2021-12-15

1.The terminal potential difference of a cell is greater than its e.m.f. when it is

Being discharged

In open circuit

Being charged

Being either charged or discharged

2.Which of the following is a slow process?

Isothermal

Adiabatic

Isobaric

Isochoric

3.When strain is produced in a body within elastic limit, its internal energy

Remains constant

Decreases

Increases

None of the above

4.A motorcyclist of mass m is to negotiate a curve of radius r with a speed v. The minimum value of the coefficient of friction so that this negotiation may take place safely, is

v^2rg

$\frac{v^2}{gr}$

$\frac{gr}{v^2}$

$\frac{g}{v^2r}$

5.For a normal eye, the cornea of eye provides a converging power of 40 D and the least converging power of the eye lens behind the cornea is 20 D. Using this information, the distance between the retina and the cornea - eye lens can be estimated to be :

1.53 cm

1.67 cm

2.64 cm

3.20 cm

6.The ratio of specific charge of an α-particle to that of a proton is

1:1

2:1

1:2

4:1

7.When radiation of wavelength λ is incident on a metallic surface, the stopping potential is 4.8 volts. If the same surface is illuminated with radiation of double the wavelength, then the stopping potential becomes 1.6 volts. Then the threshold wavelength for the surface is

2λ

4λ

6λ

8λ

8.The number of photons of wavelength 540 nm emitted per second by an electric bulb of power 100W is (taking h = $6 \times 10^{-34} J \sec$)

100

1000

3×10^{18}

3×10^{20}

9.The magnetic induction in the region between the pole faces of an electromagnet is 0.7 weber/m2. The induced e.m.f. in a straight conductor 10 cm long, perpendicular to B and moving perpendicular both to magnetic induction and its own length with a velocity 2 m/sec is

0.08 *V*

0.14 *V*

0.35 *V*

0.07 *V*

10.The radius of the orbital of electron in the hydrogen atom 0.5 Å. The speed of the electron is $2 \times 10^6\ m/s$. Then the current in the loop due to the motion of the electron is

1 mA

1.5 mA

2.5 mA

1.5*10-2 mA

11.A body of weight 64 N is pushed with just enough force to start it moving across a horizontal floor and the same force continues to act afterwards. If the coefficients of static and dynamic friction are 0.6 and 0.4 respectively, the acceleration of the body will be (Acceleration due to gravity = g)

$\frac{g}{6.4}$
0.64 g

$\frac{g}{32}$
0.2 g

12.For an ac circuit $V = 15 \sin \omega t$ and $I = 20 \cos \omega t$ the average power consumed in this circuit is

300 Watt

150 Watt

75 Watt

zero

13.For $A = \{1, 2, 3\}$ and $B = \{a, b\}$, which of the following represents a function from A to B?

$\{(1, a), (1, b), (2, c)\}$

$\{(1, a), (2, a), (3, a)\}$

$\{(1, a), (2, a), (2, b)\}$

none of these

14.The y intercept of the curve: $y = e^x$ is :

0

1

e

$1/e$

15.The angle between the pair of lines $2x^2 - 4xy - 2y^2 = 0$ is:

0^o

60^o

90^o

none of these

16.The equation of a line through the intersection of lines x=0 and y=0 and through the point (2, 2), is

$y = x - 1$

$y = -x$

$y = x$

$y = -x + 2$

17.If ${}^nP_r = {}^nC_r$, then $r =$

0

1

0,1

2

18.A ladder of length $5m$ rests on a vertical wall, its top being $4m$ above horizontal ground. It slowly moves so that the top falls at the rate of $9mm/s$. The rate at which bottom moves in the horizontal ground is:

$12mm/s$

$9mm/s$

$4mm/s$

none of the above

19.If $\alpha,\ \beta, \gamma$ be the angles which a line makes with the positive direction of co-ordinate axes, then $\sin^2\alpha + \sin^2\beta + \sin^2\gamma =$

2

1

3

0

20.$\tan^{-1}\left(\frac{1}{11}\right) + \tan^{-1}\left(\frac{2}{12}\right) =$

$\tan^{-1}\left(\frac{33}{132}\right)$

$\tan^{-1}\left(\frac{1}{2}\right)$

$\tan^{-1}\left(\frac{132}{33}\right)$

None of these

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

$x+\cos x+c$

$1+\sin x+c$

$\sec x-\tan x+c$

$\sec x+\tan x+c$

22.If $\lim_{x\to 2}\frac{x^n-2^n}{x-2}=80$, where n is a positive integer, then $n=$

3

5

2

none of these

23.If the p^{th} term of an A.P. be q and q^{th} term be p, then its r^{th} term will be:

$p+q+r$

$p+q-r$

$p+r-q$

$p-q-r$

24.The conjugate of the complex number $\frac{2+5i}{4-3i}$ is

$\frac{7-26i}{25}$

$\frac{-7-26i}{25}$

$\frac{-7+26i}{25}$

$\frac{7+26i}{25}$

25.Area bounded by $y = x^2$ and $y = \dfrac{2}{1+x^2}$ is :

$\pi - \dfrac{1}{3}$

$\pi - \dfrac{2}{3}$

$2\pi - \dfrac{1}{3}$

none of these

26.The equation of the plane passing through the intersection of the planes $x + y + z = 6$ and $2x + 3y + 4z + 5 = 0$, and the point $(1, 1, 1)$, is:

$20x + 23y + 26z - 69 = 0$

$20x + 23y + 26z + 69 = 0$

$23x + 20y + 26z - 69 = 0$

None of these

27. $\displaystyle\int \frac{dx}{1+e^x} =$

$\log(1 + e^x)$

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

$-\log(1 - e^{-x})$

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

28.The maximum value of the function $x^3 + x^2 + x - 4$ is

127

4

Does not have a maximum value

None of these

29.

$$C_2H_6(g) + nO_2 \rightarrow CO_2\,(g) + H_2O\,(l)$$

In this equation, the ratio of the coefficients of CO_2 and H_2O is

1 : 1

2 : 3

3 : 2

1 : 3

30.Which will not be hydrolysed

Potassium nitrate

Potassium cyanide

Potassium succinate

Potassium carbonate

31.The molecular weight of water is 18. What is the unit of molecular weight ?

g

mol

$g\,mol^{-1}$

$mol\,g^{-1}$

32.NaOH is manufactured by electrolysis of brine solution. The products of the reaction are

Cl_2 and H_2

Cl_2 and $Na - Hg$

Cl_2 and Na

Cl_2 and O_2

33.The products of reaction of copper and dilute nitric acid are:

$Cu(NO_3)_2 + NO_3 + H_2O$

$Cu(NO_3)_2 + NO + H_2O$

$Cu(NO_3)_2 + NO_2 + H_2O$

$Cu(NO_3)_2 + N_2O + H_2O$

34.The vapour density of a volatile chloride of a metal M is 76.2 . If the specific heat of the metal is 0.64, the molecular formula of the chloride is

MCl

MCl_2

MCl_3

MCl_4

35.The pH of the solution prepared by mixing 0.4g of NaOH with 80 ml of 0.2N HCl is

1.2

2.2

3.2

4.0

36.The ppt of AgCl is dissolved by using NH_3 the product formed is

[Ag(NH_3)]Cl

Ag[(NH_3)$_4$Cl]

[Ag(NH_3)$_3$]Cl

[Ag(NH_3)$_2$]Cl

37.Which sentence is incorrectly punctuated?

The book, which he bought, was expensive.

She said, Hurrah, I have passed the board exam.

He is intelligent, diligent, and witty.

Having finished his office work, the man left for home.

38.Finally I learned how …. a car.

drive

to drive

driving

to be driven

39._____ skin is a sense organ of the body.

A

An

The

None

40.synonym of empirical:

spiritual

royal

theoretical

practical