}$

$\frac{3}{2}$

$\frac{-9}{8}$

$\frac{9}{4}$

26.The co-ordinates of the point where the line through $P(3,\ 4,\ 1)$ and $Q(5, 1, 6)$ crosses the *xy*-plane are

$\frac{3}{5}, \frac{13}{5}, \frac{23}{5}$

$\frac{13}{5}, \frac{23}{5}, \frac{3}{5}$

$\frac{13}{5}, \frac{23}{5}, 0$

$\frac{13}{5}, 0,\ 0$

27.If a, b, c are coplanar vectors, then

$$\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix} = 0$$

$$\begin{vmatrix} a & b & c \\ a\,.\,a & a\,.\,b & a\,.\,c \\ b\,.\,a & b\,.\,b & b\,.\,c \end{vmatrix} = 0$$

$$\begin{vmatrix} a & b & c \\ c\,.\,a & c\,.\,b & c\,.\,c \\ b\,.\,a & b\,.\,c & b\,.\,b \end{vmatrix} = 0$$

$$\begin{vmatrix} a & b & c \\ a\,.\,b & a\,.\,a & a\,.\,c \\ c\,.\,a & c\,.\,c & c\,.\,b \end{vmatrix} = 0$$

28.The slope of tangent to the curve $x = t^2 + 3t - 8, y = 2t^2 - 2t - 5$ at the point (2, –1) is

11/7

6/7

-6

None of these

29.The number of sigma and pi bonds in a molecule of benzene is

9 sigma and 3 pi

6 sigma and 9 pi

12 sigma and 3 pi

6 sigma and 6 pi

30.IUPAC name of $CH_3 - CH = CH - COOH$ is

2-butenoic acid

1-butenoic acid

1-carboxy -1-propene

None of the above

31.Which of the following has highest octane number ?

n-hexane

n-heptane

n-pentane

2, 2, 4-trimethyl pentane

32.At $298K$ a $0.1M\ CH_3COOH$ solution is 1.34% ionized. The ionization constant K_a for acetic acid will be

1.82×10^{-5}

18.2×10^{-5}

0.182×10^{5}

None of these

33.The solubility product of $BaSO_4$ is 1.3×10^{-9} . The solubility of this salt in pure water will be

$1.69 \times 10^{-9} mol\, litre^{-1}$

$1.69 \times 10^{-18} mol\, litre^{-1}$

$3.6 \times 10^{-18} mol\, litre^{-1}$

$3.6 \times 10^{-5} mol\, litre^{-1}$

34.Calculate the number of sulphate ions in 100mL of 0.001M ammonium sulphate solution.

6.022×10^{-19}

6.022×10^{19}

6.022×10^{20}

6.022×10^{-20}

35.Equilibrium coonstants K1 and K2 for the following equilibria is $NO(g) + \frac{1}{2}O_2 \overset{K_1}{\longrightarrow} NO_2(g)$ and $2NO_2(g) \overset{K2}{\longrightarrow} NO(g) + O_2(g)$

$K_2 = \frac{1}{K_1}$

$\mathrm{K_2 = K_1^2}$

$K_2 = \frac{K_1}{2}$

$K_2 = \frac{1}{K_1^2}$

36.Which of the following compound is formed when a gas obtained by reacting H_2SO_4 with excess of P_4O_{10} is treated with anhydrous HCl ?

Chlorosulphonic acid

Hypochlorous acid

Sulphur

Phosphine

37.'I don't have her number.'

Neither do I.

Neither I have.

Neither have I.

So do I.

38.If I’d slept early, I …… late for class.

wouldn’t be

didn’t be

woudn’t have been

wasn’t late

39.Which syllable is stressed in the word ‘sixteen’?

1st

2nd

3rd

4th

40.Pull your socks up

To get ready

To improve

To start

To finish