### Question No.1

Two nuclei having same number of nucleons but the number of protons in one of them is equal to the number of ______ in the other are called mirror nuclei.

- (A) neutrons (Chosen option)
- (B) protons
- (C) neutrons
- (D) electrons

### Question No.2

The necessary entering behaviour is the availability to the organism of particular responses, this is ________.

- (A) Classical conditioning
- (B) Problem-solving ability
- (C) Instrumental learning (Chosen option)
- (D) Teaching skill

### Question No.3

Perturbation method can be applied to:

- (A) Systems with large perturbation
- (B) When the perturbation is small and the ground state properties are known (Chosen option)
- (C) When the perturbation is small and the ground state properties are not known
- (D) All problems (systems)

### Question No.4

________ philosophy of education considers education as a spiritual need.

- (A) Realism
- (B) Pragmatism
- (C) Naturalism (Chosen option)

Idealism focuses on a spiritual outlook and emphasizes on the existence of God. Naturalism focuses on a materialistic outlook and does not believe in the existence of God. According to this concept, universe is created by the readymade nature. Nature is the sole real entity.
### Question No.5
Spin - Spin interaction is:

- Dependent on the strength of the applied magnetic field and coupling constants. (A)
- Dependent on the strength of the applied magnetic field, independent of the coupling constants. (B)
- Independent of the strength of the applied magnetic field, dependent on the coupling constants. (C)
- Independent of the strength of the applied magnetic field and coupling constants. (D) (Chosen option)

### Question No.6
The variation method yields:

- Exact value of ground state energy. (A)
- Value of excited state energy. (B)
- Wave function for ground state (Chosen option). (C)
- Upper limit to the ground state energy. (D)

### Question No.7
The material, which is used for making Solar cells:

- Silicon (Chosen option). (A)
- Iron. (B)
- Aluminium (Chosen option). (C)
- Copper. (D)

### Question No.8
According to Franck - Condon Principle:

- Vibrating molecule does not change its inter-nuclear distance (Chosen option). (A)
- Vibrating molecule changes its inter-nuclear distance. (B)
- Rotating molecule does not change its inter-nuclear distance. (C)
- Rotating molecule changes its inter-nuclear distance. (D)

### Question No.9
In spherical harmonics, if \( Y_{lm}(\theta, \phi) \) are the eigen functions of \( L^2 \), then the eigen values are:

(A) \( (l+1)^2 \)

(B) \( l(l+1) \)

(C) \( l(l+1)-2 \) (Chosen option)

(D) \( 2l(l+1) \)

<table>
<thead>
<tr>
<th>Question No.10</th>
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<tbody>
<tr>
<td><strong>According to the principle of virtual work, a system of particles is in equilibrium only if the virtual work of the applied forces is</strong></td>
<td>** Bookmark **</td>
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<tr>
<td>Treatment to the system will change, if the virtual work of the applied forces is <strong>frictional</strong> or <strong>infinite</strong>, then the virtual work of the applied forces will be <strong>zero</strong>.</td>
<td>** Bookmark **</td>
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<tr>
<td>(A) frictional</td>
<td>(B) infinite</td>
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<tr>
<td>(C) zero (Chosen option)</td>
<td>(D) constant</td>
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<th>Question No.11</th>
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<tr>
<td><strong>The Teaching and Learning International Survey (TALIS) asks teachers and school leaders about working conditions and learning environments at their schools to help countries face diverse challenges.</strong></td>
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<td>(A) ISES - NCERT (Chosen option)</td>
<td>(B) TALIS</td>
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<td>(C) STEPP</td>
<td>(D) UNESCO - UIS</td>
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<th>Question No.12</th>
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<td><strong>The energy density of a radiation (photons) is given by:</strong></td>
<td>** Bookmark **</td>
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<tr>
<td>( u(\nu) = \frac{8\pi h\nu^3}{c^3} \left( e^{\nu/kT} - 1 \right) ) (Chosen option)</td>
<td>** Bookmark **</td>
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<tr>
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<td>** Bookmark **</td>
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<tr>
<td>(C)</td>
<td>** Bookmark **</td>
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</table>
\[ u(n) = \frac{8\pi \hbar^3 \nu}{\nu^3 (e^{\hbar \nu / KT} - 1)} \]

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Question No.13

Permanent dipole moment consists of the following angular momentum:

(A) nuclear spin angular momentum
(B) electron spin angular momentum
(C) All of these (Chosen option)
(D) orbital angular momentum of electron

Question No.14

Which one of the following is correct?

(A) IUPAC - International Union of Pure and Analytical Chemistry
(B) ISBN - Indian Standard Book Number
(C) UNESCO - United Nations Educational Scientific and Cultural Organisation (Chosen option)
(D) LAN - Local Arial Network

Question No.15

An energy eigen value 'E' is said to be degenerate when:

(A) many energy functions have many energy values
(B) one energy function has one energy value
(C) one energy function has many energy value
(D) many energy functions for one energy value (Chosen option)

Question No.16

The energy gap in the Dirac free electron energy spectrum is:

(A) \(-\frac{\hbar^2}{2m^2}\)
(B) zero (Chosen option)
(C) \(\frac{\hbar^2}{2m^2}\)
Question No.17
Which instruction is not used for clearing the accumulator?

(A) SUB A (Chosen option)
(B) MVI A, 00H
(C) ANI 00H
(D) MOV A, 00H

Question No.18
The uncertainty in the energy of a system that has a finite lifetime $\tau$ is given by:

(A) $\frac{\Delta E}{\tau} \geq \frac{\hbar}{2\tau}$ (Chosen option)
(B) $\frac{2\tau}{\hbar}$
(C) $\frac{2}{\hbar}$
(D) $\frac{\hbar}{2}$

Question No.19
If $\uparrow$ is the raising operator and $\downarrow$ is the lowering operator then, the value of $L + L^-$ is:

(A) $\leftarrow L_+$
(B) $L^2 - L_z^2 \leftarrow L_z$
(C) $L^2 - L_z^2 + \uparrow L_z$
(D) $2 \leftarrow L_z$ (Chosen option)
Question No.20

In case same lines are obtained in both infra-red and Raman spectra, then the molecule should have:

(A) high value of displacement

(B) low value of displacement

(C) centro symmetric

(D) no centre of symmetry (Chosen option)

Question No.21

In a.c. Josephson's effect, the supercurrent is given by the relation:

(A) \[ J = J_0 \sin \left( \frac{\hbar}{2eV} t \right) \]

(B) \[ J = J_0 \sin \left( \frac{\hbar}{2eV} t \right) \]

(C) \[ J = J_0 \sin \left( \frac{2eVt}{\hbar} \right) \]

(D) \[ J = J_0 \sin \left( \frac{2eVt}{\hbar} \right) \]

(D) \[ J = J_0 \sin \left( \frac{\delta(0) + 2eVt}{\hbar} \right) \]

Question No.22

'Unity of substance, origin and purpose' is a threefold idea of unity put forth by __________.

(A) Swami Vivekananda (Chosen option)

(B) Froebel

(C) Swami Dayand Saraswathi

(D) J.J. Rousseau

J.J. வெவ்வேகாண்டா

Question No.23

A superconducting material when placed in a magnetic field will:

(A) repel all the magnetic lines of forces passing through it (Chosen option)

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(B) ○ attract the magnetic field towards its centre
(C) ○ not influence the magnetic field
(D) ○ attract the magnetic field but transfer it into a concentrated zone

**Question No.24**

A circular coil having 50 turns has a radius of 0.1 m. What is the magnetic induction at the centre of coil when a current of 0.1 A flows in it?

(A) 25 Tesla
(B) 6.28 x 10^{-5} Tesla
(C) 3.14 x 10^{-5} Tesla (Chosen option)
(D) 2.81 x 10^{-4} Tesla

**Question No.25**

_________ theory advocates that understanding the map making rather than holding up Stimulus - Response (S-R) connections.

(A) Hulls systematic behaviour
(B) Guthires congruity
(C) Lewins field (Chosen option)
(D) Tolman sign

**Question No.26**

What is the value of the Lande g factor for an energy state with \( L = 1 \) and \( J = \frac{3}{2} \)?

\( \text{Lande g factor} = 4 \) (Chosen option)
Question No.28

The geometrical depolarizing factor ‘N’ for a sphere about any axis is:

\[
A = \begin{bmatrix}
1 & 0 & 0 \\
0 & 1 & 1 \\
0 & 1 & 1
\end{bmatrix}
\]

at eigen value of unity is:

\[
\begin{cases}
1, 1, 1 \\
0, 1, 0 \\
1, 0, 0 \\
0, 0, 0
\end{cases}
\]

(A) \(\{1, 1, 1\}\)
(B) \(\{0, 1, 0\}\)
(C) \(\{1, 0, 0\}\) (Chosen option)
(D) \(\{0, 0, 0\}\)

Question No.29

1 Bohr magneton is:

\[
\begin{cases}
9.27 \times 10^{-24} \text{ amp m}^2 \\
9.27 \times 10^{-9} \text{ amp m}^2 \\
2.27 \times 10^{-24} \text{ amp m}^2 \\
6.67 \times 10^{-34} \text{ amp m}^2
\end{cases}
\]

(A) \(9.27 \times 10^{-24} \text{ amp m}^2\) (Chosen option)
(B) \(9.27 \times 10^{-9} \text{ amp m}^2\)
(C) \(2.27 \times 10^{-24} \text{ amp m}^2\)
(D) \(6.67 \times 10^{-34} \text{ amp m}^2\)

Question No.30

The number \((100101)_2\) is equivalent to octal _________.

\((100101)_2\) \(\text{Chosen option}\) \(45\)

(A) \(45\) (Chosen option)
(B) \(26\)
Question No.31

A clock in the moving rocket will appear to run slower than the clock on the surface of the earth. In accordance with this \( t = \) \( \frac{t_0}{\sqrt{1 - \frac{v^2}{c^2}}} \) (Given \( t_r \) - time interval of clock at rest, \( t \) - time interval of clock in motion with velocity \( v \)).

(A) \( \frac{t_0}{\sqrt{1 - \frac{v^2}{c^2}}} \) (Chosen option)

(B) \( \frac{t_0}{\sqrt{1 + \frac{v^2}{c^2}}} \)

(C) \( \frac{t_0}{\sqrt{1 + \frac{v^2}{c^2}}} \)

(D) \( \frac{1}{t_0} \sqrt{1 - \frac{v^2}{c^2}} \)

Question No.32

The intensity ratio of Stokes to Anti-Stokes is:

(A) \( \frac{(v_0 + v_m)^2}{(v_0 - v_m)^2} \exp \frac{h v_m}{K T} \)

(B) \( \frac{(v_0 - v_m)^4}{(v_0 + v_m)^4} \exp \frac{h v_m}{K T} \) (Chosen option)
Question No.33

According to Pauli’s theory of paramagnetism, the magnetic susceptibility of free electrons is \( \chi_m = \frac{(v_0 - v_m)^4}{(v_0 + v_m)^4} \exp \frac{h v_m}{k T} \).

\[
\begin{align*}
\text{(A)} & \quad \frac{3 nE_F}{2 \mu_B^2} \\
\text{(B)} & \quad \frac{3 nE_F}{2 \mu_B^2} \\
\text{(C)} & \quad \frac{nE_F}{2 \mu_B^2} \\
\text{(D)} & \quad \frac{nE_F}{2 \mu_B^2}
\end{align*}
\]

Question No.34

The life of an electronic device has a mean of 300 hours and a standard deviation of 25 hours. Assuming normal distribution of life times, find the probability that any one of these devices will have a life time of more than 350 hours.

\[
\begin{align*}
\text{(A)} & \quad 0.4772 \\
\text{(B)} & \quad 0.4772 \\
\text{(C)} & \quad 0.0228 \quad \text{(Chosen option)}
\end{align*}
\]
Question No.35
What is the nature of $I$ in the products of inertia associated with corresponding co-ordinate planes, if

$$I_{x} = I_{z} = - \sum_{i} m_{i} z_{i} x_{i}$$

$$(D) \text{ symmetric scalar}$$

B:

$$I_{x} = I_{z} = - \sum_{i} m_{i} z_{i} x_{i}$$

$$(A) \text{ symmetric tensor (Chosen option)}$$

C:

Asymmetric scalar

D:

Asymmetric tensor

Question No.36
Which metal have highest melting point?

$$(C) \text{Tungsten (Chosen option)}$$

A:

Copper

B:

Silver

D:

Nickel

Question No.37
"Freedom to learn" is the classic work of_________ in which conditions for the promotion of learning: empathy, positive regard and genuineness is explained.

$$(C) \text{ Carl Rogers}$$

A:

E.L. Thorndike

B:

Alfred Binet

D:

Ned Flanders (Chosen option)

Question No.38
Every finite group is isomorphic with a subgroup of_________ group.

$$(A) \text{ symmetric}$$

B:

Asymmetric

C:

Acyclic

D:

Acyclic
Question No.39

The relativistic formula for kinetic energy is:

1. \( T = mc \)
2. \( T = m \tfrac{v^2}{c^2} \)
3. \( T = m \tfrac{v}{c} \)
4. \( T = m \tfrac{c^2}{v} \)

(A) \( T = (m-m_0)c^2 \) (Chosen option)

(B) \( T = \frac{1}{2} mc^2 \)

(C) \( T = mc^2 \)

(D) \( T = m_0c^2 \)

Question No.40

For paramagnetic materials, the relative magnetic permeability \( \mu_r \) at room temperature is nearly:

1. Zero
2. 10 (Chosen option)
3. 1
4. 100

(A) Zero

(B) 10 (Chosen option)

(C) 1

(D) 100

Question No.41

The Third All India Educational Survey was undertaken in the year:

1. 1973
2. 1978
3. 1965 (Chosen option)
4. 1984

(A) 1973

(B) 1978

(C) 1965 (Chosen option)

(D) 1984

Question No.42

Feedback refers to information available to students that makes possible the comparison of actual performance with some standard of performance.

(A) Criticism

(B) Communication (Chosen option)

(C) Feedback

(D) Reinforcement

Question No.43
Consciousness Development System (CDS)
Reticular Activating System (RAS)

1.00

Deoxyribo Nucleic Acid (DNA)
Withdrawal
Avoidance
Sublimation

Zone of Proximal Development (ZPD)

Find the unit vector perpendicular to the surface \(x^2+y^2-z^2=11\) at the point (4, 2, 3).

(A) \(\frac{4\hat{i} + 2\hat{j} - 3\hat{k}}{\sqrt{29}}\)
(B) \(\frac{4\hat{i} + 2\hat{j} - 3\hat{k}}{\sqrt{29}}\)
(C) \(\frac{8\hat{i} + 4\hat{j} - 6\hat{k}}{\sqrt{29}}\) (Chosen option)
(D) \(\frac{\hat{i} + 4\hat{j} - 6\hat{k}}{\sqrt{29}}\)
Question No.47

For the circuit of a given figure with an ideal operational amplifier, the maximum phase shift of the output $V_{out}$ with reference to the input $V_{in}$ is:

(A) $90^\circ$

(B) $0^\circ$ (Chosen option)

(C) $-90^\circ$

(D) $\pm 180^\circ$

Question No.48

What is the mass ‘m’ of a particle, if its rest mass ‘$m_0$’ moves with a speed $\frac{c}{\sqrt{2}}$?

(A) $0.5 \, m_0$

(B) $1.414 \, m_0$ (Chosen option)

(C) $m_0$
Question No.49
When a student learn to link 'cat' with 'dog' more easily than 'cat' with 'inch' or 'cat' with 'buckle', then it is an example of

(A) Physical learning
(B) Synchronous learning
(C) Paired-associate learning (Chosen option)
(D) Motivated learning

Question No.50
What is the normal frequency of vibration of a linear triatomic molecule executing asymmetric stretching?

(A) \( \omega = \frac{k}{m} \left(1 - \frac{2m}{M} \right) \)
(B) \( \omega = \frac{k}{m} \left(1 + \frac{2m}{M} \right) \)
(C) \( \omega = 0 \)
(D) \( \omega = \frac{k}{m} \left(1 + \frac{2m}{M} \right) \) (Chosen option)

Question No.51
The learner is destined to imbibe typical characteristics of his/her individual character. This stage of affective domain is

(A) Organization
(B) Valuing
(C) Characterization by a value (Chosen option)
(D) Receiving

Question No.52
The total power radiated by an oscillating electric dipole is proportional to \( \omega^3 \) of the exciting wavelength. What is the normal frequency of vibration of a linear triatomic molecule executing asymmetric stretching?
Question No.53

_____ principle states that "what was being done in the past in the presence of a set of stimuli will tend to be done next when the stimulus combination occurs".

(A) Extinction
(B) Dark 'Ghetto' (Chosen option)
(C) Association
(D) Recency

Question No.54

Which of these is not a characteristic of Poisson distribution? (Given: p or q are success or failure, n is number of events, m is Poisson distribution parameter)

(A) n is small and p is large
(B) p is close to zero, the distribution is J shaped
(C) entire distribution can be obtained from single parameter 'm' (Chosen option)
(D) n is large and p is small

Question No.55

The rotation of a symmetric top about intermediate axis or line of nodes is called:

(A) precession
(B) curling
(C) spin
(D) nutation (Chosen option)

Question No.56

Magnetic materials having relative permeability <1 are called ________ materials.

(A) Diamagnetic (Chosen option)
(B) Ferromagnetic
(C) Ferrimagnetic
(D) Paramagnetic
Question No.57

At Neel temperature:

(A) ☐ susceptibility is minimum

(B) ☐ susceptibility is maximum (Chosen option)

(C) ☐ permeability is minimum

(D) ☐ permeability is maximum

Question No.58

In NMR spectrum of CH₃CHO the number of lines obtained:

CH₃CHO—க் NMR சிற்றேலிக்கியில் எத்தனைகள் எழுந்துள்ளன்?

(A) ☐ 1

(B) ☐ 3

(C) ☐ 2

(D) ☐ 4 (Chosen option)

Question No.59

The Hermite polynomial of degree n, for n being a positive integer is:

'Hₙ' என்ற கீர்மை எதுவும் செய்தியாக உள்ளது, 'n' ஐயலினால் எதிர்க்காண்பது எவனையாளைச் செய்யவுண்டு?

(A) ☐

(B) ☐ (Chosen option)

(C) ☐

(D) ☐

Question No.60

Under the Constitution of India, which one of the following is not a Fundamental Duty?

‘இந்திய நாட்டின் வடிவமைப்புவடிவங்களில் அதிசயம் எழுந்துள்ளோர் அதிசயம் கையேற்றமாக உள்ளன்று?'

(A) ☐ To vote in Public Elections (Chosen option)

(B) ☐ To develop the scientific temper

(Chosen option)
Question No.61

Evaluate \( \int_{0}^{1} \frac{dx}{\sqrt{-\log x}} \) using Gamma function.

(A) \( \frac{1}{\sqrt{\pi}} \)

(B) \( \frac{\sqrt{\pi}}{2} \) (Chosen option)

(C) \( \frac{1}{2} \)

(D) \( \frac{1}{\pi} \)

Question No.62

A problem in Physics is given to three students A, B and C, whose chances of solving it are \( \frac{1}{2} \), \( \frac{1}{3} \) and \( \frac{1}{4} \) respectively. What is the probability that the problem is solved?

(A) \( \frac{1}{4} \)

(B) \( \frac{2}{3} \)

(C) \( \frac{3}{4} \) (Chosen option)

(D) \( \frac{9}{16} \)

Question No.63

If the differential voltage gain and the common mode voltage gain of a differential amplifier are 48 dB and 2 dB respectively then its
We know that CMRR =
\[ 20 \log (\text{CMRR}) = 20 \log Ad - 20 \log Ac = 48 - 2 = 46 \text{ dB}. \]

**Question No.64**

The expectation value of momentum a particle constrained to move along x-axis in a domain \(0 \leq x \leq L\) with a wave function \(\psi(x) = \sin \left( \frac{n\pi x}{L} \right)\) is:

\[
\langle p \rangle = \frac{n\pi}{L} \int_0^L \sin \left( \frac{n\pi x}{L} \right) \psi(x) \psi^*(x) \, dx
\]

(A) \(0\) 48 dB
(B) 50 dB
(C) 24 dB (Chosen option)
(D) 25 dB

**Question No.65**

In the Operant Conditioning theory __________ means that other stimuli similar to the one used in training may take on the power to produce the response.

(A) Orientation
(B) Stimulus Generalization
(C) Extinction (Chosen option)
(D) Discrimination

**Question No.66**

In the Operant Conditioning theory __________ means that other stimuli similar to the one used in training may take on the power to produce the response.

(A) Orientation
(B) Stimulus Generalization
(C) Extinction (Chosen option)
(D) Discrimination

EXTINCTION - If the CS is presented repeatedly in the absence of the UCS, the CS-CR bond will weaken and the CR will eventually disappear.

STIMULUS GENERALIZATION - Once conditioning has occurred the subject may respond not only to the CS, but to stimuli similar to it. For example, many of our likes and dislikes of new people and situations come from generalization based on similarities to past experiences.

STIMULUS DISCRIMINATION – opposite of stimulus generalization. SD is the ability to detect differences among stimuli. This procedure is sometimes used to test the ability of nonverbal subjects to discriminate among various stimuli, such as color (air puff / eye blink).
The rank of the given matrix \( A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ -3 & -6 & -9 \end{bmatrix} \) is:

(A) 1 (Chosen option)
(B) 2
(C) 3
(D) 0

Question No.67

According to Gamow's theory of alpha decay, the relation between disintegration constant \( \lambda \), frequency of a particle collision with the walls \( \nu \) and the probability of transmission \( P \) in each collision is:

\[ \lambda = \frac{uP}{\nuP} \quad \text{(Chosen option)} \]

\[ \lambda = \frac{Ap}{\nuP} \]

\[ Ap^2 = \text{constant} \]

\[ P = \frac{\nu\lambda}{P} \]

Question No.68

For what combination of atomic number 'Z' and mass number 'A' is the pairing energy '\( \delta \)' considered negative in the semi empirical mass formula?

(A) odd Z, even N

(B) even Z, odd N

(C) odd Z, odd N (Chosen option)

(D) even Z, even N

Question No.69

Strength of which magnet can be changed?

(A) Ring magnet (Chosen option)

(B) Bar magnet

(C) Electromagnet

(D) Horse shoe magnet
Question No. 70

If \( q \) represents the number of states and \( n \) represents the number of particles in the \((E, E+dE)\) domain, Maxwell Boltzmann, Bose-Einstein and Fermi Dirac statistics produce the same result when \( \frac{q}{n} \) is:

\[(E, E+dE) \text{ domain:}\]

(A) \( -1 \)
(B) \( 0 \) (Chosen option)
(C) \( >> 1 \)
(D) \( << 1 \)

Question No. 71

Find the output \( Y_1, Y_2 \) when \( A = 0, B = 1 \):

\( A \)
\( B \)
\( \rightarrow \)
\( Y_1 \)
\( \rightarrow \)
\( Y_2 \)

\( A = 0, B = 1 \) ஆற்றால் \( Y_1, Y_2 \) விளைவாகத் தேர்வு செய்யலாம்:

(A) \( 11 \) (Chosen option)
(B) \( 01 \)
(C) \( 00 \)
(D) \( 10 \)

Question No. 72

The relation between thermodynamical entropy 'S' and statistical entropy 'σ' is: \((K - \text{Boltzmann's constant})\)
1. Eskimos
2. Under ground
3. Outstanding
4. Strip

Question No.74

Hunters of Canada are called :

(A) Pygmies (Chosen option)
(B) Masai
(C) Lapps
(D) Eskimos

Question No.75

__________ may be defined as thinking reflectively and productively and evaluating the evidence; it enables to grasp deeper meaning of ideas, keep an open mind about different approaches and perspectives.

(A) Lateral thinking
(B) Critical thinking
(C) Divergent thinking
(D) Abstract thinking (Chosen option)

Question No.76

The divergence of magnetic vector potential 'A' is given by \( \nabla \cdot A = \) ____________

(A) \( \sigma \)
(B) \( K \)
(C) \( \frac{\sigma}{K} \)
(D) \( \frac{1}{\sqrt{K}} \)

\( \nabla \cdot A = \sigma \) is the correct answer.
Question No.77

The wave function of hydrogen like atoms is proportional to \[ a_0 \text{ is a positive constant} \]:

- \( \frac{1}{a_0} \) \( \frac{\partial \phi}{\partial t} \)
- \( \frac{1}{a_0} \) \( \frac{\partial \phi}{\partial t} \)
- \( \frac{1}{a_0} \) \( \frac{\partial \phi}{\partial t} \)
- \( \frac{1}{a_0} \) \( \frac{\partial \phi}{\partial t} \)

(C) \( \frac{1}{a_0} \) \( \frac{\partial \phi}{\partial t} \)

Question No.78

Coulomb's law states that the force of attraction or repulsion between two electric point charges is directly proportional to:

- \( \frac{1}{r^2} \) \( \frac{\partial \phi}{\partial t} \)
- \( \frac{1}{r^2} \) \( \frac{\partial \phi}{\partial t} \)
- \( \frac{1}{r^2} \) \( \frac{\partial \phi}{\partial t} \)
- \( \frac{1}{r^2} \) \( \frac{\partial \phi}{\partial t} \)

(B) \( \frac{1}{r^2} \) \( \frac{\partial \phi}{\partial t} \) (Chosen option)
Question No. 79

For copper, the resultant spin in Bohr magneton is:

(A) \( \frac{1}{2} \) (Chosen option)

(B) \( \frac{1}{2} \)

(C) \( \frac{1}{2} \)

(D) \( \frac{2}{2} \)

Question No. 80

Two vectors \( \vec{x} \) and \( \vec{y} \) are said to be orthogonal if:

\[ \vec{x} \cdot \vec{y} = 0 \]

(A) \( 0 \) (Chosen option)

(B) \( \vec{x} \)

(C) \( \vec{y} \)

(D) \( \vec{x} \) (Chosen option)

Question No. 81

Dulong - Petit's law is valid at room temperature for many metals while it fails for light elements such as boron, beryllium because:

(A) the Debye temperature of them is about 300 K

(B) the Debye temperature of them is low
Question No.82

Ohm's law relates the electric field $\vec{E}$, conductivity $\sigma$ and current density $\vec{J}$ as:

(A) $\vec{J} = \sigma / E$
(B) $\vec{J} = \sigma \vec{E}$
(C) $\vec{J} = \sigma E$
(D) $\vec{J} = E / \sigma$  

(C)  \( \sigma \) is the Debye temperature of these elements is very high (Chosen option)

(D)  none of these

Question No.83

_____ is a rational problem solving method of analyzing the educational process and making it more effective.

(A) Instructional designing (Chosen option)
(B) Gagne's hierarchy of learning
(C) Systems approach
(D) Brainstorming

Instructional designing

Question No.84

If the symbols carry their usual meanings, the maximum value of Maxwell's probability distribution function is:

(A) \( \left( \frac{2mK}{n} \right)^{\frac{3}{2}} \)
(B) \( \left( \frac{2mK}{n} \right)^{\frac{3}{2}} \)
(C) \( \left( \frac{m}{2-nKT} \right)^{\frac{3}{2}} \) (Chosen option)
Question No.85
The range of the first Brillouin zone of a linear lattice are:
(A) \( 0 \leq K \leq \pi a \)
(B) \( -\pi a \leq K \leq 0 \)
(C) \( -\frac{\pi}{a} \leq K \leq \frac{\pi}{a} \) (Chosen option)
(D) \( -\pi a \leq K \leq \pi a \)

Question No.86
At a surface at which there is an infinite potential step, the wave function becomes:
(A) zero
(B) complex
(C) infinity
(D) real (Chosen option)

Question No.87
If \( \rho \) is the space charge per unit volume, then the variation of potential along \( x \),
\[ \frac{d^2 \phi}{dx^2} = -4\pi \rho \]
gives \text{?} equation.

(A) Poisson (Chosen option)
(B) Coulomb
(C) Laplace
(D) Gauss divergence

Question No.88
Corresponding to every matrix \( A \) of rank 'r', there exist non singular matrices \( P \) and \( Q \) such that \( PAQ = \)?
Question No.89

Centre for Policy Research (CPR) is one of India’s leading think tanks focussing on public policy was established in ________.

(A) 1973 (Chosen option)
(B) 2015
(C) 2019
(D) 1956

Question No.90

The linguist ___________ opined that language has strong biological basis, with children biologically prepared to learn language at a certain time and in a certain way.

(A) Maria Montessori
(B) Noam Chomsky (Chosen option)
(C) Jean Piaget
(D) Lev Vygotsky

Question No.91

According to Lorentz transformation, when an observer S' moves with constant velocity 'v' along positive x axis, his position co-ordinate is \(x' = \frac{x - vt}{\sqrt{1-v^2/c^2}}\). According to Lorentz transformation, \(x' = \frac{x - vt}{\sqrt{1-v^2/c^2}}\). According to Lorentz transformation, \(x' = \frac{x - vt}{\sqrt{1-v^2/c^2}}\) when \(x = ________\).
Question No. 92

The normal curve of binomial distribution in terms of standard deviation 'σ' is written as:

\[ y = \frac{1}{\sqrt{2\pi \sigma^2}} e^{-\frac{x^2}{2\sigma^2}} \]

(A) \( y = e^{-\frac{x^2}{2\sigma^2}} \) (Chosen option)
(B) \( y = e^{\frac{x^2}{2\sigma^2}} \)
(C) \( y = e^{\frac{x^2}{\sigma^2}} \)
(D) \( y = \frac{e^{x^2}}{2\sigma^2} \)

Question No. 93

At the boundaries of the Brillouin zone, the solution of the wave equation \( u_x = e^{i\omega_0 x} \) represents:

(A) standing wave
(B) none
(C) running wave
(D) travelling wave (Chosen option)

Question No. 94
In a Canonical ensemble, system shall allow:

(A) Exchange particles only
   கவரங்களுடன் பரிமாற்றத்தைக் கொண்டு மட்டும்

(B) Exchange energy only but not particles (Chosen option)
   கவரங்களுடன் பரிமாற்ற கொலை அல்லது பரிமாற்றத்தைக் கொண்டு

(C) Exchange both energy and particles
   கவரங்களுடன் பரிமாற்ற கொலை மற்றும் பரிமாற்றத்தைக் கொண்டு

(D) Exchange either energy or particles only
   கவரங்களுடன் பரிமாற்ற கொலை மற்றும் பரிமாற்றத்தைக் கொண்டு

Question No.95

The packing fraction of transition elements with mass numbers around 45 is ________

(A) zero
(B) positive (Chosen option)
(C) infinity
(D) negative

Question No.96

Raman effect is:

(A) Inelastic scattering of light (Chosen option)
(B) Elastic scattering of light
(C) Absorption of light
(D) Emission of light

Question No.97

If $E_1$ is the energy of the lowest state of a one-dimensional potential box of length 'a' and $E_2$ is the energy of the lowest state when the length of the box is halved, then what is the relation between $E_1$ and $E_2$?

(a) 'a' இவர்லங்க ஐங்காய பற்றி அளவு பற்றி விளக்கத்தைத் தொடர்வே அளவு மட்டும் அளவு என்று
(b) 'a' இவர்லங்கல் ஐங்காய பற்றி விளக்கதைத் தொடர்வே குர்கள் குர்கள் அளவு என்று
(c) 'a' இவர்லங்கல் ஐங்காய பற்றி விளக்கதைத் தொடர்வே குர்கள் குர்கள் மட்டும் அளவு என்று
(d) 'a' இவர்லங்கல் ஐங்காய பற்றி விளக்கதைத் தொடர்வே குர்கள் குர்கள் மட்டும் அளவு என்று

(A) $E_2 = E_1$
(B) $E_2 = 3E_1$
(C) $E_2 = 2E_1$
(D) $E_2 = 4E_1$ (Chosen option)

Question No.98

'Regaining Excellence in Education' and 'What's Best for Children' are the works of __________, who concentrated on alternatives in public school system.

(A) Srij Dayanand Saraswathi (Chosen option)
(B) K. V. Kalai
(C) M. V. Kalai
(D) K. V. Kalai

\[ \text{Bookmarked: 8807432425} \]
Question No. 99

The Rodrigue's representation of Lagurre's polynomial $L_n(x)$ is:

(A) $e^x \frac{d^n}{dx^n} \left( e^{-x} \right)$ (Chosen option)

(B) $\frac{n!}{e^x} \frac{d^n}{dx^n} \left( e^{-x} \right)$

(C) $e^x \frac{d^n}{dx^n} \left( x^n e^{-x} \right)$

(D) $\frac{n!}{e^x} \frac{d^n}{dx^n} \left( x^n e^{-x} \right)$

Question No. 100

The units of magnetic permeability are:

(A) weber metre

(B) henry metre

(C) henry/sec.

(D) henry/metre (Chosen option)

Question No. 101

Which of these is a Hamilton's canonical equation of motion?

(A) $\dot{p}_i = \frac{\partial H}{\partial q_i}$

(B) $\dot{q}_i = \frac{\partial H}{\partial \dot{p}_i}$ (Chosen option)

(C) $\dot{q}_i = -\frac{\partial H}{\partial q_i}$

$\dot{p}_i = -\frac{\partial H}{\partial q_i}$
Question No.102

In WAIS test, under the performance scale subtests _______ is a version of the familiar code substitution test which has often been included in the non-language intelligence scales.

(A) Picture completion
(B) Picture arrangement
(C) Block design (Chosen option)
(D) Digit symbol

Question No.103

Two groups G and G’ of same order having one to one correspondence between their elements is called:

(A) Homomorphism
(B) Isomorphism (Chosen option)
(C) Automorphism
(D) Endomorphism

Question No.104

In sodium, the Fermi energy is 3.1 eV. What is its Fermi temperature?

(K_B=1.38×10^{-23} J/K)

(A) 3.6×10^4 K (Chosen option)
(B) 2.25×10^{24} K
(C) 3.6×10^3 K
(D) 2.25×10^{23} K

Question No.105

Home Rule league in Bombay was formed by:

(A) Tilak (Chosen option)
(B) Nehru
(C) Bharathiar
(D) Mrs. Annie Besant
Question No.106

In this learning the subject has less freedom in recall, the subject is expected to recall the words in the order in which they are presented?

(A) Paired-associate learning
(B) Immediate free recall
(C) Serial learning
(D) Disassociated learning

Question No.107

Project report on the 'Cost of Education' was prepared by __________.

(A) World Bank
(B) NCERT
(C) UNESCO
(D) NCTE

Question No.108

Four dice are thrown. What is the probability that the sum of the numbers appearing on the dice is 18?

(A) \( \frac{1}{36} 
(B) \( \frac{5}{18} 
(C) \( \frac{3}{4} 
(D) \( \frac{4}{18} 

Question No.109

In an 8085 microprocessor, the instruction CMP B has been executed while the content of the accumulator is less than that of register B as a result:

8085 –  தொடர்வலிபொழுதுபடிப்பில் அலகுசொல்லாகத்திற்கு அடங்க காண்க, பொதுவுடன் பின் அடங்க காண்க தில்லிக்கத்திற்கு அவ்வுடன். CMP B என்று கொள்ளலும் பிரிவுபட்டில் விளக்கம்:

(A) Carry flag will be set but zero flag will be reset
(B) Both carry flag and zero flag will be set
(C) Both carry flag and zero flag will be reset
Question No. 110
When does Lorentz transformation reduce to Galilean transformation?
(A) When V = 0
(B) When V >> C
(C) When V << C (Chosen option)
(D) When V = C

Question No. 111
If OP-amp is ideal and V_i is triangular wave then V_o will be:

(A) Parabolic wave
(B) Sine wave
(C) Triangular wave (Chosen option)
(D) Square wave

Question No. 112
The temperature of the sample is increased, the intensity of hot bands:
(A) Zero
(B) Decreases
(C) Increases (Chosen option)
(D) No change
Question No.113

The relation between rotational constant (B) and centrifugal distortion constant (D) is:

(A)  \[ D = \frac{4\pi^2}{B^2} \]
(B)  \[ D = \frac{4\pi^2}{C^2} \]
(C)  \[ D = \frac{4\pi^2}{B^2} \]
(D)  \[ D = \frac{4\pi^2}{C^2} \] (Chosen option)

Question No.114

The correct order of different types of energies is:

(A)  \[ E_r > E_{\text{vib}} > E_{\text{rot}} > E_{\text{el}} \]
(B)  \[ E_{\text{tr}} > E_{\text{vib}} > E_{\text{rot}} > E_{\text{el}} \] (Chosen option)
(C)  \[ E_{\text{tr}} > E_{\text{rot}} > E_{\text{vib}} > E_{\text{el}} \]
(D)  \[ E_{\text{el}} > E_{\text{vib}} > E_{\text{rot}} > E_{\text{tr}} \]

Question No.115

Insightful learning theory has made learning an intelligent task requiring mental abilities instead of mind fumbling and automatic responses to specific stimuli.

(A)  Operant conditioning (Chosen option)
(B)  Field theory of learning
(C)  Classical conditioning
(D)  Classical conditioning

Question No.116
Using the given circuit, Match the following:

\[ \begin{array}{c}
\text{P} & \text{HA} & \text{C} \\
\text{R} & \text{HA} & \text{S} \\
\end{array} \]

Group 1 | Group 2
---|---
(a) 0 0 0 | (i) 0 1
(b) 1 0 0 | (ii) 1 1
(c) 1 1 0 | (iii) 0 0
(d) 1 1 1 | (iv) 1 0

Question No.117
Woodworth suggests that, when an attitude is inactive it may be called as ________.

(A) disinterest
(B) disposition
(C) inattention (Chosen option)
(D) distraction

Question No.118
Which of this is the equation of continuity?

(A) \[ \dot{I} = \frac{\partial Q}{\partial t} \]
(B) \[ \dot{I} = \frac{\partial Q}{\partial t} \]
**Question No.119**

Cooper pairs are formed:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) None</td>
<td>None of these</td>
</tr>
<tr>
<td>(B) High</td>
<td>at high temperatures</td>
</tr>
<tr>
<td>(C) Very low</td>
<td>at very low temperatures (Chosen option)</td>
</tr>
<tr>
<td>(D) Very high</td>
<td>at very high temperatures</td>
</tr>
</tbody>
</table>

Cooper pair or BCS pair is a pair of electrons (or other fermions) bound together at low temperatures in a certain manner.

**Question No.120**

The coherence length of the paired electrons is:

<table>
<thead>
<tr>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) 0.25 nm</td>
<td></td>
</tr>
<tr>
<td>(B) 0.01 nm</td>
<td></td>
</tr>
<tr>
<td>(C) 0.001 nm</td>
<td>(Chosen option)</td>
</tr>
<tr>
<td>(D) 250 nm</td>
<td></td>
</tr>
</tbody>
</table>

**Question No.121**

The experiment which first detects the spin of electron is:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Stern</td>
<td>Stern and Gerlach (Chosen option)</td>
</tr>
<tr>
<td>(B) Morley</td>
<td>Michelson - Morley</td>
</tr>
<tr>
<td>(C) Davis</td>
<td>Davis and Germer</td>
</tr>
<tr>
<td>(D) G.P.</td>
<td>G.P. Thomson</td>
</tr>
</tbody>
</table>

**Question No.122**

The objectives of ______ are the development of abilities and values such as the spirit of enquiry, creativity, objectivity and aesthetic sensitivity.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Value</td>
<td>Value education (Chosen option)</td>
</tr>
<tr>
<td>(B) Work</td>
<td>Work experience</td>
</tr>
<tr>
<td>(C) Sports</td>
<td>Sports and Physical education</td>
</tr>
<tr>
<td>(D) Science</td>
<td>Science education</td>
</tr>
</tbody>
</table>

---

\[
\text{div } J + \frac{\partial \rho}{\partial t} = 0 \quad \text{(Chosen option)}
\]

\[
\text{div } J + \frac{\partial \rho}{\partial t} = 0
\]
Question No.123

The book which describes about the Tamils Society and Economic Conditions was __________.
(A) Indica
(B) Sangam Literature (Chosen option)
(C) Mountain Epigraphy
(D) Tolkappium

Question No.124

Ordinance must be ratified by the State legislature, within:
(A) 7 weeks
(B) 100 days
(C) 6 weeks (Chosen option)
(D) 150 days

Question No.125

The probability current density \( j(r, t) \) also called flux vector, is represented by:
(A) \( \text{real part of } \left( \frac{i\hbar}{m} \nabla \Psi \right) \)
(B) \( \text{real part of } \left( \frac{i\hbar}{m} \nabla \Psi \right) \)
(C) \( \Psi \)
(D) \( \frac{i\hbar}{2m} \Psi \Psi^* \) (Chosen option)

Question No.126

The proton synchrotron accelerates protons to very high energy of the order of ________ eV.
(A) million
Question No.127
1.00

Benjamin Bloom of the University of Chicago and a group of colleagues and associates developed the classification of educational objectives in the years _________.

(A) 1927
(B) 1929
(C) 1946
(D) 1956

(B) billion (Chosen option)

Question No.128
1.00

Given \( m_p = 1.007876 \text{ amu} \) and \( m_n = 1.008665 \text{ amu} \). Calculate the binding energy of an \( \alpha \)-particle if 1 amu = 931.3 MeV. [Mass of the \( \alpha \)-particle is 4.0028 amu]

\( m_p = 1.007876 \text{ amu}, m_n = 1.008665 \text{ amu} \). Given, 1 amu = 931.3 MeV. [Mass of the \( \alpha \)-particle is 4.0028 amu]

(A) 14.15 MeV
(B) 29.28 MeV
(C) 28.29 GeV
(D) 26.29 MeV (Chosen option)

Question No.129
1.00

The internal organization in D RAM is:

(A) 8 bit wide devices (Chosen option)

(B) 1 bit wide devices

(C) None of these

(D) 4 bit wide devices

Question No.130
1.00

Curie - Weiss law is:

(A) \( \Theta_m = C/\theta \)

(B) \( \Theta_m = (T - \theta)/C \)

(C) \( \Theta_m = C/(T - \theta) \) (Chosen option)

(D) \( \Theta_m = C/T \)
**Question No.131**

The expectation value of the position vector of a particle is a function only of ___________.

(A) time

(B) \( t \) and \( r \)

(C) None of these

(D) space co-ordinates (Chosen option)

**Question No.132**

If the determinant of unitary matrices of order \( n \) is +1 then the subgroup is denoted by:

\( n \) எனும் சுருக்க அணிகளின் அணியான்களின் அணியான்களின் தன்மை +1 எனும் அணியான்களின் அணியான்களின் குழுமம் என்னும் குழுமம்?

(A) \( \text{FLG}(n) \)

(B) \( \text{SU}(n) \) (Chosen option)

(C) \( D(n) \)

(D) \( C(n) \)

**Question No.133**

The inverse operation in 3d space is given by the matrix:

3d கூட்டம் செயல்களின் விரைவாக்ருதி என்னும் படிகம்?

(A) \[
\begin{pmatrix}
0 & 0 & -1 \\
0 & -1 & 0 \\
1 & 0 & 0
\end{pmatrix}
\]

(B) \[
\begin{pmatrix}
-1 & 0 & 0 \\
0 & -1 & 0 \\
0 & 0 & -1
\end{pmatrix}
\]

(C) \[
\begin{pmatrix}
0 & -1 & 0 \\
0 & -1 & 0 \\
0 & 0 & -1
\end{pmatrix}
\]

(D) \[
\begin{pmatrix}
1 & 0 & 0 \\
0 & 1 & 0 \\
0 & 0 & 1
\end{pmatrix}
\]

(Chosen option)

**Question No.134**

In which region \( c = 0 \) stretching occur in IR spectrum:

In which region \( c = 0 \) சுருக்கம் பொருந்துவது பரிசோதனை தமிழ் மற்றும் தமிழ் வலைத்தளங்கள்
The expression for the probability current density for a relativistic particle is:

\[ j^\mu = \frac{i}{2} \frac{\partial}{\partial x^\mu} \left( b^\nu \psi \right) - \frac{i}{2} \frac{\partial}{\partial t} \left( b^\nu \psi \right) - \frac{i}{2} \frac{\partial}{\partial x^\nu} \left( b^\mu \psi \right) - \frac{i}{2} \frac{\partial}{\partial t} \left( b^\mu \psi \right) \]

where \( b^\mu \) are the components of the four-velocity. 

The expression for the probability current density for a relativistic particle is:

\[ j^\mu = \frac{i}{2} \frac{\partial}{\partial x^\mu} \left( b^\nu \psi \right) - \frac{i}{2} \frac{\partial}{\partial t} \left( b^\nu \psi \right) - \frac{i}{2} \frac{\partial}{\partial x^\nu} \left( b^\mu \psi \right) - \frac{i}{2} \frac{\partial}{\partial t} \left( b^\mu \psi \right) \]

The expression for the probability current density for a relativistic particle is:

\[ j^\mu = \frac{i}{2} \frac{\partial}{\partial x^\mu} \left( b^\nu \psi \right) - \frac{i}{2} \frac{\partial}{\partial t} \left( b^\nu \psi \right) - \frac{i}{2} \frac{\partial}{\partial x^\nu} \left( b^\mu \psi \right) - \frac{i}{2} \frac{\partial}{\partial t} \left( b^\mu \psi \right) \]

(A) is always pure imaginary

(B) identical to the corresponding non-relativistic expression (Chosen option)

(C) depends on the spin of the particle

(D) invariant under Lorentz transformation

Delinquency is ________.

(A) Reflex action (Chosen option)

(B) Inherited character

(C) Learned reaction

(D) Autonomous process

Klein - Gordon equation

\[ -\hbar^2 \frac{\partial^2 \Psi(r,t)}{\partial t^2} = -\hbar^2 c^2 \frac{\partial^2 \Psi(r,t)}{\partial r^2} + m^2 c^4 \Psi(r,t) \]

\[ -\hbar^2 \frac{\partial^2 \Psi(r,t)}{\partial t^2} = -\hbar^2 c^2 \frac{\partial^2 \Psi(r,t)}{\partial r^2} + m^2 c^4 \Psi(r,t) \]

(A) is satisfied by spin 1/2 particles

(B) describes electrons

(C) describes photons (Chosen option)

(D) it is a non-relativistic wave equation

The expression for the probability current density for a relativistic particle is:

\[ j^\mu = \frac{i}{2} \frac{\partial}{\partial x^\mu} \left( b^\nu \psi \right) - \frac{i}{2} \frac{\partial}{\partial t} \left( b^\nu \psi \right) - \frac{i}{2} \frac{\partial}{\partial x^\nu} \left( b^\mu \psi \right) - \frac{i}{2} \frac{\partial}{\partial t} \left( b^\mu \psi \right) \]

1.00

Delinquency is ________.

(A) Reflex action (Chosen option)

(B) Inherited character

(C) Learned reaction

(D) Autonomous process

Klein - Gordon equation

\[ -\hbar^2 \frac{\partial^2 \Psi(r,t)}{\partial t^2} = -\hbar^2 c^2 \frac{\partial^2 \Psi(r,t)}{\partial r^2} + m^2 c^4 \Psi(r,t) \]

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Klein - Gordon equation

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\[ -\hbar^2 \frac{\partial^2 \Psi(r,t)}{\partial t^2} = -\hbar^2 c^2 \frac{\partial^2 \Psi(r,t)}{\partial r^2} + m^2 c^4 \Psi(r,t) \]

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Klein - Gordon equation

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(A) Reflex action (Chosen option)

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(C) Learned reaction

(D) Autonomous process

Klein - Gordon equation

\[ -\hbar^2 \frac{\partial^2 \Psi(r,t)}{\partial t^2} = -\hbar^2 c^2 \frac{\partial^2 \Psi(r,t)}{\partial r^2} + m^2 c^4 \Psi(r,t) \]

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(A) is satisfied by spin 1/2 particles

(B) describes electrons

(C) describes photons (Chosen option)

(D) it is a non-relativistic wave equation

1.00

Delinquency is ________.
The zero point energy of the Linear Harmonic Oscillator is given by:

\[ \frac{\hbar}{2\omega_c} \]

(A) \( \frac{\hbar}{2\omega_c} \) (Chosen option)

(B) \( \frac{2}{\omega_c} \)

(C) \( \frac{\omega_c}{\omega_c} \)

(D) \( \frac{\hbar}{2\omega_c} \)

---

**Question No.139**

The energy released in one nuclear fission of \( ^{235}\text{U} \) is

\( ^{235}\text{U} \rightarrow ^{144}\text{Ba} + ^{92}\text{Kr} + 3\alpha \)

(A) 267.4 MeV
(B) 27.5 MeV
(C) 206.7 MeV (Chosen option)
(D) 23.84 MeV

---

**Question No.140**

The orthogonality relation satisfied by associated Legendre polynomials in spherical polar co-ordinates takes the form

\[ \int_0^{\pi} P_p^m (\cos \theta) P_q^m (\cos \theta) \sin \theta \, d\theta = 0 \]

(A) \( \frac{1}{q+1} \frac{(q+m)!}{p!(q-m)!} \delta_{pq} \)

(B) \( \frac{2}{2q+1} \frac{(q+m)!}{p!(q-m)!} \delta_{pq} \) (Chosen option)

(C) \( \frac{2}{2q+1} \frac{(q+m)!}{(q-m)!} \delta_{pq} \)

---

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Question No.141

Which of the following equation explains that net magnetic induction through any closed surface is zero?

\[ \nabla \cdot B = 0 \]  (Chosen option)

(A) \( \nabla^2 B = 0 \)  
(B) \( \nabla \times B = 0 \)  
(C) \( \nabla \times B = 0 \)  
(D) \( \nabla \times B = 0 \)

Question No.142

The content of accumulator before CMA instruction is 89 H. Its content after instruction CMA கடடகளக்கீ என்றும் உள்ளது 89 H என்றும், கடடகளக்கீ என்றும் உள்ளது 89 H என்றும்.

(A) 55 H  
(B) 67 H (Chosen option)  
(C) 5 AH  
(D) 76 H  

Question No.143

In a diatomic molecule, the vibrational energy of the lowest state:

\[ \varepsilon_0 = \frac{1}{2} \nu_0 \]  (Chosen option)

(A) \[ \varepsilon_0 = \frac{1}{1} \nu_0 \]  
(B) \[ \varepsilon_0 = \frac{1}{2} \nu_0 \]  
(C) \[ \varepsilon_0 = \frac{1}{3} \nu_0 \]  
(D) \[ \varepsilon_0 = \frac{1}{4} \nu_0 \]
### Question No.144

If 'r' is coefficient of correlation and 'N' is the total number of observations. Then standard error is defined as:

\[ \text{standard error} = \frac{1 - r^2}{\sqrt{N}} \]

(A) \[ 1 - \frac{r^2}{N} \] (Chosen option)

(B) \[ 1 - \frac{r^2}{\sqrt{N}} \]

(C) \[ 1 - \frac{r^2}{\sqrt{N}} \]

(D) \[ \frac{1 - r^2}{\sqrt{N}} \]

### Question No.145

Which one of the following is not a mode of use in computer aided instruction?

- Drill and Practice
- Test agenda
- Author mode
- Problem solving (Chosen option)

### Question No.146

The book 'Talks to Teachers' was written by:

- Swami Vivekananda (Chosen option)
- William James
- James Drever
- J.B. Vatson

### Question No.147

The kinetic energy 'T' for a system of mass 'm' in generalised plane polar co-ordinates (r, θ) is:

\[ T = \frac{m}{2} \left( r^2 + r^2 \dot{\theta}^2 \right) \]

(A) \[ T = \frac{m}{2} \left( r^2 + r^2 \dot{\theta}^2 \right) \] (Chosen option)

(B) \[ T = 2m \left( r^2 + r^2 \dot{\theta}^2 \right) \]
Question No.148

Three cards are drawn at random from an ordinary pack. Find the chance that they are a king, a queen and a jack.

(A) \[
\frac{525}{5525} \quad \frac{16}{5525} \quad \frac{16}{5525}
\]

(B) \[
\frac{16}{5525} \quad \frac{525}{5525} \quad \frac{16}{5525}
\]

(C) \[
\frac{16}{5525} \quad \frac{16}{5525} \quad \frac{525}{5525}
\]

(D) \[
\frac{16}{5525} \quad \frac{16}{5525} \quad \frac{16}{5525}
\]

Question No.149

'Imaginative Stories' is a test in which _______ is given.

(A) Non-verbal task

(B) Verbal task using verbal stimuli

(C) Verbal task using non-verbal stimuli (Chosen option)

(D) Filling in gaps

Question No.150

If the mobility of electrons in a metal increases, the resistivity:

(A) decreases (Chosen option)

(B) remains constant

(C) none of these

(D) increases
Padasalai’s Telegram Groups!

(தாசஸ்யாஞ்சு சுவா கைது விளக்கம் கிளாச் பட்முரு தொடர்வும்!)

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  https://t.me/joinchat/NIfCqVRBNj9hhV4wu6_NqA

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  https://t.me/padasalaichannel

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- 11th Standard - Group
  https://t.me/Padasalai_11th

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  https://t.me/Padasalai_10th

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