Que. 1 Which of the following has dimension equal to pressure:

1. Energy/Area
2. Energy/Volume
3. Energy × Area
4. Energy × Volume

Correct Option - **2**

Que. 2 The heat supplied and the work done of a Carnot engine are 4 kJ and 2 kJ respectively. If the minimum temperature is 127°C, then find the maximum temperature.

1. 527°C
2. 627°C
3. 227°C
4. 300°C

Correct Option - **1**

Que. 3 A capillary tube of diameter 2 mm is dipped in a liquid of specific gravity 0.8. The liquid rises in tube by 15 mm making an angle of contact of zero with the tube. Determine the surface tension of the liquid in contact with air and glass tube.

1. 1 kN/m
2. 0.05 kN/m
3. 0.06 N/m
4. 1 N/m

Correct Option - **3**

Que. 4 What happens to the potential difference between the capacitors parallel plates as the distance between parallel plates halved?

1. Decreased
2. Increased
3. Remains constant
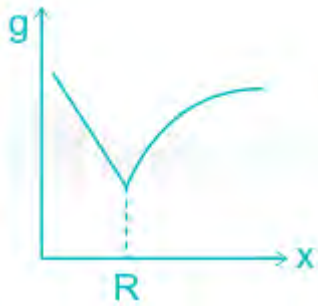4. None of the above

Correct Option - **1**

Que. 5 The relation between the electric field and the magnetic field is

1. $\mu_o \epsilon_o$
2. $\dfrac{1}{\mu_o \epsilon_o}$
3. $\dfrac{1}{\sqrt{\mu_o \epsilon_o}}$
4. $\sqrt{\mu_o \epsilon_o}$

Correct Option - **3**

Que. 6 Variation of acceleration due to gravity (g) with distance x from the centre of the earth is best represented by (R → Radius of the earth)
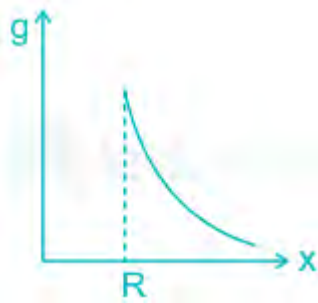
1.

2.

3.

4.

Correct Option **- 4**

Que. 7 In the Stoke's Law formula (F = – 6πηav), 'η' represents _____.
1. Reynold's number
2. pressure
3. viscosity
4. relative density

Correct Option **- 3**

Que. 8 Mutual inductance of a coil is 5H, if current changes from 0 amp to 5 amp. in 10^{-3} sec. then the emf induced in secondary coil-
1. 10 kV

2. 20 kV
3. 25 kV
4. 40 kV

Correct Option - **3**

Que. 9 If the mean life of the radioactive element is 50 days then the half-life of the element will be:
1. 72 days
2. 25 days
3. 50 days
4. 34.65 days

Correct Option - **4**

Que. 10 The SI unit of current is:
1. Ohm (Ω)
2. Volt (V)
3. Ampere (A)
4. Joule (J)

Correct Option - **3**

Que. 11 Which of the following electromagnetic waves have the maximum wavelength:
1. Ultraviolet
2. X-Rays
3. Microwaves
4. Gamma Rays

Correct Option - **3**

Que. 12 The escape velocity on earth is 11.2 km/s. Find the escape velocity on a planet having mass twice that of earth and radius half that of the earth.
1. 11.2 km/s
2. 22.4 km/s
3. 5.6 km/s
4. 0

Correct Option - **2**

Que. 13 What is the CGS unit of electric dipole moment?
1. Coulomb meter
2. statcoulomb-centimetre
3. Joule-centimeter
4. Newton

Correct Option - **2**

Which phenomena show the particle nature of light?

Que. 14 Diffraction

2.   Interference

3.   Photoelectric effect

4.   Polarization

Correct Option **- 3**

Que. 15 The velocity of a particle, executing S.H.M, is _____ at its mean position.

1.   maximum

2.   minimum

3.   infinity

4.   zero

Correct Option **- 1**

Que. 16 Which of the following relationship is **incorrect**? (k is wave number, λ is wavelength, T is time period, ω is angular frequency, and v is wave speed)

1. $k = 2\pi/\lambda$

2. $\omega = 2\pi/T$

3. $\omega = vk$

4. $\omega = 2\pi\lambda$

Correct Option **- 4**

Que. 17 The physical quantities not having same dimensions, are:

1.   Stress and Young's Modulus

2.   Speed and $(\mu_0\varepsilon_0)^{-1/2}$

3.   Torque and work

4.   Momentum and Plank's constant

Correct Option **- 4**

Que. 18 Excess pressure in a soap bubble of radius r is proportional to

1. $1/r$

2. $\frac{1}{r^2}$

3. r

4. r^2

Correct Option **- 1**

Que. 19 Entropy change depends on _____.

1.   Heat transfer

2.   Mass transfer

3.   Change of temperature

4.   Thermodynamic state

Correct Option **- 1**

Que. 20 What is the statement for the second law of thermodynamics?

1. Energy of a system is conserved.
2. All the spontaneous processes result in decreased total entropy of a system.
3. All the spontaneous processes result in increased total entropy of a system.
4. There is no second law of thermodynamics.

Correct Option - **3**

Que. 21 A stone is tied at the end of a string of 2m length and then rotated with a constant angular velocity of 10 rad/sec. The centripetal acceleration of the stone will be:

1. 200 m/s^2
2. 20 m/s^2
3. 2000 m/s^2
4. 2 m/s^2

Correct Option - **1**

Que. 22 Poisson ratio is defined as

1. Lateral strain divided by longitudinal strain
2. Longitudinal strain divided by lateral strain
3. Longitudinal strain divided by shearing strain
4. Lateral strain times longitudinal strain

Correct Option - **1**

Que. 23 Spherical mirror formula relating an object distance 'u', image distance 'v' and focal length of mirror 'f' may be applied to a plane mirror when

1. focal length goes to infinity.
2. focal length goes to zero.
3. image distance goes to zero.
4. image distance goes to infinity.

Correct Option - **1**

Que. 24 A constant force acting on a moving particle does not work on it. It can be necessary inferred that

1. the change in its velocity is zero
2. the change in its acceleration is zero
3. the change in its linear momentum is zero
4. None of these

Correct Option - **1**

Que. 25 The volume occupied by a given mass of a gas at 298 K is 25 mL at 1 atmospheric pressure. Calculate the volume of the gas if the pressure is increased to 1.25 atmosphere keeping temperature constant.

1. 30 ml
2. 20 ml

3. 15 ml

4. 40 ml

Correct Option - **2**

Que. 26 If $\sin \theta + \operatorname{cosec} \theta = 2$ then find $|\sin^2\theta + \operatorname{cosec}^2\theta| = ?$

1. 1

2. 2

3. 0

4. 1/2

Correct Option - **2**

Que. 27 $\int \log 2x \, dx =$ _____

1. $x \log x + c$

2. $x \log 2x + x + c$

3. $x \log 2x - x + c$

4. None of these

Correct Option - **3**

Que. 28 Find the area under the curve between $y = x^2$ and $y = x^3$.

1. 1/2 sq units

2. 1/3 sq units

3. 1/6 sq units

4. 1/12 sq units

Correct Option - **4**

Que. 29 Let $\vec{a} = 2\hat{i} - 3\hat{j} + 4\hat{k}, \vec{b} = 7\vec{i} + 2\vec{j} - 3\vec{k}, \vec{c} = \vec{i} + \vec{j} + \vec{k}$. Then find the value of a.(b × c)

1. 40

2. 0

3. 60

4. 85

Correct Option - **3**

Que. 30 If $x^2 + y^2 = t + \frac{1}{t}$ and $x^4 + y^4 = t^2 + \frac{1}{t^2}$. then find the value of $\frac{dy}{dx}$

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

2. 0

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

4. $-\frac{1}{x^3}$

Correct Option - **1**

How many words can be made from the letters of the word BHARAT in which B and H never come together

Que. 31 360

2.   300

3.   240

4.   120

Correct Option - **3**

Que. 32 Find sin 15° .

1. $\dfrac{\sqrt{3}-1}{2\sqrt{2}}$

2. $\dfrac{\sqrt{3}-2}{\sqrt{2}}$

3. $\dfrac{\sqrt{3}}{2\sqrt{2}}$

4. $\dfrac{3-\sqrt{2}}{\sqrt{2}}$

Correct Option - **1**

Que. 33 Find the domain and range of following function

$$f(x) = (x^2 - 1)/(x - 1)$$

1.   Domain = Range

2.   D = [0, 4], R = (- ¥, - 1) È (1, 4]

3.   D = R - {1}, Range = R -{2}

4.   None of the above

Correct Option - **3**

Que. 34 Find $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} (\sin x + \tan x)\, dx$

1.   1

2. $\pi/2$

3.   0

4.   -1

Correct Option - **3**

Que. 35 What is the period of the function f(x) = 2sin x cos x?

1. 2π

2. π

3. 3π

4.   None of these

Correct Option - **2**

Que. 36 $\lim\limits_{x \to 0} \dfrac{1 - \cos 2x}{x^2}$ is

1.   2

2.   0

3. 1
4. 4

Correct Option - **1**

Que. 37 Central term in the expansion of $\left(2x - \frac{1}{3x}\right)^{10}$ is:

1. $-{}^{10}C_4 \left(\frac{2}{3}\right)^4$
2. ${}^{10}C_4 \left(\frac{2}{3}\right)^5$
3. ${}^{10}C_5 \left(\frac{2}{3}\right)^4$
4. $-{}^{10}C_5 \left(\frac{2}{3}\right)^5$

Correct Option - **4**

Que. 38 In a moderately skewed distribution, which of following equation indicates the relationship among mean, median and mode?

1. Mean = 2 Mode - 3 Median
2. Mode = 3 Median - 2 Mean
3. Median = 3 Mean - 2 Mode
4. Mode = 3 Mean - 2 Median

Correct Option - **2**

Que. 39 If the 4th, 7th and 10th terms of a G.P. be a, b, c respectively, then the relation between a, b, c is

1. $b = \frac{a+c}{2}$
2. $a^2 = bc$
3. $b^2 = ac$
4. $c^2 = ab$

Correct Option - **3**

Que. 40 Value of $\int x \log x \, dx$ is

1. $\frac{x^2 \log x}{2} - \frac{x^2}{4} + C$
2. $\frac{x \log x}{2} - \frac{x}{4} + C$
3. $x^2 \log x - \frac{1}{4x} + C$
4. $\frac{(\log x)^2}{2} - \frac{x^2}{4} + C$

Correct Option - **1**

Que. 41 $\int \frac{\cos 2x}{\cos^2 x . \sin^2 x} dx = ?$

1. -cot x - tan x + c
2. cot x - tan x + c
3. cot x + tan x + c

4.   tan x - cot x + c

Correct Option - **1**

Que. 42   Find the number of terms in $(x + y)^{20}$

1.   21
2.   22
3.   23
4.   24

Correct Option - **1**

Que. 43   What is $\dfrac{\sin \theta + 1}{\cos \theta}$ equal to?

1. $\dfrac{\sin \theta + \cos \theta - 1}{\sin \theta + \cos \theta + 1}$
2. $\dfrac{\sin \theta + \cos \theta - 1}{\sin \theta + \cos \theta - 1}$
3. $\dfrac{\sin \theta - \cos \theta - 1}{\sin \theta + \cos \theta + 1}$
4. $\dfrac{\cos \theta - \sin \theta + 1}{\sin \theta + \cos \theta - 1}$

Correct Option - **4**

Que. 44   If A is a square matrix such that $A^2 = I$, then $(A - I)^3 + (A + I)^3 - 7A$ is equal to

1.   A
2.   I − A
3.   I + A
4.   3A

Correct Option - **1**

Que. 45   For matrix $A = \begin{bmatrix} 2 & 5 \\ -11 & 7 \end{bmatrix}$, (adj A)' is equal to :

1. $\begin{bmatrix} -2 & -5 \\ 11 & -7 \end{bmatrix}$
2. $\begin{bmatrix} 7 & 5 \\ 11 & 2 \end{bmatrix}$
3. $\begin{bmatrix} 7 & 11 \\ -5 & 2 \end{bmatrix}$
4. $\begin{bmatrix} 7 & -5 \\ 11 & 2 \end{bmatrix}$

Correct Option - **3**

Que. 46

The inverse of matrix A, where A = $\begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$ is

1. $\begin{bmatrix} 3 & 5 \\ -1 & 2 \end{bmatrix}$

2. $\begin{bmatrix} 3 & -5 \\ -1 & 2 \end{bmatrix}$

3. $\begin{bmatrix} 3 & -5 \\ 1 & 2 \end{bmatrix}$

4. $\begin{bmatrix} -2 & 1 \\ 5 & 3 \end{bmatrix}$

Correct Option - **2**

Que. 47 For two vectors

$\vec{A} = 2\hat{i} + 2\hat{j} + 3\hat{k}$ and $\vec{B} = 5\hat{i} + 2\hat{j} + 7\hat{k}$, find $\vec{A}.\vec{B}$.

1. 35
2. 37
3. 27
4. 53

Correct Option - **1**

Que. 48 What is the perpendicular distance from the point (2, 3, 4) to the line $\frac{x-0}{1} = \frac{y-0}{0} = \frac{z-0}{0}$?

1. 2
2. 5
3. 7
4. 4

Correct Option - **2**

Que. 49 Find the order and degree of the differential equation $\frac{d^2y}{dx^2} + 3\left(\frac{dy}{dx}\right)^2 + 4y = 0$

1. Order = 2 and Degree = 1
2. Order = 1 and Degree = 2
3. Order = 2 and Degree = 2
4. Order = 1and Degree = 1

Correct Option - **1**

Que. 50 If a coin is tossed thrice, find the probability of getting one or two heads.

1. $\frac{4}{5}$

2. $\frac{5}{8}$

3. $\frac{3}{4}$

4. $\frac{6}{4}$

Correct Option - **3**

Que. 51	Select the correctly spelt word.

1. Mathmetics
2. Mathamatics
3. Mathametics
4. Mathematics

Correct Option - **4**

Que. 52	Select the most appropriate synonym of the given word.

AGONY

1. Pain
2. Help
3. Risk
4. Blame

Correct Option - **1**

Que. 53	Select the most appropriate ANTONYM of the given word.

LENIENT

1. Generous
2. Helpful
3. Strict
4. Defensive

Correct Option - **3**

Que. 54	Complete the following sentence by choosing the correct option:

No sooner did we go out on the road _____ it began to rain heavily.

1. when
2. than
3. then
4. but

Correct Option - **2**

Que. 55	Select the most appropriate option to complete the sentence.

He shouted _____ the top of his voice, but nobody heard him.

1. on
2. upon
3. with
4. at

Correct Option - **4**

Que. 56	Direction: Select a word or phrase from the given list to complete the sentence:

They needn't worry, _____?

1. isn't it
2. doesn't it
3. don't it
4. need they

Correct Option **- 4**

Que. 57 A sentence has been given with a blank to be filled with an appropriate word. Choose the correct alternative.

More than a decade has passed since this house was _____

1. build
2. built
3. is build
4. building

Correct Option **- 2**

Que. 58 **DIRECTIONS:** Fill in the blank with correct preposition

Distribute the sweets equally _____ four children.

1. Between
2. In
3. Among
4. Through

Correct Option **- 3**

Que. 59 **In the following question, out of the four alternatives, select the alternative which is the best substitute of the phrase.**

That which cannot be believed

1. Awesome
2. Incredible
3. Credible
4. Ineffective

Correct Option **- 2**

Que. 60 **Identify the segment in the sentence which contains a grammatical error.**
Australia is one of the most prepossessing country in the Southern Hemisphere.

1. Australia is one
2. of the most prepossessing
3. country in
4. the Southern Hemisphere.

Correct Option **- 3**

Que. 61 **Identify the segment in the sentence which contains a grammatical error.**
Neither Elena nor they is going to win the lucrative basketball tournament.

1. Neither Elena
2. nor they
3. is going to win
4. the lucrative basketball tournament

Correct Option - **3**

Que. 62	**Select the correct passive form of the given sentence.**

He wrote a letter in verse form to his friend.

1. A verse in letter form had been written by him to his friend.
2. A letter in verse form was being written by him to his friend.
3. A letter in verse form was written by him to his friend.
4. A letter in verse form has been written by him to his friend.

Correct Option - **3**

Que. 63	**Select the most appropriate indirect form of the given sentence.**

He said, "Hurray! I have won the match."

1. He exclaimed with great sorrow that he had won the match.
2. He exclaimed with great joy that he had won the match.
3. He exclaimed with great joy that he would won the match.
4. He exclaimed with great joy that he have won the match.

Correct Option - **2**

Que. 64	**Given here are four jumbled sentences. Pick the option that gives the correct order.**

A. So I had to try this place out.
B. serves up the best Dutch apple pie in all of Utrecht.
C. This is a magnificent restaurant right here which
D. And I love Dutch apple pie.

1. ABDC
2. CBDA
3. ABCD
4. DCBA

Correct Option - **2**

Que. 65	**Given here are four sentences. The first sentence is in the correct order, while the rest of the sentences are jumbled. Pick the option that gives the correct order.**

A. This is the Residenz and actually, I have just learned
B. which is very impressive given the fact the first structure
C. was built in 1395 and it continued being bigger and bigger and bigger.
D. that this is the largest city palace in all of Germany.

1. ABCD
2. ADBC
3. ACDB
4. ADCB

Correct Option - **2**

Que. 66 | **Directions: Read the following passage and answer the given questions:**

Women's empowerment refers to the ability of women to have control over their own lives and make their own choices. This includes having equal access to education, employment opportunities, and the ability to participate in political and economic decision-making. To truly empower women, we must work to eliminate these attitudes and break down the systemic barriers that hold women back. This requires a multifaceted approach, including policies and programmes that promote gender equality and education and awareness campaigns that challenge stereotypes and biases. However, despite the progress that has been made in recent years, there remain <u>indifferent </u>attitudes towards women's empowerment. These individuals may not actively work to hold women back, but they also do not actively work to promote equality and empowerment. It is important to actively work to change these attitudes and promote a culture of equality and empowerment for all women.

What does "women's empowerment" refer to?
1. Women's rights are not treated with the same respect and importance as men's rights.
2. Women are denied basic rights, such as access to education.
3. The ability of women to have control over their own lives.
4. Many women are vulnerable to exploitation and abuse.

Correct Option - **3**

Que. 67 | Select the most appropriate ANTONYM of the given word.
"Indifferent"

1. Apathetic
2. Attentive
3. Insensible
4. Incurious

Correct Option - **2**

Que. 68 | What is the importance of changing indifferent attitudes toward women's empowerment?
1. Women are not valuable members of society and are not worthy of the same rights and opportunities as men.
2. A culture of discrimination, where women are treated as second-class citizens.
3. Women are subject to physical, sexual, and emotional abuse.
4. It promotes a culture of equality and empowerment for all women.

Correct Option - **4**

Que. 69 | What is required to truly empower women?
1. An attitude shift and a shift in mindset towards gender equality.
2. To eliminate typical attitudes and break down the systemic barriers that hold women back.
3. Women have the same rights, abilities, and opportunities as men.
4. Tackling the underlying causes of gender inequality in our societies.

Correct Option - **2**

Que. 70 Select the verb form of **an adjective "pacific"** from the given options:

1. pacify
2. pacifying
3. pacified
4. pacification

Correct Option - **1**