1.In a movie hall, the distance between the projector and the screen is increased by 1% illumination on the screen is

Increased by 1%

Decreased by 1%

Increased by 2%

Decreased by 2%

2.A ball whose kinetic energy is E, is projected at an angle of 45° to the horizontal. The kinetic energy of the ball at the highest point of its flight will be

E

$\dfrac{E}{\sqrt{2}}$

$\dfrac{E}{2}$

Zero

3.A magnet of magnetic moment M and pole strength m is divided in two equal parts, then magnetic moment of each part will be

M

M/2

M/4

2M

4.With respect to air, critical angle in a medium for light of red colour $[\lambda_1]$ is θ. Other facts remaining same, critical angle for light of yellow colour $[\lambda_2]$ will be

θ

More than θ

Less than θ

$\dfrac{\theta \lambda_1}{\lambda_2}$

5.A metal ball of mass 2 kg moving with a velocity of 36 km/h has an head on collision with a stationary ball of mass 3 kg. If after the collision, the two balls move together, the loss in kinetic energy due to collision is

40J

60J

100J

140J

6.The reading of the ammeter as per figure shown is

$\frac{1}{8}A$

$\frac{3}{4}A$

$\frac{1}{2}A$

2A

7.The ionisation energy of hydrogen atom is 13.6 *eV*. Following Bohr's theory, the energy corresponding to a transition between the 3rd and the 4th orbit is

3.40 *eV*

1.51 *eV*

0.85 *eV*

0.66 *eV*

8.A rocket is fired vertically upward from ground with a resultant vertical acceleration $10m/s^2$. Fuel is finished in 1 minute and it continue move up. The maximum height reached is

36km

18km

54km

42km

9.It is desired to photograph the image of an object placed at a distance of 3m from the plane mirror. The camera which is at a distance of 4.5m from the mirror, should be focussed for a distance of

3m

4.5m

6m

7.5m

10.Three equal charges are placed on the three corners of a square. If the force between q_1 and q_2 is F_{12} and that between q_1 and q_3 is F_{13}, the ratio of magnitudes $\dfrac{F_{12}}{F_{13}}$ is

$1/2$

2

$1/\sqrt{2}$

$\sqrt{2}$

11.A lamp consumes only 50% of peak power in an a.c. circuit. What is the phase difference between the applied voltage and the circuit current?

$\dfrac{\pi}{6}$

$\dfrac{\pi}{3}$

$\dfrac{\pi}{4}$

$\dfrac{\pi}{2}$

12.10 gm of ice at 0°C is mixed with 100 gm of water at 50°C. What is the resultant temperature of mixture?

31.2°C

32.8°C

36.7°C

38.2°C

13.The amplitude of $(1 + i)^2$ is:

2

$\pi/2$

i

none of these

14.If a and b are adjacent sides of a rhombus, then

a.b = 0

a × b = 0

a.a = b.b

None of these

15.

$$\int_1^2 \frac{1}{x^2} e^{-\frac{1}{x}} \, dx =$$

$\sqrt{e} + 1$

$\sqrt{e} - 1$

$\dfrac{\sqrt{e} + 1}{e}$

$\dfrac{\sqrt{e} - 1}{e}$

16.The straight lines $\dfrac{x-1}{1} = \dfrac{y-2}{2} = \dfrac{z-3}{3}$ and $\dfrac{x-1}{2} = \dfrac{y-2}{2} = \dfrac{z-3}{-2}$ are :

Parallel lines

Intersecting at $60°$

Skew lines

Intersecting at right angle

17.The value of $\log_3 e - \log_9 e + \log_{27} e....$ is equal to

$\log_3 2$

$\log_2 3$

$2 \log_3 2$

None of these

18.The angle between the lines represented by the equation $\lambda x^2 + (1 - \lambda)^2 xy - \lambda y^2 = 0$, is

$30°$

$45°$

$60°$

$90°$

19.

$$\int_1^2 e^x \left(\frac{1}{x} - \frac{1}{x^2} \right) dx =$$

$$\frac{e^2}{2} + e$$

$$e - \frac{e^2}{2}$$

$$\frac{e^2}{2} - e$$

None of these

20.
$$1 + x \log_e a + \frac{x^2}{2!}(\log_e a)^2 + \frac{x^3}{3!}(\log_e a)^3 + \ldots =$$

a^x

x

$a^{\log_a x}$

a

21.In the expansion of $\left(y^2 + \dfrac{c}{y} \right)^5$, the coefficient of y will be

$20c$

$10c$

$10c^3$

$20c^2$

22. $\dfrac{d}{dx} \log \tan \left(\dfrac{\pi}{4} + \dfrac{x}{2} \right) =$

cosecx

-cosecx

secx

-secx

23.A ladder 5 m in length is resting against vertical wall. The bottom of the ladder is pulled along the ground away from the wall at the rate of 1.5m/s . The length of the highest point of the ladder when the foot of the ladder 4.0m away from the wall decreases at the rate of

2 m/sec

3m/sec

2.5 m/sec

1.5 m/sec

24.The function $f(x) = \log\left(x + \sqrt{x^2 + 1}\right)$, is

An even function

An odd function

A Periodic function

Neither an even nor odd function

25.If $\vec{r} = xi + yj + zk$ and $xy + yz + zx = 1$, then $|\vec{r} \times (i + j + k)| =$

0

$\sqrt{r^2 - 1}$

$\sqrt{2(r^2 - 1)}$

none of these

26.If $\cos^{-1} x = \sin^{-1} y$, then $x^3 y - y^3 x =$

$\dfrac{1}{4}\sin(4\sin^{-1} y)$

$\dfrac{1}{4}\sin(4\cos^{-1} x)$

$\dfrac{1}{4}\sin(4\sin^{-1} x)$

both (a) and (b)

27.If $2\tan^2\theta = \sec^2\theta$,then the general value of θ is

$n\pi + \dfrac{\pi}{4}$

$n\pi - \dfrac{\pi}{4}$

$n\pi \pm \dfrac{\pi}{4}$

$2n\pi \pm \dfrac{\pi}{4}$

28.The domain of function $\sin^{-1}(\ln(x))$ is:

$[-1, 1]$

$[1, e]$

$(0, e]$

$[1/e, e]$
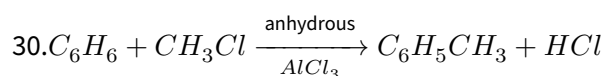
29.Which is the best description of the behaviour of bromine in the reaction given below ? $H_2O + Br_2 \rightarrow HOBr + HBr$

Oxidised only

Reduced only

Proton acceptor only

Both oxidised and reduced

30.$C_6H_6 + CH_3Cl \xrightarrow[AlCl_3]{\text{anhydrous}} C_6H_5CH_3 + HCl$

Friedel-Craft's reaction

Kolbe's synthesis

Wurtz reaction

Grignard reaction

31.Percentage of silver in german silver is:

10%

2%

1%

0%

32.100ml of 1N-$KMnO_4$ solution reacts in alkaline medium with 50ml of 1M oxalic acid solution. After the reaction is over

excess of $KMnO_4$ is left

Excess of oxalic acid is left

neither of the two is left

none of these

33.A current 2.0 A is passed for 5 hours through a molten metal salt deposits 22 g of metal (At. wt. =177). The oxidation state of the metal in the metal salt is

- 1

- 2

- 3

- 4

34.74.5 g of a metallic chloride contain 35.5 g of chlorine. The equivalent weight of the metal is

19.5

35.5

39.0

78.0

35.To deposit 0.6354 *gm* of copper by electrolysis of aqueous cupric sulphate solution, the amount of electricity required (in coulombs) is

9650

4825

3860

1930

36. 0.1 mole of $CH_3NH_2 \left(K_b = 5 \times 10^{-4}\right)$ is mixed with 0.08 mole of HCl and diluted to one litre. What will be the H^+ concentration in the solution?

$8 \times 10^{-2} M$

$8 \times 10^{-11} M$

$1.6 \times 10^{-11} M$

$8 \times 10^{-5} M$

37.Where_____?

did you cut your hair

have you cut your hair

did you have your hair cut

did you have cut your hair

38.The candle was put _____in the wind.

off

through

down

out

39.She bought _____ bed.

a

an

the

40.Write carefully and avoid mistakes ( )

(!)

(?)

(.)

(;)