TSPSC
PL

Previous Year Paper
(Physics)
04 Sept, 2023 Shift 2

TCSiON CAE

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name :	PC222005PHYSICSPL2220 04th September 2023 Shift 2
Subject Name :	PC222005 PHYSICS PL2220
Actual Answer Key :	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No
Is this Group for Examiner? :	No
Examiner permission :	Cant View

Show Progress Bar? :	No

PHYSICS

Section type :	Online
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 1 Question Id : 630680345391 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Total number of electrons in a shell is _____, where n is the principle quantum number of the shell.

Options :

1. ✔ $2n^2$

2. ✖ n^2

3. ✖ $4n^2$

4. ✖ n^3

Question Number : 2 Question Id : 630680345392 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A state of an atom is specified by listing _____ quantum numbers.

Options :

1. ✖ 1

2. ✖ 2

3. ✖ 3

4. ✔ 4

Question Number : 3 Question Id : 630680345393 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

When a light-source giving line spectrum is placed in external magnetic field, the spectral lines emitted by the atom of the source are split into a number of polarized components. This effect of magnetic field on the atomic spectral lines has been studied by _____.

Options :

1. ✔ Zeeman

2. ✖ Pauli

3. ✖ Heisenberg

4. ✖ Paschen

Question Number : 4 Question Id : 630680345394 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the effect of increasing quantum number, n on number of stark lines and on width of the pattern?

Options :

1. ✖ Stark line increases, width decreases

2. ✖ Stark line decreases, width increases

3. ✔ Both stark line and width increase

4. ✖ Both stark line and width decrease

Question Number : 5 Question Id : 630680345395 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Moseley's law states that the frequency of each corresponding k-line is approximately proportional to the _____ of the atomic number of the emitting element.

Options :

1. ✔ Square

2. ✖ Square-root

3. ✖ Cube

4. ✖ Cube-root

Question Number : 6 Question Id : 630680345396 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT a property of the light emitted by the laser?

Options :

1. ✖ Intense

2. ✖ Directional

3. ✔ Non-coherent

4. ✖ Perfectly Monochromatic

Question Number : 7 Question Id : 630680345397 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Einstein's A coefficient of spontaneous emission radiation depends on _____.

Options :

1. ✖ Intensity

2. ✖ Wavelength

3. ✖ Amplitude

4. ✔ Energy states

Question Number : 8 Question Id : 630680345398 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Helium-neon laser is a _____ laser.

Options :

1. ✖ two-level

2. ✖ three-level

3. ✔ four-level

4. ✖ five-level

Question Number : 9 Question Id : 630680345399 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct?

Options :

1. ✖ The power needed for excitation of gas laser is more than that of three-level ruby laser.

2. ✖ Gas lasers emit light which is less directional than solid-state lasers.

3. ✔ Gas lasers emit light which is more monochromatic than solid state lasers.

4. ✖ Solid-state lasers can operate continuously.

Question Number : 10 Question Id : 630680345400 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct in context of Lande interval rule?

I. Fine structure levels $^3P_0$, $^3P_1$ and $^3P_2$ have separations in the ratio of 1 : 2

II. Fine structure levels $^4D_{1/2}$, $^4D_{3/2}$, $^4D_{5/2}$, $^4D_{7/2}$ have separations in the ratio of 3 : 5 : 7.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 11 Question Id : 630680345401 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct as per the Hund's rules?

I. Of the terms arising from equivalent electrons, those with largest multiplicity will have the highest energy.

II. Terms arising from half-filled sub-shells show only very slight fine-structure splitting.

Options :

1. ✖ Only I

2. ✔ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 12 Question Id : 630680345402 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct?

I. When the external magnetic field becomes stronger as compared with the internal fields, magnetic coupling between $\vec{J}$ and $\vec{B}\vec{B}$ exceeds that between $\vec{L}$ and $\vec{S}$.

II. On increasing the external magnetic field, anomalous zeeman pattern changes over to like normal zeeman pattern. This process is known as Paschem-Back effect.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 13 Question Id : 630680345403 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct?

I. Two Bose particles can exist in the same quantum state.

II. Two Fermi particles cannot exist in the same quantum state.

III. Electron is a fermi particle.

Options :

1.

✖ Only II

2. ✖ Only II and III

3. ✖ Only I and III

4. ✔ I, II and III

Question Number : 14 Question Id : 630680345404 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct regarding the spectrum of Helium?

I. Triple states do not combine with singlet states.

II. The singlet states lie a little deeper than the corresponding triplet states.

III. The difference between the ground state and the lowest excited state is relatively large.

Options :

1. ✖ Only III

2. ✖ Only I and II

3. ✔ Only I and III

4. ✖ I, II and III

Question Number : 15 Question Id : 630680345405 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is/are the correct pair(s) of state and spin for the spectrum of Helium?

I. Singlet state – Parallel spins

II. Triplet state – Antiparallel spins

Options :

1. ✖ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✔ Neither I nor II

Question Number : 16 Question Id : 630680345406 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pair(s) of possible total spin quantum numbers which can be obtained by combining several independent electron spins?

I. 3 electrons – S = 2

II. 4 electrons – S = 1

Options :

1. ✖ Only I

2. ✔ Only II

3. ✖ Both I and II

4.

✖ Neither I nor II

Question Number : 17 Question Id : 630680345407 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pair(s) of J-level and its corresponding equispaced Zeeman levels is\are correct?

I. J = 1/2 – Zeeman levels

II. J = 3/2 – 4 Zeeman levels

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 18 Question Id : 630680345408 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following in increasing order of their spin.

I. Neutron

II. α – particle

III. Photon

Options :

1. ✖ I, II, III

2. ✔ II, I, III

3. ✖ I, III, II

4. ✖ II, III, I

Question Number : 19 Question Id : 630680345409 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A bus accelerates on a horizontal road due to the force exerted by _____.

Options :

1. ✔ the road

2. ✖ the driver of the bus

3. ✖ the gravity

4. ✖ the passengers of the bus

Question Number : 20 Question Id : 630680345410 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A box of mass 10 kg is pulled on a horizontal surface by applying a horizontal force. If the coefficient of kinetic friction between the box and the surface is 0.15, then what is the force of friction exerted by the horizontal surface on the box? (Use $g = 9.8\ ms^{-2}$)

Options :

1. ✖ 12 N

2. ✖ 7.5 N

3. ✔ 14.7 N

4. ✖ 21.3 N

Question Number : 21 Question Id : 630680345411 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A spring of spring constant 20 N/m is compressed from its natural position by 2 cm. What will be the work done by the spring-force?

Options :

1. ✖ 4×10^{-3} J

2. ✔ -4×10^{-3} J

3. ✖ 8×10^{-3} J

4. ✖ -8×10^{-3} J

Question Number : 22 Question Id : 630680345412 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The radius vector from the sun to the planet sweeps out an area, A_1 in 30 days when it is closer to the sun and area, A_2 in 30 days when it is far away from the sun. Which of the following is correct regarding A_1 and A_2?

Options :

1. ✖ $A_1 > A_2$

2. ✖ $A_1 < A_2$

3. ✔ $A_1 = A_2$

4. ✖ No conclusion can be drawn as the date is not sufficient

Question Number : 23 Question Id : 630680345413 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

If a is the semi-major axis, and T is the time period, then which of the following is correct according to Kepler's third law?

Options :

1. ✖ $T \alpha a^2$

2. ✖ $T^3 \alpha a^2$

3. ✖ $T \alpha a^3$

4. ✔ $T^2 \alpha a^3$

Question Number : 24 Question Id : 630680345414 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is the correct relation between coefficient of static fiction, μ_S and coefficient of kinetic friction μ_K?

Options :

1. ✖ $\mu_S \leq \mu_k$

2. ✖ $\mu_S = \mu_k$

3. ✔ $\mu_S \geq \mu_k$

4. ✖ $\mu_S < \mu_k$

Question Number : 25 Question Id : 630680345415 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

If the earth stops rotating, the apparent value of acceleration due to gravitation on its surface will _____.

Options :

1. ✖ remain same everywhere

2. ✖ increases everywhere

3. ✖ decreases everywhere

4. ✔ increase at most places and remains the same at some places

Question Number : 26 Question Id : 630680345416 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

If the length of a uniform solid cylinder gets doubled then what will be the impact on its moment of inertia?

Options :

1. ✖ It gets doubled

2. ✖ It gets halved

3. ✔ No change

4. ✖ It gets 4 times the original value

Question Number : 27 Question Id : 630680345417 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Phase difference for two waves in the same direction is π radians. Amplitudes of two waves are 3 m and 4 m respectively. What will be the amplitude of the wave formed by combining these two waves?

Options :

1. ✔ 1 m

2. ✖ 3 m

3. ✖ 4 m

4. ✖ 5 m

Question Number : 28 Question Id : 630680345418 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A block of mass M is placed on a smooth wedge of inclination θ. The whole system is accelerated horizontally so that the block does not slip on the wedge. What is the magnitude of the force exerted by the wedge on the block?

Options :

1. ✖ $Mg \sin\theta$

2. ✖ $Mg/\sin\theta$

3. ✖ $Mg \cos\theta$

4. ✔ $Mg/\cos\theta$

Question Number : 29 Question Id : 630680345419 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A particle is going in a spiral path with constant speed. Which of the following statements(s) is/are correct?

I. The magnitude of acceleration is constant

II. The velocity of the particle is constant

Options :

1. ✔ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 30 Question Id : 630680345420 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In non-inertial frame, which of the following equation(s) is/are correct?

I. $L = I\omega$

II. $\frac{dL}{dt} = \Gamma$

Where, L is the angular momentum, I is the moment of Inertia, Γ is the torque, ω is angular speed and t is the time.

Options :

1. ✔ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 31 Question Id : 630680345421 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct for a head-on elastic collision of two bodies of equal masses?

I. One of the bodies will come to rest.

II. The velocities of the bodies will be interchanged.

III. The faster body will slows down and the slower body will come to rest.

Options :

1. ✖ Only I and II

2. ✔ Only II

3.

✖ Only III

4. ✖ I, II and III

Question Number : 32 Question Id : 630680345422 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In the context of planetary motion, arrange the following according to the years (first to last) which they represented their theories?

I. Aryabhat's Aryabhatiya

II. Newton's Gravitational law

III. Kepler's laws of planetary motion

Options :

1. ✖ I, II, III

2. ✔ I, III, II

3. ✖ III, I, II

4. ✖ III, II, I

Question Number : 33 Question Id : 630680345423 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following.

	Type of collision		Coefficient of restitution
I	Inelastic	1	0.6
II	Semi-elastic	2	1
III	Perfectly elastic	3	0

Options :

1. ✖ I-2, II-1, III-3

2. ✖ I-1, II-2, III-3

3. ✖ I-3, II-2, III-1

4. ✔ I-3, II-1, III-2

Question Number : 34 Question Id : 630680345424 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct?

I. The force of friction is not conservative

II. Kinetic energy and potential energy, taken together form mechanical energy

III. Energy can be created or destroyed

Options :

1. ✔ Only I and II

2. ✖ Only II and III

3. ✖ Only I and III

4. ✖ I, II and III

Question Number : 35 Question Id : 630680345425 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pair is/are correct for a simple harmonic motion?

I. $\vec{F} \cdot \vec{r} - negative$

II. $\vec{F} \times \vec{a} - zero$

Where, F is the force, r is the position and a is the acceleration.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 36 Question Id : 630680345426 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The reciprocal of the reciprocal lattice would result in _____.

Options :

1. ✖ inverse lattice

2. ✔ direct lattice

3. ✖ sub-lattice

4. ✖ both direct lattice and sub-lattice

Question Number : 37 Question Id : 630680345427 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is not a state for Type-II semi-conductors?

Options :

1. ✔ Failure state

2. ✖ Normal state

3. ✖ Superconducting state

4. ✖ Vortex state

Question Number : 38 Question Id : 630680345428 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the coordination number of Hexagonal close Packed (hcp) structure?

Options :

1. ✖ 6

2. ✖ 8

3. ✔ 12

4. ✖ 16

Question Number : 39 Question Id : 630680345429 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is correct for specific heat models?

Options :

1. ✖ Einstein model usually gives higher specific heat than Debye model

2. ✔ Einstein model usually gives lower specific heat than Debye model

3. ✖ Both Einstein and Debye model gives equal values of specific heat

4. ✖ No comparison can be drawn for Einstein and Debye model.

Question Number : 40 Question Id : 630680345430 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The Atomic packing fraction of body-centered cubic structure is _____.

Options :

1. ✖ 52.6 percent

2. ✔ 68 percent

3. ✖ 74 percent

4. ✖ 78 percent

Question Number : 41 Question Id : 630680345431 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct for Orthorhombic crystal?

I. All sides of unit cell are equal i.e. a = b = c

II. All the sides of unit cell are at right angle to each other i.e. $\alpha = \beta = \gamma = 90$ degree

Options :

1. ✖ Only I

2. ✔ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 42 Question Id : 630680345432 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct?

I. BCC Bravais lattice can be described as a unit cell with two point basis

II. FCC Bravais lattice can be described as a unit cell with four-point basis

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 43 Question Id : 630680345433 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct for a reciprocal lattice?

I. Each vector of the reciprocal lattice is normal to a set of lattice planes of the direct lattice.

II. $|K|$ is inversely proportional to the spacing of the lattice planes normal to K, if the components of K have no common factors.

III. The Miller indices which identify the direct lattice planes are also the integers that identify the reciprocal lattice vectors normal to those planes.

Options :

1. ✖ Only I

2. ✖ Only I and II

3. ✖ Only II and III

4. ✔ I, II and III

Question Number : 44 Question Id : 630680345434 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following.

	Structure		Coordination number
I	Simple Cubic	1	8
II	Body Centered Cubic	2	12
III	Face Centered Cubic	3	6

Options :

1. ✖ I-2, II-1, III-3

2. ✖ I-2, II-3, III-1

3. ✔ I-3, II-1, III-2

4. ✖ I-3, II-2, III-1

Question Number : 45 Question Id : 630680345435 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following.

	Crystal		Properties
I	Triclinic	1	$a \neq b \neq c, \alpha = \beta = 90 \text{ degree} \neq \gamma$
II	Tetragonal	2	$a \neq b \neq c, \alpha \neq \beta \neq \gamma$
III	Monoclinic	3	$a = b \neq c, \alpha = \beta = \gamma = 90 \text{ degree}$

Options :

1. ✔ I-2, II-3, III-1

2. ✖ I-2, II-1, III-3

3. ✖ I-3, II-1, III-2

4. ✖ I-3, II-2, III-1

Question Number : 46 Question Id : 630680345436 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following according to the years (first to last) in which they were termed.

I. Solid state physics

II. Condensed physics

III. Drude's model of metals

Options :

1. ✔ III, I, II

2. ✖ III, II, I

3. ✖ I, III, II

4. ✖ I, II, III

Question Number : 47 Question Id : 630680345437 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A metallic particle having no net charge is placed near a finite metal plate carrying a negative charge, the electric force on the particle will be _____.

Options :

1. ✖ zero

2. ✖ parallel to the plate

3. ✖ toward the plate

4. ✔ away from the plate

Question Number : 48 Question Id : 630680345438 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT a Maxwell equation?

Options :

1. ✖ Gauss's law for electricity

2. ✖ Faraday's law

3. ✖ Gauss's law for magnetism

4. ✔ Lenz law

Question Number : 49 Question Id : 630680345439 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Speed of electromagnetic waves is independent of _____.

Options :

1. ✖ Wavelength

2. ✖ Material

3. ✖ Frequencies

4. ✔ Intensity

Question Number : 50 Question Id : 630680345440 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

_____ helps us to find the direction of the induced current in a conducting loop.

Options :

1. ✖ Gauss's law

2. ✔ Lenz law

3. ✖ Curie's law

4. ✖ Faraday law

Question Number : 51 Question Id : 630680345441 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The energy stored in an inductor, carrying a current, i is _____. (where L is the self-inductance)

Options :

1. ✔ $\frac{1}{2}Li^2$

2. ✖ Li^2

3. ✖ $2Li^2$

4. ✖ $\frac{1}{4}Li^2$

Question Number : 52 Question Id : 630680345442 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What will be the combined inductance of a circuit in which two inductor of inductances 20 mH and 40 mH are connected in series?

Options :

1. ✖ 40 mH

2. ✔ 60 mH

3. ✖ 40/3 mH

4. ✖ 20 mH

Question Number : 53 Question Id : 630680345443 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A long solenoid is formed by winding 30 turns cm^{-1}. How much magnetic field is produced inside the solenoid from 7A current?

Options :

1. ✖ 13.2 mT

2. ✖ 21 mT

3. ✔ 26.4 mT

4. ✖ 42 mT

Question Number : 54 Question Id : 630680345444 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A vertical wire carrying a current in the downward directions is placed in a magnetic field going from West to East. What will be the direction of Force experienced by the wire?

Options :

1. ✔ North to South

2.

✖ South to North

3. ✖ East to West

4. ✖ West to East

Question Number : 55 Question Id : 630680345445 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct?

I. $\oint \vec{E} \cdot d\vec{s} = q/\varepsilon_o$

II. $\oint \vec{B} \cdot d\vec{s} = 0$

Where $\vec{E}$ is the electric field, $\vec{s}$ is the area vector. $\vec{B}$ is the magnetic field, q is the current and ε_0 is the permittivity of free space.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 56 Question Id : 630680345446 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct?

I. An ammeter should have large resistance

II. A voltmeter should have small resistance

Options :

1. ✖ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✔ Neither I nor II

Question Number : 57 Question Id : 630680345447 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A charged particle moves in a gravity-free space without change in velocity. Which of the following statement(s) is/are possible?

I. $E = 0, B = 0$

II. $E \neq 0, B = 0$

III. $E \neq 0, B \neq 0$

Options :

1. ✖ Only I and II

2. ✖ Only II and III

3. ✔ Only I and III

4. ✖ I, II and III

Question Number : 58 Question Id : 630680345448 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is/are correct?

I. Magnetic field at the centre of a circular loop of radius, a carrying current, i is given by $\frac{\mu_o i}{2a}$.

II. Magnetic field due to a long, straight wire carrying a current, i at a distance, d is given by $\frac{\mu_o i}{\pi d}$.

III. Magnetic field inside a solenoid having n turns carrying current, i is given by $\mu_0 ni$.

Options :

1. ✖ Only I and II

2. ✖ Only II and III

3. ✔ Only I and III

4. ✖ I, II and III

Question Number : 59 Question Id : 630680345449 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following.

	Law		Formula
I	Gauss's law	1	$\oint \vec{B} \cdot d\vec{l} = \mu_{\circ} i$
II	Ampere law	2	$dB = \frac{\mu_{\circ}}{4\pi} i \frac{d\vec{l} \times \vec{r}}{r^3}$
III	Biot – Savart law	3	$\phi = \oint \vec{E} \cdot d\vec{s}$

Where B is the magnetic field, $d\vec{l}$ is the length vector of the current element, μ_0 is the permeability of vacuum, i is the current, $\vec{r}$ is the position vector, E is the electric field, ϕ is the electric flux and $d\vec{s}$ is the area vector.

Options :

1. ✔ I-3, II-1, III-2

2. ✖ I-3, II-2, III-1

3. ✖ I-2, II-1, III-3

4. ✖ I-2, II-3, III-1

Question Number : 60 Question Id : 630680345450 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following.

	Term		Unit
I	Electric field	1	Volt-metre
II	Magnetic field	2	Volt/metre
III	Electric flux	3	Tesla

Options :

1. ✖ I-2, II-1, III-3

2. ✔ I-2, II-3, III-1

3. ✖ I-1, II-2, III-3

4. ✖ I-1, II-3, III-2

Question Number : 61 Question Id : 630680345451 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following in increasing order of their curie temperatures.

I. Fe_2O_3

II. Iron

III. Nickel

Options :

1. ✖ I, II, III

2. ✔ I, III, II

3. ✖ III, I, II

4. ✖ III, II, I

Question Number : 62 Question Id : 630680345452 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following according to the years (first to last) in which they were discovered.

I. Gauss law

II. Coloumb's law

III. Kepler law

Options :

1. ✔ III, II, I

2. ✖ III, I, II

3. ✖ II, I, III

4. ✖ I, II, III

Question Number : 63 Question Id : 630680345453 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following according to the years (first to last) in which they put up their theories.

I. Hertz

II. Faraday

III. Maxwell

Options :

1. ✖ I, II, III

2. ✖ I, III, II

3. ✔ II, III, I

4. ✖ II, I, III

Question Number : 64 Question Id : 630680345454 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Transistors are identified with a prefix of 2N followed by up to _____ digits.

Options :

1. ✖ two

2. ✖ three

3. ✔ four

4. ✖ five

Question Number : 65 Question Id : 630680345455 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In a properly biased transistor, the emitter based junction is _____ biased and collector based junction is _____ biased.

Options :

1. ✔ forward, reverse

2. ✖ reverse, forward

3. ✖ forward, forward

4. ✖ reverse, reverse

Question Number : 66 Question Id : 630680345456 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT correct for integrated circuit?

Options :

1. ✔ It is not economical to produce

2. ✖ It is reliable with complex circuits

3. ✖ It offers small size and weight

4. ✖ It meets the need for low power consumption

Question Number : 67 Question Id : 630680345457 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT a construction method of Integrated Circuit?

Options :

1. ✖ Monolithic

2. ✖ Thin-film

3. ✖ Hybrid

4. ✔ Small-Scale Integration

Question Number : 68 Question Id : 630680345458 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

_____ is useful for audio amplification of all frequencies.

Options :

1. ✔ RC coupling

2. ✖ Impedance coupling

3. ✖ Transformer coupling

4. ✖ Zener diode

Question Number : 69 Question Id : 630680345459 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct?

I. Clapp Oscillator is a Sinusoidal oscillator.

II. Shunt-Fed Hartley oscillator is a Non Sinusoidal Oscillator.

III. Relaxation Oscillator is a non-sinusoidal Oscillator.

Options :

1. ✖ Only I

2. ✖ Only I and II

3. ✔ Only I and III

4. ✖ I, II and III

Question Number : 70 Question Id : 630680345460 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following.

	Type		Bandwidth
I	AM Radio	1	6 MHz
II	Television	2	150 KHz
III	FM Radio	3	10 KHz

Options :

1. ✖ I-2, II-1, III-3

2. ✖ I-2, II-3, III-1

3. ✖ I-3, II-2, III-1

4. ✔ I-3, II-1, III-2

Question Number : 71 Question Id : 630680345461 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following amplifiers according to the stages in which they are used (first to last) in an operational amplifier.

I. Voltage amplifier

II. Output amplifier

III. Differential amplifier

Options :

1. ✖ I, III, II

2. ✔ III, I, II

3. ✖ I, II, III

4. ✖ III, II, I

Question Number : 72 Question Id : 630680345462 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following according to the years (first to last) in which the method is commonly used for diode construction.

I. Diffused Junction method

II. Grown Junction method

III. Alloyed Junction method

Options :

1. ✖ I, II, III

2. ✖ I, III, II

3. ✔ II, III, I

4. ✖ II, I, III

Question Number : 73 Question Id : 630680345463 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What will be the mean of the binomial distribution with n = 10, p = 0.75?

Options :

1. ✔ 7.5

2. ✖ 2.5

3. ✖ 1.875

4. ✖ 3.75

Question Number : 74 Question Id : 630680345464 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What will be the standard deviation of the binomial distribution with n = 16 and p = 0.5?

Options :

1. ✖ 5

2. ✖ 4

3. ✔ 2

4. ✖ $\sqrt{2}$

Question Number : 75 Question Id : 630680345465 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The magnitude of $\vec{A} \times \vec{B}$, where $\vec{A} = 3\hat{\imath}$ and $\vec{B} = 5\hat{\jmath}$ is _____.

Options :

1. ✖ 0

2. ✔ 15

3. ✖ 4

4. ✖ $\sqrt{34}$

Question Number : 76 Question Id : 630680345466 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Let X be a random variable with the probability mass function,

$$f(x) = \begin{cases} nk & n\varepsilon\{1,2,3,4,5\} \\ 0 & otherwise \end{cases}$$

What is the value of k?

Options :

1. ✔ 1/15

2. ✖ 1/5

3. ✖ 1/10

4. ✖ 1/25

Question Number : 77 Question Id : 630680345467 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Let X be a random variable with probability distribution function,

$$f(x) = \begin{cases} x^2/k & x\varepsilon[0,3] \\ 0 & otherwise \end{cases}$$

What is the value of k?

Options :

1. ✖ 27

2. ✖ 3

3. ✔ 9

4. ✖ 243

Question Number : 78 Question Id : 630680345468 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

If E denotes the expectation of random variable X, then what is the expression for its variance?

Options :

1. ✖ $[E(X)]^2$

2. ✖ $E(X^2)$

3. ✔ $E(X^2) - [E(X)]^2$

4. ✖ $\frac{E(X^2)}{[E(X)]^2}$

Question Number : 79 Question Id : 630680345469 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

If X is a uniformly distributed random variable between 0 to 5. The value of $E(X^2)$ is _____.

Options :

1. ✖ 25

2. ✖ 125

3. ✔ 25/3

4. ✖ 125/3

Question Number : 80 Question Id : 630680345470 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

If $\vec{a} = 3i + 4j$ and $\vec{b} = 5\hat{i} + 12\hat{j}$ what is the angle between $\vec{a}$ and $\vec{b}$?

Options :

1. ✔ $\cos^{-1}(63/65)$

2. ✖ $\sin^{-1}(63/65)$

3. ✖ $\cos^{-1}(5/13)$

4. ✖ $\sin^{-1}(5/13)$

Question Number : 81 Question Id : 630680345471 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The mean and variance of exponential distribution is _____ and _____ respectively. (where λ is the rate parameters)

Options :

1. ✖ λ^2, λ

2. ✖ $\frac{1}{\lambda^2}, \frac{1}{\lambda}$

3. ✖ λ, λ^2

4. ✔ $\frac{1}{\lambda}, \frac{1}{\lambda^2}$

Question Number : 82 Question Id : 630680345472 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to normal distribution is/are correct?

I. The probability of $P(Z < 1.645)$ for a normal distribution is almost 95 percent.

II. The probability of $P(Z < 2.33)$ for a normal distribution is almost 97 percent.

Options :

1. ✔ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 83 Question Id : 630680345473 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement related to vector algebra is/are correct?

I. Dot product is a scalar quantity

II. Cross product is not commutative

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 84 Question Id : 630680345474 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to Poisson distribution is/are correct?

I. Mean and standard deviation of poisson process are equal.

II. Poisson distribution is a continuous probability distribution.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✔ Neither I nor II

Question Number : 85 Question Id : 630680345475 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to binomial distribution is/are correct?

I. Mean of Binomial distribution with n terms and probability of success, p is np.

II. Poisson process is used for describing inter-arrival time.

III. Normal distribution is a discrete probability distribution.

Options :

1. ✖ Only III

2. ✔ Only I and II

3. ✖ Only I and III

4. ✖ I, II and III

Question Number : 86 Question Id : 630680345476 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to vector algebra is/are correct?

I. The magnitude of $\vec{A} = 3\hat{\imath} + 4\hat{\jmath}$ is 5 units.

II. Dot product of $(10\hat{\imath} + 5\hat{k})$ and $(2\hat{\jmath} + 3\hat{k})$ is 15 units.

III. Cross product has both magnitude and direction.

Options :

1. ✖ Only III

2. ✖ Only I and II

3. ✖ Only I and III

4. ✔ I, II and III

Question Number : 87 Question Id : 630680345477 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Consider a normal distribution of a random variable X, mean μ, and standard deviation σ, then match the following

	Distribution		Z-Score
I	$\mu = 10, \sigma = 12, X = 14$	1	0.5
II	$\mu = 2, \sigma = 3, X = 5$	2	0.33
III	$\mu = 5, \sigma = 2, X = 6$	3	1.0

Options :

1. ✖ I-2, II-1, III-3

2. ✔ I-2, II-3, III-1

3. ✖ I-3, II-1, III-2

4. ✖ I-3, II-2, III-1

Question Number : 88 Question Id : 630680345478 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following related to the properties of vector quantities

	Expression		Value
I	$\lvert 2\hat{\imath} + 3j \rvert$	1	0
II	$(5i) \cdot (2\hat{\imath} + 5\hat{\jmath})$	2	$\sqrt{13}$
III	$(2\hat{\imath}).(3\hat{\jmath} + 15\hat{k})$	3	10

Options :

1. ✔ I-2, II-3, III-1

2. ✖ I-3, II-1, III-2

3. ✖ I-2, II-1, III-3

4. ✖ I-3, II-2, III-1

Question Number : 89 Question Id : 630680345479 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is/are the correct pair(s) related to two vectors $\vec{a}$ and $\vec{b}$?

I. $\vec{a} \cdot \vec{b}$ ---- scalar

II. $\vec{a} \times \vec{b}$ ------ vector

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 90 Question Id : 630680345480 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following related to probability distribution functions of random variables is/are correct pair(s)?

I. Discrete distribution – probability density function

II. Continuous distribution – probability mass function

Options :

1. ✖ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✔ Neither I nor II

Question Number : 91 Question Id : 630680345481 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following vectors in increasing order of their magnitude.

I. $2\hat{\imath} + 3\hat{\jmath}$

II. $3\hat{\imath} - 4\hat{\jmath}$

III. $\hat{\imath} - 6\hat{\jmath}$

Options :

1. ✖ III, II, I

2. ✖ I, III, II

3. ✖ III, I, II

4. ✔ I, II, III

Question Number : 92 Question Id : 630680345482 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following means of n numbers in increasing orders. (Considering they are not equal)

I. Geometric mean

II. Arithmetic mean

III. Harmonic mean

Options :

1. ✖ III, II, I

2. ✖ II, I, III

3. ✔ III, I, II

4. ✖ II, III, I

Question Number : 93 Question Id : 630680345483 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following mathematicians according to the years (first to last) in which they published their theories?

I. Laplace

II. Jacob Bernoulli

III. R.A Fisher

Options :

1. ✔ II, I, III

2. ✖ II, III, I

3.

✖ I, II, III

4. ✖ I, III, II

Question Number : 94 Question Id : 630680345484 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following theories according to the years (first to last) in which they get published?

I. Black-Scholes formula

II. Kolmogorov's axioms

III. Law of large numbers

Options :

1. ✖ I, II, III

2. ✔ III, I, II

3. ✖ I, III, II

4. ✖ III, II, I

Question Number : 95 Question Id : 630680345485 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

An important class of interaction, where the projectile becomes loosely bound in the nucleus and share its energy with all the nuclear constituents is called _____.

Options :

1. ✖ Stripping reaction

2. ✔ Compound nucleus reaction

3. ✖ Pick-up reaction

4. ✖ Direct reaction

Question Number : 96 Question Id : 630680345486 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT a correct set of four quantum numbers (n, l, m_l, m_s) for any atom?

Options :

1. ✖ $(3, 2, 1, +1/2)$

2. ✖ $(2, 1, 0, -1/2)$

3. ✔ $(3, 3, -2, -1/2)$

4. ✖ $(2, 1, -1, +1/2)$

Question Number : 97 Question Id : 630680345487 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following possibility of first excited state of ${}^{17}_{8}O$ corresponds to the lowest energy shift?

Options :

1. ✔ $1d_{5/2} \rightarrow 2s_{1/2}$

2. ✖ $1p_{1/2} \rightarrow 1d_{5/2}$

3. ✖ $1p_{1/2} \rightarrow 1d_{3/2}$

4. ✖ $1p_{1/2} \rightarrow 1s_{1/2}$

Question Number : 98 Question Id : 630680345488 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

If the number of neutrons produced in the $(n+1)^{th}$ stage of fission is more than that of neutrons produced in the n^{th} stage of fission, the process is said to be _____.

Options :

1. ✖ optimal

2. ✖ critical

3. ✔ super-critical

4. ✖ sub-critical

Question Number : 99 Question Id : 630680345489 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Critical mass of uranium ^{235}U that would be necessary to produce a nuclear explosion is a sphere of radius of about _____.

Options :

1. ✔ 7 cm

2. ✖ 2 cm

3. ✖ 9 cm

4. ✖ 5 cm

Question Number : 100 Question Id : 630680345490 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The number of protons is the nucleus is represented by the symbol _____.

Options :

1. ✖ N

2. ✖ A

3. ✔ Z

4. ✖ P

Question Number : 101 Question Id : 630680345491 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

_____ are the atoms of different elements having equal number of neutrons in the atomic nucleus.

Options :

1. ✔ Isotones

2. ✖ Isobars

3. ✖ Isotopes

4. ✖ Nucleons

Question Number : 102 Question Id : 630680345492 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The SI unit of activity in radio active decay processes is the _____.

Options :

1. ✖ curie

2. ✖ henry

3. ✔ becquerel

4. ✖ newton

Question Number : 103 Question Id : 630680345493 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the correct relationship between half-life, $T_{1/2}$ and mean life, τ of a radioactive decay process?

Options :

1. ✖ $\tau = T_{1/2} \ln 2$

2. ✖ $\tau = T_{1/2} \ln 3$

3. ✔ $T_{1/2} = \tau \ln 2$

4. ✖ $T_{1/2} = \tau \ln 3$

Question Number : 104 Question Id : 630680345494 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct regarding the drops of various sizes as per the classical model of liquid drop?

I. The Interior mass densities are approximately equal.

II. Latent heats of vaporization are proportional to their masses.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 105 Question Id : 630680345495 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to shell structure of atom is/are correct?

I. For every principle quantum number, n, the maximum value of orbital angular momentum quantum number is n + 1.

II. For any value of orbital angular momentum quantum number, L, there are (2L + 1) sub-states with different values of projection of orbital angular momentum along any chosen axis.

Options :

1. ✖ Only I

2. ✔ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 106 Question Id : 630680345496 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to α-particle decay is/are correct?

I. The probability per unit time of the α-particle escaping from the nucleus is proportional to the probability of finding the α-particle in the nucleus.

II. The probability per unit time of the α-particle escaping from the nucleus is proportional to the frequency of the collisions of α particle with the barriers.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 107 Question Id : 630680345497 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to nuclear reactions is/are correct?

I. Elastic Scattering is an example of direct reaction.

II. Inelastic Scattering is also an example of direct reaction.

III. Stripping reaction is the inverse of a pick-up reaction.

Options :

1. ✖ Only I

2. ✖ Only I and III

3. ✖ Only II and III

4. ✔ I, II and III

Question Number : 108 Question Id : 630680345498 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to parity and wavefunction is/are correct?

I. Intrinsic parity for nucleons is defined to be positive.

II. Parity is a transformation.

III. The wavefunction of single particle quantum state will contain an angular part proportional to the spherical harmonic.

Options :

1. ✖ Only I and II

2. ✖ Only II and III

3. ✖ Only I and III

4. ✔ I, II and III

Question Number : 109 Question Id : 630680345499 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pairs related to nuclear force and spin are correct?

I. Nucleon -Nucleon forces : Spin-independent

II. Antiparallel spins : No bound states

Options :

1. ✖ Only I

2. ✔ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 110 Question Id : 630680345500 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is the correct order (first to last) of the corrections applied to the mass of the constituent nucleons and electrons as per the classical model of liquid drops?

I. Coloumb term

II. Asymmetry term

III. Volume term

Options :

1. ✔ III, I, II

2. ✖ III, II, I

3. ✖ I, II, III

4. ✖ I, III, II

Question Number : 111 Question Id : 630680345501 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following in increasing order of their mass numbers.

I. Uranium

II. Nickel

III. Neon

Options :

1. ✖ I, II, III

2. ✔ III, II, I

3. ✖ I, III, II

4. ✖ III, I, II

Question Number : 112 Question Id : 630680345502 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Let A be a Hermitian operator that commutes with H′. If Ψ_a^0 and Ψ_b^0 are eigenfunctions of A with distinct eigenvalues, and $W_{ab} = <\psi_a^0|H'|\psi_b^0>$, then _____.

Options :

1. ✖ $W_{ab} = \infty$

2. ✔ $W_{ab} = 0$

3. ✖ $W_{ab} = \Psi_a^0 + \Psi_b^0$

4. ✖ $W_{ab} = \frac{\Psi_a^0}{\Psi_b^0}$

Question Number : 113 Question Id : 630680345503 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The Schrodinger equation in quantum mechanics is analogous to _____ in classical mechanics.

Options :

1. ✖ Newton's first law

2. ✔ Newton's second law

3. ✖ Newton's third law

4. ✖ Heisenberg uncertainty principle

Question Number : 114 Question Id : 630680345504 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following represents Ehrenfest's theorem?

Options :

1. ✔ $\frac{d<p>}{dt} = <-\frac{\partial v}{\partial x}>$

2. ✖ $\frac{d<p>}{dt} = m\frac{d<x>}{dt}$

3. ✖ $\frac{d<v>}{dt} = \frac{d^2<x>}{dt^2}$

4. ✖ $\frac{d<p>}{dt} = mv$

Question Number : 115 Question Id : 630680345505 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A spinning charged particle constitutes a magnetic dipole, its magnetic dipole moment is proportional to its _____.

Options :

1. ✖ linear angular momentum

2. ✔ spin angular momentum

3. ✖ linear torque

4. ✖ spin torque

Question Number : 116 Question Id : 630680345506 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The force on a particle of charge q, moving with velocity v, through an electric field E, and magnetic field B, is given by Lorentz force law as per the equation _____.

Options :

1. ✖ $F = q\,(B + v \times E)$

2. ✖ $F = q\,(B + v.E)$

3. ✔ $F = q\,(E + v \times B)$

4. ✖ $F = q\,(E + v.B)$

Question Number : 117 Question Id : 630680345507 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Para helium has _____ spin configuration and Otho helium has _____ spin configuration.

Options :

1. ✔ Antisymmetric, Symmetric

2. ✖ Symmetric, Anti Symmetric

3. ✖ Antisymmetric, Antisymmetric

4. ✖ Symmetric, Symmetric

Question Number : 118 Question Id : 630680345508 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

_____ states that the state with the highest total spin will have the lowest energy.

Options :

1. ✔ Hunds first rule

2. ✖ Hunds second rule

3. ✖ Hunds third rule

4. ✖ Heisenberg principle

Question Number : 119 Question Id : 630680345509 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following represents the uncertainty principle correctly?

Options :

1. ✖ $\Delta x \Delta v \geq \frac{\hbar}{2\pi}$

2. ✖ $\Delta x \Delta p \geq \frac{\hbar}{2\pi}$

3. ✖ $\Delta x \Delta v \geq \frac{\hbar}{2}$

4. ✔ $\Delta x \Delta p \geq \frac{\hbar}{2}$

Question Number : 120 Question Id : 630680345510 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

According to the Fermi's golden rule, transition rate is the _____ of the matrix element of an operator V between initial and final states times the density of states.

Options :

1. ✖ square-root

2. ✔ square

3. ✖ cube-root

4. ✖ cube

Question Number : 121 Question Id : 630680345511 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to perturbation theory is/are correct?

I. First order correction to the Energy is the expectation value of the perturbation in the unperturbed state.

II. Perturbation theory is a systematic procedure for obtaining approximate solutions to the perturbed problem, by building on the known exact solution to the unperturbed case.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 122 Question Id : 630680345512 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct?

I. Hamilton equation requires 3D coordinates for calculation.

II. Hamilton operator is the sum of static and kinetic energy of particles.

Options :

1. ✔ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 123 Question Id : 630680345513 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) is/are correct?

I. De Brogile uses Einstein and Plank results to prove his hypothesis.

II. According to De Broglie, if the velocity of particle is infinite, wavelength will be zero.

III. According to De Brogile, the wavelength of electron is inversely proportional to velocity of particles.

Options :

1. ✖ Only II

2. ✖ Only III

3. ✖ Only I and III

4. ✔ I, II and III

Question Number : 124 Question Id : 630680345514 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to Schrodinger equation is/are correct?

I. Schrodinger equation is a linear form of equation.

II. Schrodinger equation is an ordinary differential equation.

III. Schrodinger equation governs wave form of quantum mechanics.

Options :

1. ✖ Only III

2. ✖ Only I and II

3. ✔ Only I and III

4. ✖ Only II and III

Question Number : 125 Question Id : 630680345515 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following pairs related to famous experimental observations of quantum mechanics

	Experiment		Observations
I	Stern and Gerlach	1	Spin of electrons
II	GP Thomson	2	Scattering experiment through celluloid
III	Davison and Germer	3	Scattering by the surface of crystal of nickel

Options :

1. ✖ I-2, II-3, III-1

2. ✖ I-2, II-1, III-3

3. ✖ I-1, II-3, III-2

4. ✔ I-1, II-2, III-3

Question Number : 126 Question Id : 630680345516 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is/are correct pairs for Schrodinger equation?

I. Time independent – $H\psi = E\psi$

II. Time dependent – $\frac{-\hbar^2}{2m}\frac{d^2\psi}{dx^2} + V\psi = E\psi$

Options :

1. ✔ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 127 Question Id : 630680345517 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following series related to hydrogen atom in increasing order of their wavelengths.

I. Balmer Series

II. Lyman Series

III. Paschen Series

Options :

1. ✔ II, I, III

2. ✖ II, III, I

3.

✖ I, II, III

4. ✖ I, III, II

Question Number : 128 Question Id : 630680345518 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following experimental observations according to the years (first to last) in which they were discovered.

I. Young's Double Slit Experiment

II. Kirchoff's Black body concept

III. Hertz photoelectric effect

Options :

1. ✔ I, II, III

2. ✖ I, III, II

3. ✖ II, I, III

4. ✖ II, III, I

Question Number : 129 Question Id : 630680345519 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following theoretical breakthrough in quantum mechanics according to the year (first to last) in which they were discovered.

I. Neil Bohr's model of atom

II. Einstein special theory of Relativity

III. John Hasbrouck Van Vleck's crystal field theory

Options :

1. ✖ I, II, III

2. ✖ I, III, II

3. ✔ II, I, III

4. ✖ II, III, I

Question Number : 130 Question Id : 630680345520 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What will be the rms speed of oxygen molecule in a gas at 270K?

Options :

1. ✖ $483\ ms^{-1}$

2. ✔ $458\ ms^{-1}$

3. ✖ $432\ ms^{-1}$

4. ✖ $418\ ms^{-1}$

Question Number : 131 Question Id : 630680345521 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

At _____, all three phases remain in equilibrium.

Options :

1. ✔ triple point

2. ✖ equilibrium point

3. ✖ meting point

4. ✖ boiling point

Question Number : 132 Question Id : 630680345522 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the relationship between coefficient of linear expansion α and coefficient of volume expansion γ?

Options :

1. ✖ $\gamma = \alpha^3$

2. ✔ $\gamma = 3\alpha$

3. ✖ $\alpha = \gamma^3$

4. ✖ $\alpha = 3\gamma$

Question Number : 133 Question Id : 630680345523 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The formula for most probable speed is _____. (where T is temperature, k is the Boltzman constant and m is the mass of molecule of gas)

Options :

1. ✖ $\sqrt{\frac{3kT}{m}}$

2. ✖ $\sqrt{\frac{8kT}{m}}$

3. ✔ $\sqrt{\frac{2kT}{m}}$

4. ✖ $\sqrt{\frac{5kT}{m}}$

Question Number : 134 Question Id : 630680345524 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The change in entropy, ΔS is given by _____. (where Q is the heat , W is the work, U is the energy and T is the temperature)

Options :

1. ✖ $\frac{\Delta W}{T}$

2.

✖ $\frac{\Delta U}{T}$

3. ✔ $\frac{\Delta Q}{T}$

4. ✖ $\frac{\Delta W}{\Delta U}$

Question Number : 135 Question Id : 630680345525 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

If the temperature of the cold body is 280 K and hot body is 420 K then, what will be the efficiency of carnot engine?

Options :

1. ✖ 66.67 percent

2. ✔ 33.33 percent

3. ✖ 56.67 percent

4. ✖ 90.22 percent

Question Number : 136 Question Id : 630680345526 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Change in amount of heat Q given to the gas is equal to the sum of work done W, by it and the change in internal energy U, i.e. $\Delta Q = \Delta U + \Delta W$.

The above statement is the _____ of thermodynamics.

Options :

1. ✖ Zeroth law

2. ✔ First law

3. ✖ Second law

4. ✖ Third law

Question Number : 137 Question Id : 630680345527 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Two rods of same dimensions having thermal resistance R_1 and R_2 when connected in series have an equivalent thermal resistance equal to _____.

Options :

1. ✖ $R_1 - R_2$

2. ✖ $R_2 - R_1$

3. ✔ $R_1 + R_2$

4. ✖ $\frac{R_1 R_2}{R_1 + R_2}$

Question Number : 138 Question Id : 630680345528 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following equation represents Stefan-Boltzman law? (u = the amount of radiation emitted per unit time, A= area of the blackbody emitting radiation, T = temperature of the black body and $\sigma = Stefan's\ constant$)

Options :

1. ✔ $u = \sigma AT^4$

2. ✖ $u = \sigma AT^2$

3. ✖ $u = \sigma AT$

4. ✖ $u = \sigma A\sqrt{T}$

Question Number : 139 Question Id : 630680345529 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A liquid cools from 90°C to 80°C in 10 minutes. Calculate the time taken by the liquid to further cool down by 10°C if the temperature of surrounding is kept constant at 25°C.

Options :

1. ✖ 10 min

2. ✖ 20 min

3. ✖ 18 min

4. ✔ 12 min

Question Number : 140 Question Id : 630680345530 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to ideal gas laws is/are correct?

I. As per the Boyle's law, at the same temperature and pressure, equal volumes of all gases contain equal number of molecules.

II. As per the Charles's law, at a given pressure, the volume of a given mass of a gas is proportional to its absolute temperature.

Options :

1. ✖ Only I

2. ✔ Only II

3. ✖ Both I and II

4. ✖ Neither I nor II

Question Number : 141 Question Id : 630680345531 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to blackbody radiation is/are correct?

I. The measured value of Boltzman constant is $5.67 \times 10^{8}\ \mathrm{Wm^{-2}\,K^{-4}}$

II. The emissivity of black body is zero.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✔ Neither I nor II

Question Number : 142 Question Id : 630680345532 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to blackbody radiation laws is/are correct?

I. The measured value of Wien's constant is 0.288 cm K

II. According to Wien's displacement law, wavelength is inversely proportional to the absolute temperature.

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 143 Question Id : 630680345533 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to specific heat is/are correct?

I. Molar heat capacity at constant pressure is slightly greater than molar heat capacity at constant volume for a solid with a small expansion coefficient.

II. For an ideal gas, $C_p - C_V$ is a universal constant

III. Joly's differential steam calorimeter is used to measure C_V of a gas.

Options :

1. ✖ Only I and II

2. ✖ Only II and III

3. ✖ Only I and III

4. ✔ I, II and III

Question Number : 144 Question Id : 630680345534 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement(s) related to thermodynamic processes is/are correct?

I. In an adiabatic process for an ideal gas, $W = 0$

II. In an isothermal process for an ideal gas, $Q = W$

III. In an isothermal process for an ideal gas, $W = O$

Options :

1. ✔ Only II

2. ✖ Only I and II

3. ✖ Only I and III

4. ✖ I, II and III

Question Number : 145 Question Id : 630680345535 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following pairs related to thermodynamic processes

	Process		Constant Quantity
I	Isothermal	1	Volume
II	Isobaric	2	Pressure
III	Isochoric	3	Temperature

Options :

1. ✖ I-1, II-2, III-3

2. ✖ I-2, II-3, III-1

3. ✔ I-3, II-2, III-1

4. ✖ I-1, II-3, III-2

Question Number : 146 Question Id : 630680345536 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is/are correct pair(s) for work done in a process?

I. Isothermal – $nRT \ln(V_2/V_1)$

II. Isobaric – $p(V_2 - V_1)$

Options :

1. ✖ Only I

2. ✖ Only II

3. ✔ Both I and II

4. ✖ Neither I nor II

Question Number : 147 Question Id : 630680345537 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is/are correct pair(s) for process's related to molar heat capacity?

I. Isothermal – Zero

II. Adiabatic – Infinity

Options :

1. ✖ Only I

2. ✖ Only II

3. ✖ Both I and II

4. ✔ Neither I nor II

Question Number : 148 Question Id : 630680345538 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following in increasing order of their specific heat capacities.

I. Lead

II. Water

III. Ice

Options :

1. ✔ I, III, II

2. ✖ III, II, I

3. ✖ III, I, II

4. ✖ II, III, I

Question Number : 149 Question Id : 630680345539 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following laws according to the years (first to last) in which they were discovered.

I. Gay-Lussac law

II. Boyle's law

III. Charles law

Options :

1. ✖ I, II, III

2. ✔ II, III, I

3. ✖ II, I, III

4. ✖ I, III, II

Question Number : 150 Question Id : 630680345540 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following scientists according to the years (first to last) in which they have given their theories.

I. Francis Bacon

II. Lord Kelvin

III. William Thomson

Options :

1. ✔ I, III, II

2. ✖ I, II, III

3. ✖ II, I, III

4. ✖ II, III, I