Exported On *	2023/11/06 9:59:09
Title *	Question Paper Answer Key
OES Exam *	GPSC05202337 / Lecturer in Physics / Completed / 2023-11-05

1

Question Description	The value of commutation bracket $\left[\hat{x}, \widehat{p_x}\, e^{-\widehat{p_x}}\right]$ is: (A) $i\hbar$ (B) 0 (C) $i\hbar(1 + \widehat{p_x})e^{-\widehat{p_x}}$ (D) $i\hbar(1 - \widehat{p_x})e^{-\widehat{p_x}}$
A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	D
Marks	1

2

Question Description	Two bodies of mass m and 3m are connected by a massless rigid rod of length l lying in the xy-plane with the centre of the rod at the origin. If this system is rotating about the z-axis with a frequency ω, its angular momentum is (A) $2ml^2\omega$ (B) $\frac{ml^2\omega}{2}$ (C) $ml^2\omega$ (D) $\frac{ml^2\omega}{4}$
A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	C
Marks	1

3	**Question Description**	In a rigid rotator of mass M, if the energy of the first excited state is 1 meV, then what is the energy of the fourth excited state (in meV)?
	A	5
	B	10
	C	15
	D	20
	E	None of the above
	Correct Answer	B
	Marks	1

4	Question Description	If ψ_{nlm} denotes the eigenfunction of the Hamiltonian with a potential $V = V(r)$ then the expectation value of the operator $L_x^2 + L_y^2$ in the state $\psi = 4\psi_{211} + \sqrt{10}\psi_{210} - \sqrt{10}\psi_{21-1}$ is:

(A) $\frac{25}{18}\hbar^2$

(B) $\frac{45}{36}\hbar^2$

(C) $\frac{23}{18}\hbar^2$

(D) $\frac{29}{18}\hbar^2$

A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	C
Marks	1

5	Question Description	According to the nuclear shell model, the respective ground state spin-parity values of O_8^{15} and O_8^{17} nuclei are
		a. $\frac{3}{2}^-, \frac{1}{2}^-$
		b. $\frac{3}{2}^+, \frac{5}{2}^-$
		c. $\frac{1}{2}^-, \frac{5}{2}^+$
		d. $\frac{1}{2}^+, \frac{1}{2}^-$
A	a	
B	b	
C	c	
D	d	
E	None of the above	
Correct Answer	C	
Marks	1	

6	Question Description	A parallel plate capacitor with square plates of side 2m separated by $1\mu m$ is filled with a medium of dielectric constant of 5. If the charges on the two plates are 2C and -2C, the voltage across the capacitor is (in kv, up to two decimal places, $\varepsilon_0 = 8.85 \times 10^{-12} F/m$)
	A	22.19
	B	12.22
	C	11.29
	D	19.19
	E	None of the above
	Correct Answer	C
	Marks	1

7	Question Description	The ground state wavefunction of potential $V(x) = -V_0 \delta(x)$ is $\psi(x) = Ae^{-a|x|}$. It is subjected to perturbation $H' = bx^2$ then find first order correction in energy.
		(A) 0
		(B) $\frac{b}{a^2}$
		(C) $\frac{b}{2a^2}$
		(D) $\frac{b^2}{a}$
	A	A
	B	B
	C	C
	D	D
	E	None of the above
	Correct Answer	C
	Marks	1

8	**Question Description**	An infinitely long thin cylindrical shell has its axis coinciding with z-axis. It carries a surface charge density $2\sigma_0 cos\phi$, where ϕ is the polar and is a constant. The magnitude of the electric field inside the cylinder is
		(A) 0
		(B) $\frac{\sigma_0}{\varepsilon_0}$
		(C) $\frac{\sigma_0}{2\varepsilon_0}$
		(D) $\frac{3\sigma_0}{4\varepsilon_0}$
	A	A
	B	B
	C	C
	D	D
	E	None of the above
	Correct Answer	B
	Marks	1

9	Question Description	
		For the function $f(z) = \frac{z - \sin z}{z^3}$ the point $z = 0$ is a. a removable singularity b. an essential singularity c. a pole of order 2 d. a pole of order 3
	A	a
	B	b
	C	c
	D	d
	E	None of the above
	Correct Answer	A
	Marks	1

10

Question Description	Given the matrix $A = \frac{1}{3}\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$ what is the value of et (e^A) ? A) $e^{\frac{1}{3}}$ B) e C) e^2 D) e^3
A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	B
Marks	1

11	Question Description	An op-amp amplifier has a gain of 10 in the inverting configuration and a band width of 1 MHz At what gain will it have a bandwidth of 10 MHz?
	A	1
	B	20
	C	100
	D	10^5
	E	None of the above
	Correct Answer	C
	Marks	1

12	Question Description	A perfectly conducting fluid permittivity ε and permeability μ flows with a uniform velocity $\vec{v}$ in the presence of time dependent electric and magnetic fields $\vec{E}$ and $\vec{B}$, respectively, if there is a finite current density in the fluid, then

(A) $\vec{\nabla} \times (\vec{v} \times \vec{B}) = \frac{\partial \vec{B}}{\partial t}$

(B) $\vec{\nabla} \times (\vec{v} \times \vec{B}) = -\frac{\partial \vec{B}}{\partial t}$

(C) $\vec{\nabla} \times (\vec{v} \times \vec{B}) = \sqrt{\mu\varepsilon}\frac{\partial \vec{E}}{\partial t}$

(D) $\vec{\nabla} \times (\vec{v} \times \vec{B}) = -\sqrt{\mu\varepsilon}\frac{\partial \vec{E}}{\partial t}$

A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	A
Marks	1

13	Question Description	The mass defect of an atom divided by its mass number is known as
	A	Binding energy
	B	Packing fraction
	C	Asymmetric energy
	D	Surface energy
	E	None of the above
	Correct Answer	B
	Marks	1

14	Question Description	
		Which one of the following operators is Hermitian?
		a. $i\left(\dfrac{p_x x^2 - x^2 p_x}{2}\right)$
		b. $i\left(\dfrac{p_x x^2 + x^2 p_x}{2}\right)$
		c. $e^{ip_x a}$
		d. $e^{-ip_x a}$
A	a	
B	b	
C	c	
D	d	
E	None of the above	
Correct Answer	A	
Marks	1	

15 **Question Description**	A particle moves in a potential $V = x^2 + y^2 + \frac{z^2}{2}$, which component(s) of the angular momentum is/are constant(s) of motion? (A) Only L_z (B) None (C) Only L_x and L_z (D) L_x, L_y, and L_z
A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	A
Marks	1

16

Question Description	
	A spaceship is moving away from observer B on Earth at a velocity 0.6c along +ve x-direction. The spaceship has a gun shooting the particle of rest mass m_0 at a velocity of 0.8c along the +ve x-direction relative to the spaceship. The kinetic energy of the particle measured by the observer B on Earth is a. $\frac{2}{3}m_0c^2$ b. $\frac{3}{2}m_0c^2$ c. $\frac{12}{25}m_0c^2$ d. $\frac{25}{12}m_0c^2$
A	a
B	b
C	c
D	d
E	None of the above
Correct Answer	D
Marks	1

17

Question Description	

The value of the electric and magnetic fields in a particular reference frame (in suitable units) are

$$\mathbf{E} = 2\hat{i} + \hat{j} + 2\hat{k}, \quad \mathbf{B} = \sqrt{\tfrac{71}{32}}\,\hat{i} + \tfrac{3}{4}\hat{j} - \sqrt{\tfrac{71}{32}}\,\hat{k}$$

In another inertial frame, which moves at a constant velocity with respect to the first frame, the electric field and magnetic field consistent with the previous observations are

a. $\mathbf{E'} = 3\hat{i} + 5\hat{j} + \sqrt{71}\hat{k}$, $\mathbf{B'} = 4\hat{i} + \tfrac{3}{2}\hat{j}$

b. $\mathbf{E'} = \sqrt{3}\hat{i} + \sqrt{\tfrac{33}{4}}\hat{j}$, $\mathbf{B'} = \sqrt{\tfrac{3}{16}}\hat{i} + \sqrt{\tfrac{113}{16}}\hat{k}$

c. $\mathbf{E'} = \sqrt{\tfrac{71}{32}}\hat{i} + \tfrac{3}{4}\hat{j} - \sqrt{\tfrac{71}{32}}\hat{k}$, $\mathbf{B'} = 2\hat{i} + \hat{j} + 2\hat{k}$

d. $\mathbf{E'} = \hat{i} + \hat{j} + \tfrac{3}{4}\hat{k}$, $\mathbf{B'} = 4\hat{i} - 4\hat{j} + \hat{k}$

A	a
B	b
C	c
D	d
E	None of the above
Correct Answer	B
Marks	1

18	**Question Description**	Rest mass of a particle is m_0. If it moves with speed of light C, its mass tends to A) m_o B) Zero C) ∞ D) $m_0/2$
	A	A
	B	B
	C	C
	D	D
	E	None of the above
	Correct Answer	C
	Marks	1

19	Question Description	
		A body of mass m moves in a circular orbit of radius R in a potential $V_{(r)} = -\frac{K}{r}$, where K is a constant. The orbital angular momentum about the centre of circle is A) $2\,RKm$ B) $\sqrt{2\,RKm}$ C) $\sqrt{RKm}$ D) RKm
	A	A
	B	B
	C	C
	D	D
	E	None of the above
	Correct Answer	C
	Marks	1

20	Question Description	The number of independent components of the anti-symmetric tensor A_{ij} with indices $i, j = 1, 2, 3, 4, 5, 6$ is
	A	1
	B	15
	C	21
	D	36
	E	None of the above
	Correct Answer	B
	Marks	1

21	Question Description	Among electric field ($\vec{E}$), magnetic field ($\vec{B}$) angular momentum ($\vec{L}$) and vector potential ($\vec{A}$), which is/are odd under parity (space inversion) operation? (A) $\vec{E}$ and $\vec{A}$ only (B) $\vec{E}$ and $\vec{B}$ only (C) $\vec{B}$ and $\vec{L}$ only (D) $\vec{E}$ only
	A	A
	B	B
	C	C
	D	D
	E	None of the above
	Correct Answer	A
	Marks	1

22 **Question Description**	The space-time dependence of the electric field of a linearly polarized light in free space is given by $\hat{x}E_0\cos(\omega t - kz)$ where E_0, ω and k are the amplitude, the angular frequency and the wavevector, respectively. The time average energy density associated with the electric field is (A) $\varepsilon_0 E_0^2$ (B) $\frac{1}{2}\varepsilon_0 E_0^2$ (C) $\frac{1}{4}\varepsilon_0 E_0^2$ (D) $2\varepsilon_0 E_0^2$
A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	C
Marks	1

23

Question Description	The acceleration due to the gravity (g) above the surface of the Earth at height h is approximately 8 times that on above the surface of Mars at height $\frac{h}{2}$. Given that the radius of Mars is about one half the radius of Earth, the ratio of the escape velocity on Earth to that on Mars is approximately (A) 2 (B) 4 (C) $\frac{1}{2}$ (D) $\frac{1}{4}$
A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	B
Marks	1

24 | **Question Description**

The Lagrangian for a system is given by

$$L = \frac{1}{2}ml^2\left(\frac{d\theta}{dt}\right)^2 - mgl\cos\theta$$

The Poisson bracket between θ and $\frac{d\theta}{dt}$ is

a. $\frac{1}{ml^2}$

b. $\frac{g}{l}$

c. $\frac{1}{m}$

d. 1

A	a
B	b
C	c
D	d
E	None of the above
Correct Answer	A
Marks	1

25	Question Description	
		The probability that an energy level ϵ at temperature T is unoccupied by a fermion of chemical potential μ is given by
		a. $\dfrac{1}{exp\left(\frac{\epsilon-\mu}{k_BT}\right)+1}$
		b. $\dfrac{1}{exp\left(\frac{\epsilon-\mu}{k_BT}\right)-1}$
		c. $\dfrac{1}{exp\left(\frac{\mu-\epsilon}{k_BT}\right)+1}$
		d. $\dfrac{1}{exp\left(\frac{\mu-\epsilon}{k_BT}\right)-1}$
A		a
B		b
C		c
D		d
E		None of the above
Correct Answer		C
Marks		1

26	Question Description	

If L_x, L_y and L_z are respectively the x, y and z components of angular momentum operator L.

The commutator $[L_x^2, L_z]$ is equal to (in units of $i\hbar$)

a. $L_x^2 + L_y^2$

b. $L_x L_y + L_y L_x$

c. $L_x^2 - L_y^2$

d. $-(L_x L_y + L_y L_x)$

A	a
B	b
C	c
D	d
E	None of the above
Correct Answer	D
Marks	1

27	Question Description	
		Which one of the following three-quark states (qqq) denoted by X can not be a possible baryon? The corresponding electric charge is indicated in the superscript. a. X^- b. X^{--} c. X^+ d. X^{++}
	A	a
	B	b
	C	c
	D	d
	E	None of the above
	Correct Answer	B
	Marks	1

28	**Question Description**	In an interference pattern formed by two coherent sources, the maximum and minimum intensities are $49I_0$ and $9I_0$ respectively. The individual intensities of the wave are
		(A) $9I_0$ and $7I_0$
		(B) $7I_0$ and $5I_0$
		(C) $5I_0$ and $2I_0$
		(D) $25I_0$ and $4I_0$
	A	A
	B	B
	C	C
	D	D
	E	None of the above
	Correct Answer	D
	Marks	1

29	**Question Description**	An electron is confined in a cubical box of size a. The energy of the fourth excited energy state of the system is
		a. $\dfrac{h^2}{ma^2}$
		b. $\dfrac{3h^2}{ma^2}$
		c. $\dfrac{3h^2}{2ma^2}$
		d. $\dfrac{9h^2}{8ma^2}$
	A	a
	B	b
	C	c
	D	d
	E	None of the above
	Correct Answer	C
	Marks	1

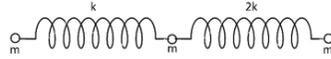|	
30	**Question Description**
	The free energy for a photon gas is given by
	$$F = -\frac{a}{3}VT^4, \quad \text{where a is a constant.}$$
	The entropy S and pressure P of the photon gas are
	a. $S = \frac{4}{3}aVT^3, \; P = \frac{a}{3}T^4$
	b. $S = \frac{1}{3}aVT^4, \; P = \frac{4a}{3}T^3$
	c. $S = \frac{4}{3}aVT^4, \; P = \frac{a}{3}T^3$
	d. $S = \frac{1}{3}aVT^3, \; P = \frac{4a}{3}T^4$
A	a
B	b
C	c
D	d
E	None of the above
Correct Answer	A
Marks	1

31	**Question Description**

Three particles of equal mass (m) are connected by two identical massless springs of stiffness constant K and 2k as shown in figure

If x_1, x_2 and x_3 denote the horizontal displacement of the masses from their respective equilibrium positions the potential energy of the system is

(A) $V = \frac{1}{2}K[x_1^2 + x_2^2 + x_3^2 + 2x_2(x_1 + 2x_3)]$

(B) $V = \frac{1}{2}K[x_1^2 + 3x_2^2 + 2x_3^2]$

(C) $V = \frac{1}{2}K[x_1^2 + x_2^2 + x_3^2 - 2x_2(x_1 + x_3)]$

(D) $V = \frac{1}{2}K[x_1^2 + 3x_2^2 + 2x_3^2 - 2x_2(x_1 + 2x_3)]$

A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	D
Marks	1

32		
Question Description	If a PN junction is formed having a junction potential V_J and depletion region width W, then A) $V_J \propto W$ B) $V_J \propto W^{1/2}$ C) $V_J \propto W^2$ D) $V_J \propto W^{3/2}$	
A	A	
B	B	
C	C	
D	D	
E	None of the above	
Correct Answer	B	
Marks	1	

33	Question Description	The minimum number of NAND gates required to construct an OR gate is
	A	2
	B	3
	C	4
	D	5
	E	None of the above
	Correct Answer	B
	Marks	1

34	Question Description	A ball weighting 100gm, released from a height of 10m, bounces perfectly elastically off a plate. The collision time between the ball and the plate is 0.4s. The average force on the plate is approximately ($g = 9.8$)
	A	7N
	B	5N
	C	3N
	D	9 N
	E	None of the above
	Correct Answer	A
	Marks	1

35	Question Description	The state vector of a one-dimensional simple harmonic oscillator of angular frequency ω, at time $t = 0$, is given by $|\psi(0)\rangle = \frac{1}{\sqrt{2}}|0\rangle + \frac{1}{\sqrt{2}}|1\rangle$ where $|0\rangle$ and $|1\rangle$ are the normalized ground state and the first excited state, respectively. The minimum time t after which the state vector $\psi(t)$ is orthogonal to $\psi(0)$, is
		(A) $\frac{\pi}{2\omega}$
		(B) $\frac{\pi}{\omega}$
		(C) $\frac{2\pi}{\omega}$
		(D) $\frac{\pi}{3\omega}$
A		A
B		B
C		C
D		D
E		None of the above
Correct Answer		B
Marks		1

| 36 | **Question Description** | The energies of two state quantum system E_0 and $E_0 + a\hbar$ where a>0 is constant and $|0\rangle$ and $|1\rangle$ are corresponding state vectors respectively. At t=0, system is in $|0\rangle$. The potential is allowed by time independent term V such that $\langle 1|V|0\rangle = \frac{\hbar a}{10}$. The transition probabiltty at time t<<$\frac{1}{a}$ is: |

(A) $\frac{a^2 t^2}{25}$

(B) $\frac{a^2 t^2}{50}$

(C) $\frac{a^2 t^2}{100}$

(D) $\frac{a^2 t^2}{200}$

A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	C
Marks	1

37	Question Description	

Let $\psi(x)$ be an arbitrary wave function of a physical system and let $\hat{H}$ be Hamiltonian of the system with its lowest eight value denoted by E_0. Then

A) $\dfrac{\langle\psi|\hat{H}|\psi\rangle}{\langle\psi|\psi\rangle} \leq E_0$

B) $\left|\dfrac{\langle\psi|H|\psi\rangle}{\langle\psi|\psi\rangle}\right|^{1/2} \geq E_0$

C) $\dfrac{\sqrt{\langle\psi|H|\psi\rangle}}{\langle\psi|\psi\rangle} \geq E_0$

D) $\dfrac{\langle\psi|H|\psi\rangle}{\langle\psi|\psi\rangle} > E_0$

A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	D
Marks	1

38	**Question Description**	The voltage resolution of a 12-bit digital-to-analog converter (DAC), whose output varies from -10 V to 10 V is, approximately
	A	100 mV
	B	20 mV
	C	5 mV
	D	1 mV
	E	None of the above
	Correct Answer	C
	Marks	1

39

Question Description

The lattice parameters a, b, c of an orthorhombic crystal are related by $a = 2b = 3c$. In units of a, what is the interplanar separation between the (110) planes?

a. $\sqrt{\frac{1}{2}}$

b. $\sqrt{\frac{1}{3}}$

c. $\sqrt{\frac{1}{4}}$

d. $\sqrt{\frac{1}{5}}$

A	a
B	b
C	c
D	d
E	None of the above
Correct Answer	D
Marks	1

40	Question Description	Madelung energy is calculated in
	A	Inert gas crystals
	B	Covalent crystals
	C	Hydrogen banded crystals
	D	Ionic crystals
	E	None of the above
	Correct Answer	D
	Marks	1

41	Question Description	The number of independent components of a real antisymmetric tensor of rank two in 4 dimension is
	A	4
	B	6
	C	8
	D	10
	E	None of the above
	Correct Answer	B
	Marks	1

42

Question Description

Consider three polarizers P_1, P_2 and P_3 placed along an axis as shown below:
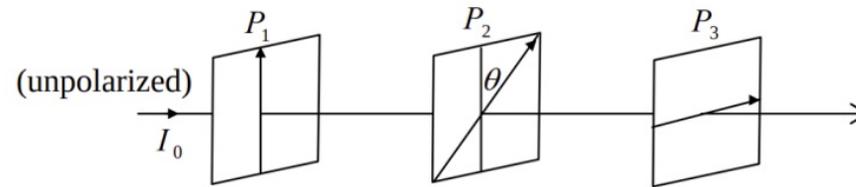
The pass axis of P_1 and P_3 are at right angles to each other while the pass axis of P_2 makes an angle θ with that of P_1. A beam of unpolarized light of intensity I_0 is incident on P_1 as shown. The intensity of light emerging from P_3 is

a. 0

b. $\dfrac{I_0}{2}$

c. $\dfrac{I_0}{8}\sin^2(2\theta)$

d. $\dfrac{I_0}{4}\sin^2(2\theta)$

A	a
B	b
C	c
D	d
E	None of the above
Correct Answer	C
Marks	1

43	Question Description
	Consider a set of particles which interact by a pair potential $V(r) = ar^{\frac{2}{3}}$ where r is the inter particle separation and a>0 is a constant. If a system of such particles has reached virial equilibrium, the ratio of the kinetic to the total energy of the system is (A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) $\frac{2}{3}$ (D) $\frac{3}{2}$
A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	B
Marks	1

44	Question Description	The order of magnitude of the energy band gap of a typical semiconductor is
	A	1 MeV
	B	1 keV
	C	1 eV
	D	1 meV
	E	None of the above
	Correct Answer	C
	Marks	1

45	**Question Description**	A weighted resistor network is used as a 4 bit D/A converter. If the current through the LSB resistor is $10\mu A$. What is the maximum current through the MSB resistor? A) 40 μA B) 2.5 μA C) 160 μA D) 80 μA
	A	A
	B	B
	C	C
	D	D
	E	None of the above
	Correct Answer	D
	Marks	1

46

Question Description	If the matrix A is given by $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$. Then find the value of e^{2A}. (A) $I + \left(\frac{e^3-1}{3}\right)A$ (B) $I + \left(\frac{e^6-1}{3}\right)A$ (C) $I + \left(\frac{e^3+1}{3}\right)A$ (D) $I + \left(\frac{e^6+1}{3}\right)A$
A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	B
Marks	1

47

Question Description	
	The energy dependence of the density of states for a two-dimensional non-relativistic electron gas is given by $g(E) = CE^n$, where C is constant. The value of n is a. 0 b. $-\frac{1}{2}$ c. $\frac{1}{2}$ d. 1
A	a
B	b
C	c
D	d
E	None of the above
Correct Answer	A
Marks	1

48

Question Description	Solve the differential equation: $(1 + x^2)\frac{dy}{dx} + 2xy = 4x^2$
	(A) $y = \frac{1}{(1+x^2)}\left(\frac{4x^3}{3} + C\right)$
	(B) $y = \left(\frac{4x^3}{3(1+x^2)} + C\right)$
	(C) $y = (1 + x^2)\left(\frac{4x^3}{3} + C\right)$
	(D) $y = \left(\frac{4x^3(1+x^2)}{3} + C\right)$
A	A
B	B
C	C
D	D
E	None of the above
Correct Answer	A
Marks	1

49	Question Description	A constant force F is applied to a relativistic particle of rest mass m. If the particle starts from rest at $t=0$, its speed after $\frac{t}{2}$ is
		(A) $\dfrac{Ftc}{\sqrt{m^2c^2+2F^2t^2}}$
		(B) $\dfrac{1}{\sqrt{4m^2c^2+F^2t^2}}$
		(C) $\dfrac{Ftc}{\sqrt{4m^2c^2+F^2t^2}}$
		(D) $\dfrac{4Ftc}{\sqrt{4m^2c^2+F^2t^2}}$
A	A	
B	B	
C	C	
D	D	
E	None of the above	
Correct Answer	C	
Marks	1	

50	Question Description	Identify which one is a first-order phase transition.
	A	A paramagnetic to ferromagnetic transition in the absence of a magnetic field.
	B	A liquid to gas transition close to its triple point.
	C	A metal to superconductor transition in the absence of a magnetic field.
	D	A liquid to gas transition at its critical temperature.
	E	None of the above
	Correct Answer	B
	Marks	1

51	Comprehension	Read the following passage and answer the Questions below:
		We are men of science and we realize that the whole structure of society rests on habit. With the new organization must therefore grow the new habit that is to support it. To precipitate organic change is merely to court reaction. That is the lesson of all revolutions; and it is one which English socialists, at any rate, have learnt. We think, moreover, that capitalist society is, by its own momentum, travelling towards the goal which we desire.
	Question Description	From the tone and tenor of the above passage, the speaker appears to be
	A	a non-capitalist
	B	a man of science
	C	an English socialist
	D	a sociologist
	E	None of the above
	Correct Answer	C
	Marks	1

52	Comprehension	Read the following passage and answer the Questions below: We are men of science and we realize that the whole structure of society rests on habit. With the new organization must therefore grow the new habit that is to support it. To precipitate organic change is merely to court reaction. That is the lesson of all revolutions; and it is one which English socialists, at any rate, have learnt. We think, moreover, that capitalist society is, by its own momentum, travelling towards the goal which we desire.
	Question Description	It can be surmised from the passage that the phrase "the goal that we desire" implies
	A	disintegration
	B	precipitation
	C	culmination
	D	defeat
	E	None of the above
	Correct Answer	A
	Marks	1

53	**Comprehension**	Read the following passage and answer the Questions below: We are men of science and we realize that the whole structure of society rests on habit. With the new organization must therefore grow the new habit that is to support it. To precipitate organic change is merely to court reaction. That is the lesson of all revolutions; and it is one which English socialists, at any rate, have learnt. We think, moreover, that capitalist society is, by its own momentum, travelling towards the goal which we desire.
	Question Description	"To precipitate organic change is merely to court reaction". This statement implies that
	A	Compulsory change leads to chemical response
	B	Forcefully altering things will causes chemical response
	C	Hastening change calls for a sharp political response
	D	Sudden social change only draws an undesirable response
	E	None of the above
	Correct Answer	D
	Marks	1

54	Comprehension	Read the following passage and answer the Questions below:
		We are men of science and we realize that the whole structure of society rests on habit. With the new organization must therefore grow the new habit that is to support it. To precipitate organic change is merely to court reaction. That is the lesson of all revolutions; and it is one which English socialists, at any rate, have learnt. We think, moreover, that capitalist society is, by its own momentum, travelling towards the goal which we desire.
	Question Description	Identify form the options given below, the one which is opposite in meaning to "momentum"
	A	energy
	B	lethargy
	C	impetus
	D	stimulus
	E	None of the above
	Correct Answer	B
	Marks	1

55	Comprehension	Read the following passage and answer the Questions below:
		We are men of science and we realize that the whole structure of society rests on habit. With the new organization must therefore grow the new habit that is to support it. To precipitate organic change is merely to court reaction. That is the lesson of all revolutions; and it is one which English socialists, at any rate, have learnt. We think, moreover, that capitalist society is, by its own momentum, travelling towards the goal which we desire.
	Question Description	From the options provided below, identify the meaning of the term "revolution" that is unsuited to the passage above
	A	revolt
	B	rebellion
	C	rotation
	D	uprising
	E	None of the above
	Correct Answer	C
	Marks	1

56	Question Description	Which Indian state has approved the formation of a Special Tiger Protection Force?
	A	Arunachal Pradesh
	B	Assam
	C	Nagaland
	D	Sikkim
	E	None of the above
	Correct Answer	A
	Marks	1

57	Question Description	Which state in India has recently implemented an e-cabinet system?
	A	Uttarakhand
	B	Uttar Pradesh
	C	Tripura
	D	Arunachal Pradesh
	E	None of the above
	Correct Answer	C
	Marks	1

58	Question Description	Which of the following police stations is the first women police station in India to be ISO certified?
	A	Bhopal Mahila Thana, Madhya Pradesh
	B	Arwal Women's Police Station, Bihar
	C	Aska Police Station, Odisha
	D	Mahila Thana, Mumbai
	E	None of the above
	Correct Answer	A
	Marks	1

59	Question Description	Who broke the world record in the javelin throw in the F64 category at the 2023 Asian Para Games?
	A	Devendra Jhajharia
	B	Sundar Singh Gurjar
	C	Praveen Kumar
	D	Sumit Antil
	E	None of the above
	Correct Answer	D
	Marks	1

60	Question Description	Which organization has partnered with ISRO for the "Space on Wheels" exhibition?
	A	Indian Institute of Science (IISc)
	B	National Aeronautics and Space Administration (NASA)
	C	Vijnana Bharati (VIBHA)
	D	Atal Innovation Mission (AIM)
	E	None of the above
	Correct Answer	C
	Marks	1

61	Question Description	Which Indian bowler became the first Indian bowler to pick two five-wicket hauls in ICC ODI World Cups?
	A	Jasprit Bumrah
	B	Ravindra Jadeja
	C	Mohammed Siraj
	D	Mohammed Shami
	E	None of the above
	Correct Answer	D
	Marks	1

62	Question Description	When is World Cotton Day celebrated?
	A	October 9th
	B	October 8th
	C	October 7th
	D	October 5th
	E	None of the above
	Correct Answer	C
	Marks	1

63	Question Description	On what date is National Police Commemoration Day observed in India?
	A	20 October
	B	22 October
	C	21 October
	D	23 October
	E	None of the above
	Correct Answer	C
	Marks	1

64	Question Description	Which country participated in the joint army exercise Harimau Shakti with India in October 2023?
	A	Malaysia
	B	Singapore
	C	Indonesia
	D	Bangladesh
	E	None of the above
	Correct Answer	A
	Marks	1

65	Question Description	Where was the 19-foot tall statue of Dr. B.R. Ambedkar, the principal architect of India's Constitution, unveiled outside India?
	A	New York
	B	Washington
	C	Florida
	D	California
	E	None of the above
	Correct Answer	B
	Marks	1

66	Question Description	The price of an petroleum product increases by 25% every odd year and reduces by 20% every even year. By how much percentage, the prices would have risen or fallen after exactly 8 years?
	A	price would increase by 15%
	B	price would increase by 5%
	C	price would decrease by 5%
	D	price would remain same
	E	None of the above
	Correct Answer	D
	Marks	1

67	Question Description	Raju walks 20 m to west, turns left and walks 20 m and turns left and walks 20 m and again turns left and walks 20 m. Which is the direction he is facing now?
	A	north
	B	south
	C	east
	D	west
	E	None of the above
	Correct Answer	A
	Marks	1

68	Question Description	New Jerseys are bought for players. If 6 jerseys are given for each player, one player will get only 4 jerseys. Also, if 4 jerseys are given for each player, 30 jerseys will be remaining. How many Jerseys are bought and how many players are there?
	A	90 jerseys, 16 players
	B	94 jerseys, 16 players
	C	90 jerseys, 15 players
	D	94 jerseys, 14 players
	E	None of the above
	Correct Answer	B
	Marks	1

69	Question Description	In a company employees and managers are in a ratio 7:3. 70% of the employees and 30% of the managers take lunch in the canteen. What percentage of total workforce take lunch in the canteen?
	A	42%
	B	60%
	C	55%
	D	58%
	E	None of the above
	Correct Answer	D
	Marks	1

Question Description	Apply the logic of first two sets of numbers to find the missing number in the third set 25 (144) 49 , 64 (196) 36 , 4 (?) 81
A	100
B	121
C	169
D	129
E	None of the above
Correct Answer	B
Marks	1

Question Description	Jonathan drives to the stadium for watching a football final. At 6.05 pm, one fifth of the way to the stadium, he passes a church. At 6.15 pm, one third of the way to the stadium, he passes a poultry farm. At what time does he reach the stadium?
A	6.45 pm
B	7.00 pm
C	7.05 pm
D	7.10 pm
E	None of the above
Correct Answer	C
Marks	1

72	**Question Description**	Capture the pattern in the first series to form the second series in the same order, starting with the given number. Which number will come in place of D Series I: 5 8 14 26 50 Series II: 7 A B C D
	A	94
	B	82
	C	100
	D	102
	E	None of the above
	Correct Answer	B
	Marks	1

73	**Question Description**	J * K means that J is the mother of K, J + K means that J is the father of K, J − K means J is the sister of K. On the basis of this information, select the option which shows that L is the grandfather of K
		a. L + J + M − K
		b. L * M + N − K
		c. L + N − K
		d. L + M − N - K
	A	a
	B	b
	C	c
	D	d
	E	None of the above
	Correct Answer	A
	Marks	1

74	Question Description	At the birthday party, people were asked to guess the number of balloons used for stage decoration. No guess was correct, but the nearest guesses were 171, 177, 186 and 190. The correct number of balloons was one, three, ten and sixteen units from the guesses. How many balloons were used?
	A	178
	B	191
	C	187
	D	197
	E	None of the above
	Correct Answer	C
	Marks	1

75	Question Description	Find the odd term from given alternatives.
	A	APO
	B	AOU
	C	IOE
	D	EIU
	E	None of the above
	Correct Answer	A
	Marks	1