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1.A stretched rubber has

Increased kinetic energy

Increased potential energy

Decreased kinetic energy

Decreased potential energy

2.The majority charge carriers in P-type semiconductor are

Electrons

Protons

Holes

Neutrons

3.Unit vector parallel to the resultant of vectors $\vec{A} = 4\hat{i} - 3\hat{j}$ and $\vec{B} = 8\hat{i} + 8\hat{j}$ will be

$\frac{24\hat{i} + 5\hat{j}}{13}$

$\frac{12\hat{i} + 5\hat{j}}{13}$

$\frac{6\hat{i} + 5\hat{j}}{13}$

None of these

4.Brilliance of diamond is due to

Shape

Cutting

Reflection

Total internal reflection

5.Two point charges A and B, having charges +Q and –Q respectively, are placed at certain distance apart and force acting between them is F. If 25% charge of A is transferred to B, then force between the charges becomes

F

$\frac{9F}{16}$

$\frac{16F}{9}$

$\frac{4F}{3}$

6.The length of a given cylindrical wire is increased by 100% by stretching. Due to the consequent decrease in diameter the change in the resistance of the wire will be

300%

200%

100%

50%

7.For a colour of light the wavelength for air is 6000 Å and in water the wavelength is 4500 Å. Then the speed of light in water will be

$5. \times 10^{14}\, m/s$

2.25×10^{8}m/s

4.0×10^{8}m/s

Zero

8.The maximum number of possible interference maxima for slit-separation equal to twice the wavelength in Young's double slit experiment is

infinite

five

three

zero

9.A weightless thread can support tension upto 30 *N* . A stone of mass 0.5 *kg* is tied to it and is revolved in a circular path of radius 2 *m* in a vertical plane. If $g = 10m/s^2$, then the maximum angular velocity of the stone will be

$5\ rad/s$

$\sqrt{30}\, rad/s$

$\sqrt{60}\, rad/s$

$10\, rad/s$

10.If the distance between the plates of parallel plate capacitor is halved and the dielectric constant of dielectric is doubled, then its capacity will

Increase by 16 times

Increase by 4 times

Increase by 2 times

Remain the same

11.A radioactive material has a half life of 10 days. What fraction of the material would remain after 30 days?

0.125

0.25

0.33

0.5

12.The magnitude and direction of the current in the circuit shown will be

$\frac{7}{3}A$ from a to b through e

$\frac{7}{3}A$ from b to a through e

$1A$ from a to b through e

$1A$ from b to a through e

13.If one side of a square be represented by the vector $3i + 4j + 5k$, then the area of the square is

12

13

25

50

14.The derivative of x with respect to $\sin^{-1} x$ is:

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

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

$\sqrt{1-x^2}$

none of these

15.If $f(x) = \begin{cases} x \sin \frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$ then $\lim_{x \to 0} f(x) =$

1

0

-1

none of these

16.The sine of the angle between the two vectors $3i + 2j - k$ and $12i + 5j - 5k$ will be

$\frac{\sqrt{115}}{\sqrt{14}\sqrt{194}}$

$\frac{51}{\sqrt{14}\sqrt{144}}$

$\frac{\sqrt{64}}{\sqrt{14}\sqrt{194}}$

None of these

17.If (2, 0) is the vertex and y-axis the directrix of a parabola, then its focus is

(2,0)

(-2,0)

(4,0)

(-4,0)

18.The relation $A \cap B = A \cup B$ is true if

$A \subset B$

$B \subset A$

$A \subset B$ and $B \subset A$

none of the above

19.If θ be the angle between two vectors a and b, then $a.b \geq 0$ if

$0 \leq \theta \leq \pi$

$\frac{\pi}{2} \leq \theta \leq \pi$

$0 \leq \theta \leq \frac{\pi}{2}$

None of these

20.The number of words that can be formed out of the letters of the word ARTICLE so that the vowels occupy even places is

36

574

144

754

21.Sum of infinite number of terms in G.P. is 20 and sum of their square is 100. The common ratio of G.P. is

5

3/5

8/5

1/5

22.If the $4^{th},\ 7^{th}$ and 10^{th} terms of a G.P. be $a,\ b,\ c$ respectively, then the relation between $a,\ b,\ c$ is:

$b = \frac{a+c}{2}$

$a^2 = bc$

$b^2 = ac$

$c^2 = ab$

23.If $\overrightarrow{F_1} = i - j + k, \overrightarrow{F_2} = -i + 2j - k, \overrightarrow{F_3} = j - k, \vec{A} = 4i - 3j - 2k$ and $\vec{B} = 6i + j - 3k$, then the scalar product of $\overrightarrow{F_1} + \overrightarrow{F_2} + \overrightarrow{F_3}$and $\overrightarrow{AB}$ will be

3

6

9

12

24.The general value of θsatisfying the equation $2\sin^2\theta - 3\sin\theta - 2 = 0$ is

$n\pi + (-1)^n \frac{\pi}{6}$

$n\pi + (-1)^n \frac{\pi}{2}$

$n\pi + (-1)^n \frac{5\pi}{6}$

$n\pi + (-1)^n \frac{7\pi}{6}$

25.$\int \{1 + 2\tan x(\tan x + \sec x)\}^{1/2} dx =$

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

$\log(\sec x + \tan x)^{1/2} + c$

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

None of these

26.A unit vector perpendicular to the plane containing the vectors $i - j + k$ and $-i + j + k$ is :

$\frac{i - j}{\sqrt{2}}$

$\frac{i + k}{\sqrt{2}}$

$\frac{j - k}{\sqrt{2}}$

$\frac{i + j}{\sqrt{2}}$

27.If $x + \frac{1}{x} = \sqrt{3}$ then $x =$

$\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}$

$\cos\frac{\pi}{2} + i\sin\frac{\pi}{2}$

$\sin\frac{\pi}{6} + i\cos\frac{\pi}{6}$

$\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}$

28.If $lx + my + n = 0$ is a tangent of parabola $y^2 = 4ax$ then:

$lm = an^2$

$ln = am^2$

$mn = al$

$mn = al^2$

29.The oxidation number of 2 chlorine atoms in bleaching powder are

0,0

+7,-7

-1,-1

+1,-1

30.The oxidation number of sulphur in H_2S is

-2

- 3
- 2

-3

31.When conc.H_2SO_4 comes in contact with sugar, it becomes black due to

Hydrolysis

Hydration

Decolourisation

Dehydration

32.The four quantum number for the valence shell electron or last electron of sodium (Z = 11) is

$n = 2,\ l = 1,\ m = -1,\ s = -\frac{1}{2}$

$n = 3,\ l = 0,\ m = 0,\ s = +\frac{1}{2}$

$n = 3,\ l = 2,\ m = -2,\ s = -\frac{1}{2}$

$n = 3,\ l = 2,\ m = 2,\ s = +\frac{1}{2}$

33.IUPAC name of $(CH_3)_2 - CH - CH = CH - CH_3$ is

2-methyl-3-pentene

4-methyl-2-pentene

1, 2-isopropyl-1-propene

3-isopropyl-2-propene

34.In the reaction $2Na_2S_2O_3 + I_2 \rightarrow Na_2S_4O_6 + 2NaI$, the equivalent weight of $Na_2S_2O_3$ (mol. wt. = *M*) is equal to

M

$M/2$

$M/3$

$M/4$

35.The following equilibrium exists in an aqueous solution of hydrogen sulphide : $H_2S \rightleftarrows H^+ + HS^-$ If dilute HCl is added to an aqueous solution of H_2S without any change in temperature

The equilibrium constant will change

The concentration of HS^- will increase

The concentration of undissociated H_2S will decrease

The concentration of HS^- will decrease

36.What thickness of the copper plating would you expect on a spherical ball of raduis $1cm$ completely dipped in electrolyte on passing $5A$ current for one hour ? $[\rho_{Cu} = 8.96g/cm^3, Mol.Wt._{Cu} = 63.5]$

$0.05cm$

$0.25cm$

$1.55cm$

None of these

37.By the end of the year, she ___ with a degree in business.

already graduates

will have already been graduated

has already graduated

will be graduated

38.The passive voice of 'I sang a song.' is:

A song is sang by me.

A song was sung by me.

A song is being singing by me.

A song is being sung by me.

39.This time next Monday, we …….. in Baglung.

will stay

are staying

stayed

will be staying

40.If she had understood my motive, …… together now.

we would be

we'd be

we would have been

we would have being