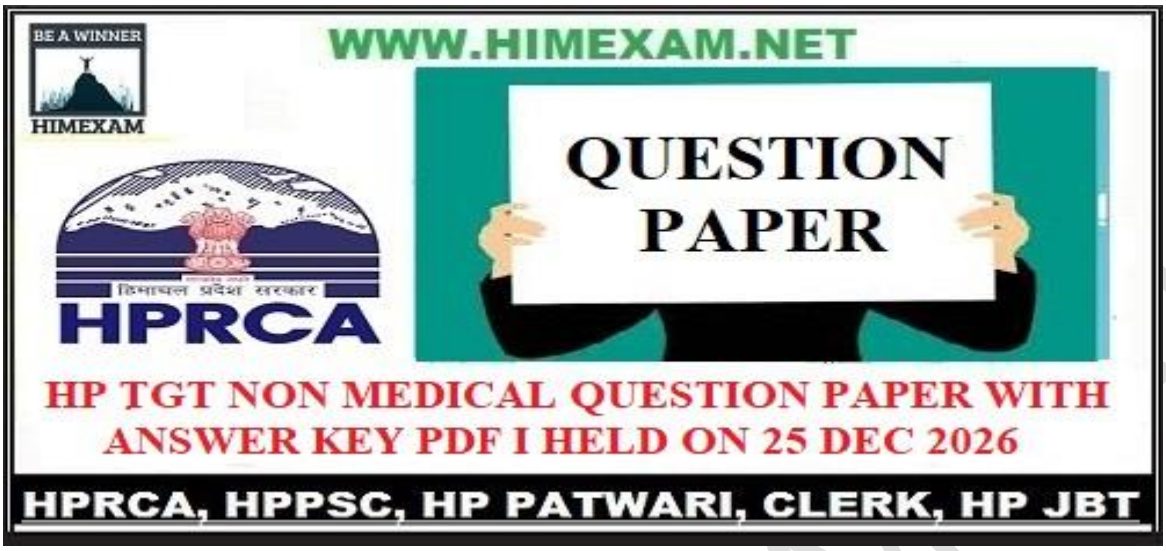
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HIMACHAL PRADESH RAJYA CHAYAN AYOG

Recruitment for the Post of Trained Graduate Teacher NON MEDICAL December 2025

HP Trained Graduate Teacher (NON MEDICAL) Question Paper with Answer Key held on 25 December 2025

Shift 03:30 PM – 5:30 PM

Govt of Himachal Pradesh
Himachal Pradesh Rajya Chayan Aayog
हिमाचल प्रदेश राज्य चयन आयोग

Assessment Name	Recruitment for the post of Trained Graduate Teacher Non Medical 25th to 27th Dec 2025
Exam Date	25/12/2025
Shift	3:30 PM - 5:30 PM

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Section : **Trained Graduate Teacher Non Medical**

Q.1	**A copolymer is most accurately defined as:**
Ans	✗ A. Homopolymer derived from repetitive single unit reaction
	✗ B. Polymer composed solely of one structural repeating unit
	✗ C. Polymer made by condensation of identical monomers
	✓ D. Polymer formed from two or more different monomers

Q.2	**A culturally responsive art curriculum should primarily aim to:**
Ans	✗ A. Avoid the inclusion of diverse community art practices
	✗ B. Replace local arts with standardized global templates
	✗ C. Focus only on Western artistic traditions and techniques
	✓ D. Represent multiple cultural narratives in creative tasks

Q.3	**Refer to the following letter series and answer the question.Counting to be done from left to right only.** **(Left) M B O N H M K A U B Q A R Z S W U Y E A S H (Right)** **How many such consonants are there each of which is immediately preceded by a consonant and also immediately followed by a vowel?**
Ans	✓ A. 4
	✗ B. 5
	✗ C. 3
	✗ D. 6

Q.4	**What does the concept "Language Across the Curriculum" primarily emphasize?**
Ans	✗ A. Language learning should occur only in language classes
	✗ B. Only language teachers are responsible for teaching language skills
	✓ C. Language learning occurs through all subjects as a medium of learning
	✗ D. Language is confined to grammar lessons only

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Q.5	**When generating microstates in a Monte Carlo (MC) simulation, the technique used to bias the sampling toward regions representative of the equilibrium ensemble is called _____.**
Ans	✗ A. Detailed balancing
	✓ B. Importance sampling
	✗ C. Cluster expansion
	✗ D. Random walking

Q.6	**The atomic mass of a metal having specific heat capacity of 0.1344 J K^{-1} g^{-1} is _____.**
Ans	✓ A. 185.5 g/mol
	✗ B. 47.62 g/mol
	✗ C. 840 g/mol
	✗ D. 100 g/mol

Q.7	Let $T:R^3 \rightarrow R^3$ be defined by $T(v) = 0$ for all v. What are its eigenvalues?
Ans	✗ A. All real numbers
	✓ B. Only 0
	✗ C. 0 and 1
	✗ D. Only 1

Q.8	**In a thermodynamic system, which of the following expresses the correct relation between the Helmholtz free energy F and the internal energy U? (P, V, T, S, G, and H are thermodynamic variables)**
Ans	✓ A. F = U − TS
	✗ B. F = H − TS
	✗ C. F = TS − PV
	✗ D. F = G + TS

Q.9	**A reversible isothermal expansion of an ideal gas from volume V_1 to V_2 at temperature T does what total work?**

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Ans	✗ A. $w=nRT\ln(V_1/V_2)$
	✗ B. $w=-nR\Delta T$
	✗ C. $w=-P\Delta V$
	✓ D. $w=-nRT\ln(V_2/V_1)$

Q.10	**The planting of 'shelter belts' (rows of trees) serves as a mitigation measure against which specific hazard?**
Ans	✓ A. Wind erosion in agricultural and arid areas.
	✗ B. Noise pollution in urban areas.
	✗ C. Water pollution from industries.
	✗ D. River bank erosion during floods.

Q.11	Let A be an $n \times n$ matrix. If $A^2 = I$, then which one of the following statements is correct?
Ans	✗ A. All the Eigen values of A are only 1
	✓ B. Eigen Values of A are only $\pm$
	✗ C. A must be the identity matrix
	✗ D. Eigen values of A are ± 2

Q.12	**In a certain code language, 'BLOS' is coded as '5432' and 'SLOT' is coded as '5824'. What is the code for 'T' in the given code language?**
Ans	✗ A. 5
	✓ B. 8
	✗ C. 2
	✗ D. 4

Q.13	**If an analytic function over the set of all complex numbers does not take two values from the set of complex numbers, then function must be**

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Ans	✗ A. polynomial
	✗ B. zero
	✗ C. transcendental
	✓ D. constant

Q.14	**Which of the following hill stations of Himachal Pradesh is situated on the Kalka–Shimla UNESCO World Heritage narrow-gauge railway line and also serves as the state capital?**
Ans	✓ A. Shimla
	✗ B. Dalhousie
	✗ C. Dharamshala
	✗ D. Manali

Q.15	**When you walk around your house and reach the exact spot you started from, your displacement becomes _____.**
Ans	✗ A. Distance = Displacement
	✗ B. Distance < Displacement
	✓ C. Displacement = 0
	✗ D. Distance > Displacement

Q.16	**Quantitative analysis is primarily concerned with:**
Ans	✗ A. Measuring the size and shape of crystals formed
	✗ B. Describing only the physical appearance of solids
	✓ C. Determining the amount of substance present
	✗ D. Identifying the color of a chemical compound

Q.17	**Which of the following is listed as one of the four agro-climatic zones of Himachal Pradesh?**

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Ans	✔ A. Cold Dry Zone
	✘ B. Deccan Plateau Zone
	✘ C. Southern Plateau Zone
	✘ D. Coastal Plains Zone

Q.18	**For an enhancement-type MOSFET, the input impedance is:**
Ans	✔ A. Extremely high because gate is insulated by oxide
	✘ B. Very low due to majority carriers
	✘ C. Dependent only on drain voltage
	✘ D. Low due to body resistance

Q.19	**The Normal Zeeman effect occurs when:**
Ans	✘ A. Orbital angular momentum L = 0
	✘ B. Magnetic field is absent
	✘ C. Total spin S = 1/2
	✔ D. Total spin S = 0

Q.20	**Select the most appropriate option to fill in the blank.** **After the long hike, the campers were feeling extremely _____.**
Ans	✔ A. energetic
	✘ B. energize
	✘ C. energy
	✘ D. energizing

Q.21	**Which Japanese Coast Guard ship arrived at Chennai Port on 7 July 2025?**
Ans	✘ A. Shikishima

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	✗ B. Akitsushima
	✗ C. Mizuho
	✓ D. Itsukushima

Q.22	**Which process has ΔS < 0?**
Ans	✗ A. Solid subliming
	✓ B. Water vapor condensing
	✗ C. Ice melting
	✗ D. Gas expansion

Q.23	**Which structure in a flowering plant develops into a seed after fertilization?**
Ans	✗ A. Anther
	✓ B. Ovule
	✗ C. Stigma
	✗ D. Petal

Q.24	**Spin–orbit coupling shows its maximum strength in which type of atoms?**
Ans	✗ A. Independent of atomic number
	✗ B. Strong in light atoms, weak in heavy atoms
	✓ C. Strong in heavy atoms, weak in light atoms
	✗ D. Strong for all atoms equally

Q.25	**Inside a parallel-plate capacitor being charged by a time-dependent current, the magnetic field at a radius r<R is given by** $B_\phi(r,t) = \frac{\mu_o r}{2\pi R^2} I(t)$ **The magnitude of the Poynting vector at radius r ≤ R is:**

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Ans	✗ A. $2\varepsilon_o rE(t)\frac{dE}{dt}$
	✗ B. $\frac{r}{2\varepsilon_o}E(t)\frac{dE}{dt}$
	✓ C. $\frac{\varepsilon_o r}{2}E(t)\frac{dE}{dt}$
	✗ D. $\frac{2r}{\varepsilon_o}E(t)\frac{dE}{dt}$

Q.26	**Which of the following statements best distinguishes the primary purpose of Assessment for Learning (AfL) from Assessment of Learning (AoL) in educational practice?**
Ans	✓ A. AfL is an ongoing process providing feedback to guide learning, while AoL is a final evaluation measuring achievement after instruction.
	✗ B. AfL relies on standardized tests to assess progress, while AoL uses informal methods to foster student reflection.
	✗ C. AfL focuses on comparing student performance to peers, whereas AoL prioritizes individual growth and learning needs.
	✗ D. AfL is mainly summative, assigning grades at course end, whereas AoL provides continuous feedback for instructional improvement.

Q.27	**Which global event in the early 1990s contributed to the spread of democracy worldwide?**
Ans	✓ A. End of the Cold War
	✗ B. French Revolution
	✗ C. Industrial Revolution
	✗ D. First World War

Q.28	**A radioactive isotope has a half-life of 10 days. What fraction of the original sample remains after 30 days?**
Ans	✗ A. 1/2
	✓ B. 1/8
	✗ C. 1/3
	✗ D. 1/5

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Q.29	**What is the goal of the joint initiative by MNNIT, IIIT-Gwalior, and PEC, backed by the Department of Telecommunications?**
Ans	✔ A. Create a high-speed antenna for 6G communication
	✘ B. Develop AI tools for education
	✘ C. Improve rural internet connectivity through Starlink
	✘ D. Launch "Made-in-India" semiconductor chips

Q.30	**Despite having excess mobile charge carriers (electrons or holes), why are extrinsic semiconductors overall electrically neutral?**
Ans	✘ A. The mobility of the carriers is zero.
	✘ B. The temperature is too low.
	✘ C. The density of phonons compensates the charge.
	✔ D. The fixed ionized donor/acceptor atoms balance the charge of the majority carriers.

Q.31	The general solution of the differential equation $y'' - 4y' + 4y = 0$ is:
Ans	✘ A. $y = (C_1 + C_2)\, e^{2x}$
	✔ B. $y = (C_1 + C_2 x)\, e^{2x}$
	✘ C. $y = C_1\, e^{x} + C_2\, e^{2x}$
	✘ D. $y = C_1\, e^{2x} + C_2\, e^{-2x}$

Q.32	Let A be a 2×2 matrix with $\det(A) = 7$. Then, the determinant of $(3A^{-1})$ is
Ans	✘ A. 1/21
	✘ B. 3/7
	✘ C. 9/49
	✔ D. 9/7

Q.33	**Why are nitrobenzene and pyridine generally unreactive in Friedel-Crafts reactions?**

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Ans	✗ A. Strongly Activating
	✗ B. Weakly Activating
	✓ C. Strongly Deactivating
	✗ D. Sterically Hindered

Q.34	**When light passes from air into water, it generally:**
Ans	✗ A. remains at the same speed
	✓ B. slows down
	✗ C. speeds up
	✗ D. does not penetrate through water

Q.35	दिए गए वाक्य में एक वर्तनी त्रुटि है उसकी पहचान कर वाक्य को शुद्ध करें। 'मानव जाति के नैतिक अभ्योदय में शिक्षा की महत्त्वपूर्ण भूमिका होती है।'
Ans	✗ A. महत्वपूर्ण
	✓ B. अभ्युदय
	✗ C. भूमिका
	✗ D. जाति

Q.36	**Which of the following has expanded digital communication across rural India?**
Ans	✗ A. Telegram services
	✗ B. Hand-delivered letters
	✓ C. Optical fibre networks
	✗ D. Printed newspapers only

Q.37	**A compound shows Broad peak 2500–3300 cm^{-1}, strong C=O at 1710 cm^{-1} in Infra-red spectroscopy? Which of the following functional groups fits best?**

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Ans	✗ A. Amide
	✗ B. Phenol
	✗ C. Aldehyde
	✓ D. Carboxylic acid

Q.38	**Which nuclear technique employs radioactive isotopes to track water flow or study environmental pollution?**
Ans	✗ A. Radiometric dating
	✗ B. Radionuclide therapy
	✓ C. Radiotracer method
	✗ D. Gamma sterilization

Q.39	Consider the function $f(x,y) = \frac{x^2y}{x^4+y^2}$, for $(x,y) \neq (0,0)$, and $f(0,0) = 0$. Which of the following best describes the continuity of f at the point $(0,0)$?
Ans	✗ A. f is continuous only the x - axis
	✓ B. f is discontinuous at (0,0)
	✗ C. f is continuous at (0, 0)
	✗ D. f is continuous only along the y - axis

Q.40	The expression $\sin(\sin^{-1}x)$ equals _____.
Ans	✗ A. always undefined
	✓ B. x for $x \in [-1, 1]$
	✗ C. $\lvert x \rvert$
	✗ D. x for all real x

Q.41	**According to the August 2025 SC judgment on stray dogs, which dogs cannot be returned to public spaces?**

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Ans	✗ A. Vaccinated ones
	✓ B. Rabbid or aggressive ones
	✗ C. Sterilised ones
	✗ D. All stray dogs

Q.42	**In a tunnel diode, the peak current occurs when:**
Ans	✗ A. Voltage reaches breakdown
	✓ B. Overlap of filled states (n-side) and empty states (p-side) is maximum
	✗ C. Depletion region disappears
	✗ D. Fermi levels are completely misaligned

Q.43	**In the context of the superposition of two perpendicular simple harmonic motions (SHMs), if the two SHMs have different amplitudes and an arbitrary phase difference, the resultant motion is generally what type of polarization?**
Ans	✗ A. Linear
	✓ B. Elliptical
	✗ C. Un-polarized
	✗ D. Circular

Q.44	**Compared with the bisection method, the false position method:**
Ans	✗ A. Always produces symmetric intervals.
	✗ B. Requires function derivatives.
	✓ C. Uses linear interpolation and can converge faster for some functions.
	✗ D. Is guaranteed to reduce the interval length by half each iteration.

Q.45	**For the ellipse $x^2/16 + y^2/9 = 1$, find eccentricity.**
Ans	✓ A. $\sqrt{7}/4$

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	✗ B. 1/4
	✗ C. 7
	✗ D. 3

Q.46	**Based on the English alphabetical order, three of the following four letter cluster pairs are alike in a certain way and thus form a group. Which is the one that does not belong to that group? (Note: The odd one out is not based on the number of consonants/vowels or their position in the letter cluster)**
Ans	✗ A. OS - RV
	✗ B. QU - TX
	✓ C. CG - KP
	✗ D. LP - OS

Q.47	**If the distance between two masses is doubled, the gravitational force becomes:**
Ans	✓ A. One-fourth
	✗ B. Half
	✗ C. Double
	✗ D. Four times

Q.48	**किसी शिक्षक की आत्म-जागरूकता कक्षा की गतिशीलता को कैसे प्रभावित करती है?**
Ans	✗ A. यह विद्यार्थियों के साथ अर्थपूर्ण जुड़ाव के अवसरों को कम करता है
	✗ B. यह शिक्षकों की विविध शिक्षार्थियों की आवश्यकताओं के अनुरूप अनुकूल प्रतिक्रिया देने की क्षमता को सीमित करता है
	✓ C. यह मूल्यों और संवेगों को शिक्षण के साथ संरेखित करता है, जिससे एक वास्तविक और अनुक्रियाशील कक्षा का निर्माण होता है
	✗ D. यह अनुदेशनात्मक फोकस को पाठ्यचर्या के अनिवार्य नियमों के कठोर पालन तक सीमित कर देता है

Q.49	Let p and q be two positive numbers. If the arithmetic mean (AM) and the geometric mean (GM) of p and q are equal, then which of the following is correct?

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Ans	✗ A. p>q
	✗ B. p : q = 2 : 1
	✓ C. p = q
	✗ D. p not equal to q

Q.50	If P(A) = 0.5 and P(A∩B) = 0.2, then P(B|A) = _____.
Ans	✓ A. 0.4
	✗ B. 0.5
	✗ C. 0.2
	✗ D. 0.3

Q.51	वर्ष 1857 के विद्रोह के दौरान, एक 80 वर्षीय जमींदार एक प्रमुख विद्रोही सेनापति के रूप में उभरा। वह किस राजपूत घराने से संबंधित था?
Ans	✗ A. बरेली
	✗ B. झाँसी
	✓ C. जगदीशपुर
	✗ D. कानपुर

Q.52	Which government initiative is specifically targeted to improve literacy among adults and non-literate youth aged 15 and above?
Ans	✓ A. Sakshar Bharat
	✗ B. Mid-Day Meal Scheme
	✗ C. Rashtriya Uchchatar Shiksha Abhiyan
	✗ D. Sarva Shiksha Abhiyan

Q.53	किस भाषा कौशल को ग्राही कौशल माना जाता है, जिसमें बोली जाने वाली भाषा का बोध शामिल होता है?
Ans	✗ A. लेखन

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	✗ B. पठन
	✓ C. श्रवण
	✗ D. वादन

Q.54	**The phenomenon where birefringent materials rotate the polarization plane is called _____.**
Ans	✗ A. Dichroism
	✗ B. Double refraction
	✓ C. Optical activity
	✗ D. Rayleigh scattering

Q.55	**Constructivist teaching strategies differ from traditional ones because they:**
Ans	✓ A. Encourage active and meaningful learning
	✗ B. Use only digital media for teaching
	✗ C. Focus on knowledge transfer
	✗ D. Avoid any form of learner assessment

Question Type :	**MCQ**
Question ID :	**4410091513099**
Option 1 ID :	**4410095976427**
Option 2 ID :	**4410095976428**
Option 3 ID :	**4410095976426**
Option 4 ID :	**4410095976429**
Status :	**Answered**
Chosen Option :	**A**

Q.56	**When a beam of unpolarized light enters a uniaxial crystal such as calcite, it splits into two rays because:**
Ans	✓ A. The refractive index differs for light polarized parallel and perpendicular to the optic axis
	✗ B. The refractive index is the same for all directions of propagation
	✗ C. The crystal absorbs part of the incident light
	✗ D. Crystal is optically isotropic

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Q.57	**The type of radioactive decay that does NOT change the mass number is _____.**
Ans	✗ A. Both alpha and beta decay
	✓ B. Beta decay only
	✗ C. Neutron emission only
	✗ D. Alpha decay only

Q.58	Given the recursive sequence $a_1 = 1$, $a_{n+1} = \frac{1}{2}\left(a_n + \frac{2}{a_n}\right)$. The limit of the sequence (a_n) as $n \to \infty$ is:
Ans	✗ A. 1
	✗ B. 2
	✗ C. Divergent
	✓ D. $\sqrt{2}$

Q.59	**Kullu Valley, known as the 'Valley of Gods,' is famous for its vibrant Dussehra festival and is situated along the banks of which major Himalayan river?**
Ans	✗ A. Yamuna River
	✓ B. Beas River
	✗ C. Ravi River
	✗ D. Sutlej River

Q.60	**कौन-सी योजना निर्धन परिवारों को LPG कनेक्शन प्रदान करती है?**
Ans	✗ A. DDU-GKY
	✗ B. PMAY-G
	✓ C. PM उज्ज्वला योजना
	✗ D. DAY-NRLM

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Q.61	**The critical magnetic field of a superconductor _____.**
Ans	✗ A. Is minimum at absolute zero
	✗ B. Is zero at absolute zero
	✗ C. Is maximum at the critical temperature
	✓ D. Is maximum at absolute zero

Q.62	**Which structure in our throat helps in producing sound through vibration?**
Ans	✓ A. Larynx
	✗ B. Pharynx
	✗ C. Tongue
	✗ D. Ear drum

Q.63	The solution of the differential equation $(x + 2y)\,dx + (2x - y)\,dy = 0$ is _____.
Ans	✓ A. $\frac{x^2}{2} + 2xy - \frac{y^2}{2}$
	✗ B. $\frac{x^2}{2} - 2xy - \frac{y^2}{2}$
	✗ C. $\frac{x^2}{2} - 2xy + \frac{y^2}{2}$
	✗ D. $\frac{x^2}{2} + 2xy + \frac{y^2}{2}$

Q.64	**The polymerization type for Kevlar is:**
Ans	✓ A. Step-growth polymerization (Condensation)
	✗ B. Chain-growth polymerization
	✗ C. Ziegler–Natta polymerization
	✗ D. Free radical polymerization

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Q.65	**The VSEPR model predicts molecular shape based on:**
Ans	✗ A. Attraction between nuclei and delocalized bonding electrons
	✗ B. Hybridization of atomic orbitals in central atoms
	✓ C. Repulsion between bonding and lone electron pairs
	✗ D. Molecular polarity and bond dipole moment strength

Q.66	**Which of the following is not correct about vocation courses?**
Ans	✗ A. Vocational courses should have a competency-based curriculum for ensuring excellence
	✗ B. Vocational courses are planned after an entailed analysis of the functions and tasks expected to be performed by a worker in that area
	✓ C. Vocational courses are not standardised
	✗ D. Vocational courses cover both study of theoretical principles and practical operational details

Q.67	**A shoe manufacturer wants to buy wheat. In an economy with money, what is the first thing he must do?**
Ans	✓ A. Exchange shoes for money
	✗ B. Grow his own wheat
	✗ C. Exchange shoes directly for wheat
	✗ D. Find a farmer who wants to buy shoes

Q.68	**Given a field F and a polynomial f(x) in F[x], under what condition is the quotient ring F[x]/(f(x)) a field?**
Ans	✓ A. Only if f(x) is irreducible over F
	✗ B. Only if f(x) is reducible over F
	✗ C. Only if f(x) has a root in F
	✗ D. Only if F is finite

Q.69	**What was the share of the secondary sector in Himachal Pradesh's GSDP in 1950-51?**

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Ans	✗ A. 5.20%
	✗ B. 12.00%
	✓ C. 7.41%
	✗ D. 10.50%

Q.70	**Anomalous dispersion occurs when the refractive index of a medium:**
Ans	✗ A. Increases with increasing frequency
	✗ B. Becomes independent of absorption
	✓ C. Decreases with increasing frequency
	✗ D. Remains constant with frequency

Q.71	**Which assumption was crucial for the classical prediction of fringe shift in the Michelson–Morley experiment?**
Ans	✗ A. Ether is at rest with respect to Earth
	✓ B. Ether is stationary and Earth moves through it
	✗ C. Light speed is invariant
	✗ D. Length contraction occurs

Q.72	Let $u = x^2 + y^2 + z^2$, $x = r\cos\theta$, $y = r\sin\theta$, $z = z$. The partial derivative $\frac{\partial u}{\partial r}$ is:
Ans	✓ A. $2r$
	✗ B. $2r + 2z$
	✗ C. $2r\cos\theta$
	✗ D. $2r\sin\theta$

Q.73	**For every particle in our universe, there must be an antiparticle with opposite charge. This principle is proved by the _____.**
Ans	✗ A. Parity violation theorem

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	✗ B. Gell-Mann – Nishijima formula
	✗ C. Strong nuclear force
	✓ D. CPT theorem

Q.74	दिए गए वाक्य के रेखांकित शब्द का विलोम पहचानें- बीमार व्यक्ति को दीर्घ विश्राम की आवश्यकता थी।
Ans	✓ A. ह्रस्व
	✗ B. लंबा
	✗ C. विशाल
	✗ D. विस्तृत

Q.75	For the differential equation $dy/dx + y = e^x$, which of the following represents its general solution?
Ans	✗ A. $y = Ce^{-x} + e^x$
	✗ B. $y = Ce^x + e^x$
	✗ C. $y = Ce^x + e2^x$
	✓ D. $y = Ce^{-x} + \frac{1}{2}e^x$

Q.76	Which of the following lakes is a freshwater lake formed by the Jhelum River in the Kashmir Valley?
Ans	✗ A. Sambhar Lake
	✓ B. Wular Lake
	✗ C. Chilika Lake
	✗ D. Pulicat Lake

Q.77	'जिसके प्रति संदेह हो' वाक्यांश के लिए सार्थक शब्द चुनिये
Ans	✗ A. संदेहशील

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	✗ B. सन्देही
	✓ C. संदिग्ध
	✗ D. सन्देशास्पद

Q.78	**The current in a MOSFET channel is controlled by:**
Ans	✓ A. Gate-to-source voltage
	✗ B. Drain current only
	✗ C. Gate current
	✗ D. Breakdown voltage

Q.79	**Conductivity of a solution is directly proportional to:**
Ans	✗ A. Molar mass of ions
	✗ B. Temperature only
	✓ C. Number of ions per unit volume
	✗ D. Volume of solvent

Q.80	If $f(x, y) = 2x^2 - 3xy^2 + x^2y$, then $\frac{\partial f}{\partial x} - \frac{\partial f}{\partial y} =$ _____.
Ans	✗ A. $4x(1 - 2y) + (x^2 - 3y^2)$
	✓ B. $4x(1 + 2y) - (x^2 + 3y^2)$
	✗ C. $4x(1 - 2y) - (x^2 - 3y^2)$
	✗ D. $4x(1 + 2y) - (x^2 - 3y^2)$

Q.81	**Which act emphasizes the integration of students with disabilities into normal schools in India?**
Ans	✓ A. The Right to Education (RTE) Act, 2009
	✗ B. The Education Act, 1986

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	✗ C. The Disability Rights Act, 2010
	✗ D. The Inclusive Education Act, 2015

Q.82	**$\int[x^2/(x-1)(x+2)]dx$ requires _____.**
Ans	✗ A. Integration by parts
	✗ B. Direct substitution
	✓ C. Partial fractions (after long division)
	✗ D. Trigonometric substitution

Q.83	**A student performs an experiment to determine the chemical composition of an unknown solution. Which type of analysis should they perform to identify the substances present, and which type to determine their amounts?**
Ans	✗ A. Only quantitative analysis is needed for both identification and amount determination
	✗ B. Only qualitative analysis is needed for both identification and amount determination
	✗ C. Quantitative analysis to identify the substances; Qualitative analysis to determine their amounts
	✓ D. Qualitative analysis to identify the substances; Quantitative analysis to determine their amounts

Q.84	**If the rest mass energy of an electron is 0.511 MeV, calculate the speed of an electron that has a kinetic energy of 5.11 MeV.**
Ans	✓ A. 0.996c
	✗ B. 0.796c
	✗ C. 0.896c
	✗ D. 0.696c

Q.85	Let A = {0, 1, 2, 3, 4}. Which of the following relations on A is not transitive?
Ans	✓ A. $R_3 = \{(0, 0), (1, 1), (2, 2), (0, 1), (1, 0), (1, 2), (2, 1)\}$
	✗ B. $R_1 = \{(0, 0), (0, 1), (0, 2), (1, 1), (1, 2), (2, 2), (3, 3)\}$

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	✗ C. $R_4 = \{(4, 0), (3, 2), (1, 1), (0, 0),\}$
	✗ D. $R_2 = \{(0, 0), (1, 1), (2, 2),(3, 3), (4, 4)\}$

Q.86	**Which Constitutional Amendment made elementary education a fundamental right in India?**
Ans	✓ A. 86th Amendment
	✗ B. 44th Amendment
	✗ C. 73rd Amendment
	✗ D. 42nd Amendment

Q.87	**The value of $(1+i)^{10}$ is**
Ans	✗ A. i
	✗ B. 1
	✓ C. 32i
	✗ D. 32

Q.88	**The Indira Gandhi Sukh Suraksha Yojana, announced in Himachal Pradesh Budget 2025-26, provides for the deposit of how much money in an insurance company upon the birth of a girl child in a below-poverty line family?**
Ans	✓ A. ₹25,000
	✗ B. ₹15,000
	✗ C. ₹50,000
	✗ D. ₹10,000

Q.89	**In anisotropic crystals, polarization occurs mainly because of _____.**
Ans	✗ A. Random motion of electrons
	✓ B. Direction-dependent electric susceptibility
	✗ C. Constant refractive index
	✗ D. External heating

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Q.90	Let u, v, w > 0 and their geometric mean is 8. If their arithmetic mean is minimum possible, the value of u + v + w is:
Ans	✔ A. 24
	✘ B. 30
	✘ C. 18
	✘ D. 20

Q.91	Consider the LPP. Max $z = 3x - 2y$ sub to $2x + 5y \leq 1;\ x - y \leq 3;\ 3x + 4y \geq 6;\ x \geq 0, y \geq 0.$ Then which of the following is ture?
Ans	✘ A. two disjoint feasible regions, one is bounded and other is unbounded
	✘ B. only one unbounded feasible region
	✘ C. only one bounded feasible region
	✔ D. no feasible region

Q.92	**उसकी दुरावस्था देखकर सबको दया आ गयी। वाक्य का शुद्ध रूप क्या है?**
Ans	✘ A. उसकी दुरवस्तथा देखकर सबको दया आ गयी।
	✘ B. उसकी दुवस्था देखकर सबको दया आ गयी।
	✔ C. उसकी दुरवस्था देखकर सबको दया आ गयी।
	✘ D. उसकी दुरचस्था देखकर सबको दया आ गयी।

Q.93	**Which of the following increases the rate of nucleophilic aromatic substitution (SNAr)?**
Ans	✔ A. Electron-withdrawing groups (EWG) at ortho/para positions
	✘ B. Electron-donating groups (EDG) at ortho/para positions
	✘ C. Presence of bulky nucleophile
	✘ D. Highly protic solvent always

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Q.94	**In an isochoric process, the work done is _____.**
Ans	✔ A. Zero
	✘ B. PΔV
	✘ C. Maximum
	✘ D. Negative

Q.95	**The resolving power of a diffraction grating increases with _____.**
Ans	✘ A. Decrease in number of slits
	✔ B. Increase in number of slits
	✘ C. Decrease in intensity
	✘ D. Increase in wavelength

Q.96	In the bisection method, which condition ensures that a root lies in the interval [a,b]?
Ans	✘ A. f(a) = f(b)
	✘ B. $f(a)f(b) > 0$
	✘ C. $f(a) + f(b) = 0$
	✔ D. $f(a)f(b) < 0$

Q.97	**Which of the following approaches fosters the development of individual students by accommodating their varied interests, experiences, learning styles, needs, and ability levels?**
Ans	✘ A. Teacher based learning
	✘ B. Content based learning
	✘ C. Result based learning
	✔ D. Resource based learning

Q.98	**Which tissue helps in the upward movement of water and minerals in a plant?**

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Ans	✗ A. Sclerenchyma
	✓ B. Xylem
	✗ C. Parenchyma
	✗ D. Phloem

Q.99	'जरूरत से कम देना' अर्थ के लिए उपयुक्त लोकोक्ति है-

Ans	✓ A. ऊँट के मुँह में जीरा
	✗ B. एक पंथ दो काज
	✗ C. आम के आम गुठलियों के दाम
	✗ D. एक अनार सौ बीमार

Q.100	**Which movement is described as a rebellion in the present-day Bilaspur region, arising from oppressive British land revenue policies and unfavorable settlement patterns?**

Ans	✓ A. Dandra Rebellion Movement
	✗ B. Kangra Resistance Action
	✗ C. Baghat Peasant Uprising
	✗ D. Sirmaur Reform Agitation

Q.101	निम्नलिखित वाक्य के उस भाग का चयन करें जिसमें वर्तनी अशुद्ध है- 'आज बाज़ार में उसे धोके से लूट लिया गया'

Ans	✗ A. गया
	✓ B. धोके से
	✗ C. लूट लिया
	✗ D. आज बाज़ार में उसे

Q.102	वेब-आधारित सहायक शिक्षण साधन _____ को सक्षम बनाकर अधिगम प्रभावशीलता को बढ़ाते हैं।

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Ans	✗ A. केवल पूर्वनिर्धारित उत्तर प्रारूपों के उपयोग
	✓ B. ज्ञान के साझा सृजन
	✗ C. सूचना के एकतरफा संचरण
	✗ D. बिना अंतःक्रिया के स्वतंत्र अध्ययन

Q.103	**The Zeroth Law of Thermodynamics establishes the concept of:**
Ans	✗ A. Conversion of mass into radiant energy
	✗ B. Decrease of work during adiabatic expansion
	✗ C. Constant entropy in cyclic reactions
	✓ D. Thermal equilibrium between interacting systems

Q.104	**What are the possible charges of a β particle?**
Ans	✗ A. Only –1
	✗ B. Only +1
	✓ C. Either –1 or +1
	✗ D. Zero

Q.105	**In hydrolysis of tert-butyl chloride, the rate depends on:**
Ans	✗ A. Concentration of both water and alkyl-halide
	✓ B. Concentration of alkyl halide only
	✗ C. Independent to concentrations
	✗ D. Concentration of water only

Q.106	**Identify the error and choose the correct sentence** **If you consult dictionary, you will find the meaning of this word.**

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Ans	✔ A. If you consult a dictionary, you will find the meaning of this word.
	✘ B. If you consult dictionary, you will not find the meaning of this word.
	✘ C. If you consulted a dictionary, you will find the meaning of this word.
	✘ D. If you have consult a dictionary, you will find the meaning of this word.

Q.107	**Which factor is most vital for accomplishing inclusive education goals?**
Ans	✔ A. Teacher's attitude
	✘ B. School infrastructure
	✘ C. Parental involvement
	✘ D. Student assessments

Q.108	**A vector having magnitude 1 is called :**
Ans	✘ A. Position vector
	✘ B. Null vector
	✔ C. Unit vector
	✘ D. Negative vector

Q.109	**निम्नलिखित विकल्पों में से दिए गए मुहावरा के सही अर्थ की पहचान कीजिए।** **'टेढ़ी खीर होना'**
Ans	✔ A. अत्यधिक कठिन कार्य करना
	✘ B. अपनी दीनता का प्रदर्शन करना
	✘ C. अपनी असहायता प्रकट करना
	✘ D. उम्मीद से ज़्यादा होशियार बनना

Q.110	**When two gases in separate containers share a common movable wall, mechanical equilibrium is attained when**
Ans	✘ A. The densities of both gases are equal

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	✗ B. The temperatures of both gases are equal
	✗ C. The volumes of both gases are equal
	✓ D. The pressures of both gases are equal

Q.111	**Electron affinity can be viewed as:**
Ans	✗ A. Energy difference between successive ionization potentials
	✗ B. Work done to move electrons between isoelectronic ions
	✓ C. Energy released when an atom gains an additional electron
	✗ D. Energy required to remove an electron from a negative ion

Q.112	**Which of the following is NOT a characteristic of a wavefunction?**
Ans	✗ A. Wavefunction must be finite
	✗ B. Wavefunction must be continuous
	✓ C. Wavefunction can have multiple values and should be finite
	✗ D. Wavefunction should be differentiable

Q.113	**If you have vitamin A deficiency, intake of which of the following should be increased?**
Ans	✗ A. Wheat
	✗ B. Pulses
	✓ C. Carrots
	✗ D. Rice

Q.114	If z is a non − zero complex number, then which of the following is true?
Ans	✗ A. $z + \bar{z}$ is non zero real
	✓ B. $\bar{z}$ is a positive real number
	✗ C. $\frac{z}{\bar{z}}$ is a positive real number

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	✗ D. $z - \bar{z}$ is purely imaginary number

Q.115	**Which of the following is an open set in the complex plane?**
Ans	✓ A. {z:|z|<1}
	✗ B. {z:|z|≤1}
	✗ C. {z:|z|=1}
	✗ D. {z:ℜ(z)≥0}

Q.116	**Which statement correctly describes why tooth decay starts when the pH of the mouth falls below 5.5?**
Ans	✗ A. The saliva becomes unable to produce any more bases for neutralization.
	✗ B. The taste buds become inactive, making the person unable to sense sour foods.
	✓ C. The enamel of the teeth begins to dissolve due to the acidic environment.
	✗ D. The bacteria in the mouth die off, leading to a breakdown of the gums.

Q.117	**'जो किसी के अधीन या पराधीन न हो' वाक्यांश के लिए सार्थक शब्द है :-**
Ans	✗ A. सर्वज्ञ
	✗ B. सानी
	✗ C. स्वर्गीय
	✓ D. स्वाधीन

Q.118	If two events A and B satisfy $P(A)=\frac{1}{2}$, $P(B)=\frac{1}{3}$ and $P(A\cap B)=\frac{1}{6}$, then what is the value of $P(A \mid B$
Ans	✗ A. 1/4
	✗ B. 1/6
	✗ C. 1/3
	✓ D. 1/2

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Q.119	**In a 1 molal solution of benzoic acid in benzene, the observed elevation of boiling point corresponds to a van't Hoff factor = 0.5. Which of the following could be the most probable reason?**
Ans	✗ A. Benzene reacts with benzoic acid
	✗ B. Benzoic acid dissociates in benzene
	✗ C. Benzoic acid sublimes partially
	✓ D. Benzoic acid associates to form dimers

Q.120	**The 12^{th} term of an AP is twice the 6^{th} term, Find a:d**
Ans	✗ A. -2:1
	✗ B. 1:2
	✓ C. 1:1
	✗ D. -1:1

Q.121	**Which groups controlled a large sector of Indian industries until the First World War by mobilizing capital and making key investment decisions?**
Ans	✗ A. Parsi and Marwari businessmen
	✗ B. The British colonial government
	✗ C. Indian bankers and merchants
	✓ D. European Managing Agencies

Q.122	**In α-decay, the daughter nucleus has:**
Ans	✗ A. Atomic mass unchanged and atomic number decreased by 1
	✗ B. Atomic mass unchanged and atomic number increased by 1
	✓ C. Atomic mass decreased by 4 and atomic number decreased by 2
	✗ D. Atomic mass increased by 4 and atomic number increased by 2

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Q.123	**Which of the following is the bond length of each C–C bond in benzene approximately?**
Ans	✗ A. 0.159 nm
	✓ B. 0.139 nm
	✗ C. 0.129 nm
	✗ D. 0.149 nm

Q.124	Let $\vec{p}$ be a non−zero vector and satisfies $\vec{p} \times (\lambda\vec{p}) = 0$ for every real λ, then which of the following is correct?
Ans	✗ A. p is always perpendicular to itself
	✗ B. p is a unit vector
	✓ C. All scalar multiples of p are parallel vetors
	✗ D. p is a null vector

Q.125	**For which of the following curves is the line x = 2 a vertical asymptote?**
Ans	✗ A. $y = \sqrt{2x-1}$
	✓ B. $y = \frac{1}{x-2}$
	✗ C. $y = \sin(x-2)$
	✗ D. $y = x^2 - 2x$

Q.126	**Which of the following is the deepest landlocked port used for exporting iron ore?**
Ans	✗ A. Paradip
	✗ B. Mumbai
	✗ C. Kolkata
	✓ D. Vishakhapatnam

Q.127	**Aldehydes are usually more reactive than ketones toward nucleophilic addition because:**

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Ans	✗ A. Aldehydes have no resonance stabilization
	✗ B. Aldehydes have less steric hindrance and are less electrophilic than ketones
	✗ C. Aldehydes have a stronger C=O bond
	✓ D. Aldehydes have less steric hindrance and are more electrophilic than ketones

Q.128	**Which state won 10 gold medals at the Khelo India Water Sports Festival 2025?**
Ans	✗ A. Kerala
	✗ B. Jammu & Kashmir
	✓ C. Madhya Pradesh
	✗ D. Odisha

Q.129	**Parts of a sentence are given below. The first part (A) is in the correct order, while the other parts of the sentence are jumbled up. Arrange the parts in the correct order to form a meaningful and coherent sentence.** **A. Groundwater recharge** **B. of groundwater replenishment** **C. enhance the natural process** **D. structures are designed to**
Ans	✓ A. ADCB
	✗ B. ACBD
	✗ C. ABCD
	✗ D. ABDC

Q.130	**Which Maxwell equation shows that electrostatic fields are irrotational?**
Ans	✗ A. $\nabla \cdot B = 0$
	✗ B. $\nabla \times B = \mu_0 J$
	✓ C. $\nabla \times E = 0$ (for static fields)
	✗ D. $\nabla \cdot E = \rho/\varepsilon_0$

Q.131	**Which river draining Himachal Pradesh originates outside the state but forms an important part of its drainage system?**

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Ans	✗ A. Beas
	✗ B. Parvati
	✗ C. Uhl
	✓ D. Satluj

Q.132	**A 5.1 volt Zener diode is used as a shunt regulator. The input supply is V_S = 12 volt. The series resistor is R_S = 330 Ω. If the load is removed (open-circuit), what will be the Zener current?**
Ans	✓ A. 20 mA
	✗ B. 15 mA
	✗ C. 10 mA
	✗ D. 30 mA

Q.133	**Which relation is correct?**
Ans	✗ A. $\Delta = E^2 - 1$
	✗ B. $\Delta = 1 - E$
	✓ C. $\Delta = E - 1$
	✗ D. $\Delta = E - E^{-1}$

Q.134	**Which of the following steps is the rate-determining step in the free radical addition of HBr to alkenes?**
Ans	✗ A. Initiation
	✗ B. Termination
	✓ C. Hydrogen abstraction
	✗ D. Propagation

Q.135	**Which of the following correctly explains why the second law of thermodynamics does not violate microscopic reversibility?**
Ans	✗ A. Individual molecular collisions are time-irreversible
	✓ B. Entropy increase is a statistical outcome due to overwhelming probability of equilibrium macrostates

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	✗ C. Energy conservation does not hold at the microscopic scale
	✗ D. The direction of time is not defined at the atomic scale

Q.136	**The average power delivered in a pure capacitor AC circuit is _____.**
Ans	✓ A. Zero
	✗ B. Depends on voltage
	✗ C. Maximum
	✗ D. Depends on frequency

Q.137	**A set of societal norms dictating the types of behaviors that are generally considered acceptable, appropriate, or desirable for people based on their actual or perceived sexuality is called _____.**
Ans	✗ A. Gender inclusivity
	✓ B. Gender role
	✗ C. Gender biases
	✗ D. Gender inequality

Q.138	**SAMR मॉडल में, अधिगम परिणामों को बदले बिना पेन-एंड-पेपर पर आधारित कार्यों को तकनीक से प्रतिस्थापित करना किस चरण को दर्शाता है?**
Ans	✗ A. संशोधन (Modification)
	✗ B. आवर्धन (Augmentation)
	✗ C. पुनर्परिभाषा (Redefinition)
	✓ D. प्रतिस्थापन (Substitution)

Q.139	**The accuracy of volumetric analysis depends mainly on:**
Ans	✗ A. Determination of molar mass through mass spectrometric measurements
	✗ B. Measurement of solution color intensity using spectrophotometric analysis
	✓ C. Proper standardization, clean apparatus, and precise end-point detection

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	✗ D. Maintenance of constant temperature during the entire drying process

Q.140	**The electron lepton number of an electron is:**
Ans	✗ A. +2
	✗ B. -1
	✗ C. 0
	✓ D. +1

Q.141	**Which factor should be checked before participating in adventure sports to avoid health risks?**
Ans	✓ A. Pre-existing medical conditions
	✗ B. Type of clothing worn
	✗ C. Presence of a trainer
	✗ D. The number of participants

Q.142	**What is the name of the system formed by the brain along with the spinal cord?**
Ans	✗ A. Peripheral nervous system
	✓ B. Central nervous system
	✗ C. Autonomic nervous system
	✗ D. Reflex system

Q.143	**Identify the ANTONYM of the highlighted word from the options given below.** **The professor's lucid explanation helped students grasp the complex concept easily**
Ans	✗ A. coherent
	✓ B. unclear
	✗ C. transparent
	✗ D. opaque

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Q.144	**When an endothermic reaction occurs spontaneously ($\Delta H > 0$), which of the following must be true according to the relation $\Delta G = \Delta H - T\Delta S$?**
Ans	✗ A. $\Delta S < 0$ and $\Delta G < 0$
	✗ B. $\Delta S = 0$ and $\Delta G = 0$
	✓ C. $\Delta S > 0$ and $T\Delta S > \Delta H$
	✗ D. $\Delta S < 0$ and $T\Delta S < \Delta H$

Q.145	**Which of the following structures best displays delocalization of π-electrons by resonance?**
Ans	✓ A. Benzene (C_6H_6)
	✗ B. Propene ($CH_3–CH=CH_3$)
	✗ C. Ethene ($CH_2=CH_2$)
	✗ D. Cyclohexene (C_6H_{10})

Q.146	**For which particles is the total wavefunction antisymmetric?**
Ans	✗ A. Mesons
	✗ B. Photons
	✗ C. Helium atom
	✓ D. Electrons

Q.147	**Why is Ce^{4+} unique among the lanthanides in an aqueous solution?**
Ans	✗ A. Because Ce^{4+} undergoes complete reduction to Ce^{3+} and behaves as a mild reducing agent in water
	✓ B. Because Ce^{4+} is strongly hydrated and acts as a powerful oxidizing agent in acidic medium
	✗ C. Because Ce^{4+} remains unhydrolysed and does not interact with water molecules in solution
	✗ D. Because Ce^{4+} has low hydration energy and forms simple stable ionic species in solution

Q.148	**Six people H, I, J, K, U and V live on six different floors of the same building. The lowermost floor in the building is numbered 1, the floor above it, number 2 and so on till the topmost floor is numbered 6. Only J lives above K. Only two people lives between V and I. U lives on an even numbered floor. V lives on the lowermost floor. How many people live between H and J?**

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Ans	✗ A. Four
	✓ B. Two
	✗ C. One
	✗ D. Three

Q.149	उपयुक्त 'कारक' चिह्न का चयन कर रिक्त स्थान की पूर्ति कीजिए। ' पेड़ .....आम गिरता है।'

Ans	✗ A. के लिए
	✗ B. पे
	✓ C. से
	✗ D. ने

Q.150	**Departmentally Related Standing Committees (DRSCs) were introduced in which year?**

Ans	✓ A. 1993
	✗ B. 2001
	✗ C. 1980
	✗ D. 1951

Q.151	**Osmotic pressure is defined as the pressure:**

Ans	✗ A. Developed when solvent evaporates completely
	✓ B. Required to stop osmosis of solvent into solution
	✗ C. Causing diffusion of solute through membrane
	✗ D. Needed to dissolve solute in the pure solvent

Q.152	Evaluate the limit $L = \lim_{x \to 0} \frac{\sin(3x) - 3x + x^3}{x^5}$. Which of the following is correct?

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Ans	✗ A. 3/20
	✓ B. 9/40
	✗ C. -9/40
	✗ D. 0

Q.153	**In the decay $\mu^- \rightarrow e^- + \bar{\nu}_e + \nu_\mu$, which of the following is conserved?**
Ans	✓ A. Lepton number
	✗ B. Strangeness
	✗ C. Charge only
	✗ D. Baryon number only

Q.154	If the matrix $A = \begin{pmatrix} 3 & 1 \\ 2 & k \end{pmatrix}$ is a singular matrix, then the value of k is
Ans	✗ A. 1/2
	✓ B. 2/3
	✗ C. 2
	✗ D. No article is required

Q.155	**Choose the correct option to complete the sentence.** **_____ river, which originates from the mountain, flows through his village.**
Ans	✗ A. A
	✗ B. An
	✓ C. The
	✗ D. No article is required

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Q.156	**Replace the underlined part of the sentence with the correct idiom from the given options.** **In a city with so many coffee shops, good ones are <u>very common and easy to find</u>.**
Ans	✗ A. like a wolf in sheep's clothing
	✗ B. like two peas in a pod
	✓ C. a dime a dozen
	✗ D. an icing on the cake

Q.157	**Which factor shapes an individual's social identity?**
Ans	✓ A. Cultural background
	✗ B. Physical strength
	✗ C. Random choice
	✗ D. Isolated actions

Q.158	**In the methoxy group (-OCH_3) attached to a benzene ring, the oxygen atom donates electron density by resonance but exerts an electron-withdrawing inductive effect. What is the net electronic effect of the methoxy group when considering its overall influence on aromatic electrophilic substitution?**
Ans	✗ A. Meta-directing
	✓ B. Strong ortho-para directing
	✗ C. Strong meta-directing
	✗ D. Weak ortho-para directing

Q.159	**For a BJT to operate in the active amplification region, the emitter-base junction must be forward biased, and the base-emitter junction should be characterised by _____.**
Ans	✗ A. High input resistance
	✓ B. Low input resistance
	✗ C. Infinite input resistance
	✗ D. Zero input resistance

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Q.160	**What is the process called when sugar (like sucrose) is heated so intensely that the molecules break apart, leading to a golden-brown colour and a deep, nutty flavour?**
Ans	✗ A. Lipolysis
	✓ B. Caramelisation
	✗ C. Saccharification
	✗ D. Crystallisation

Q.161	**Which of the following is always a subgroup of a group G?**
Ans	✗ A. A non-empty subset closed under inverses
	✓ B. A non-empty subset closed under the group operation and inverses
	✗ C. Any subset containing the identity
	✗ D. A non-empty subset closed under the binary operation

Q.162	**If 1 is added to each odd digit and 2 is subtracted from each even digit in the number 1687542, what will be the difference of the digits which are second from the left and second from the right in the new number thus formed?**
Ans	✗ A. 3
	✗ B. 0
	✗ C. 1
	✓ D. 2

Q.163	**What should teachers focus on during the sensorimotor stage, according to Laura Berk?**
Ans	✓ A. Sensory experiences and motor activities
	✗ B. Moral reasoning discussions
	✗ C. Developing abstract concepts
	✗ D. Social interaction skills

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Q.164	**In a reaction where the stoichiometric coefficient of a reactant is 2, but the order of the reaction with respect to that reactant is found to be 1, what does this reveal about the reaction mechanism?**
Ans	✗ A. The reaction must be a termolecular process.
	✗ B. The reaction rate is independent of reactant's concentration.
	✓ C. The mechanism is complex and does not occur in a single step.
	✗ D. The reaction is definitely an elementary step.

Q.165	For a polynomial $f(x)$ of degree n, the finite difference $\Delta^{(n+1)}f(x)$ equals to __.
Ans	✓ A. Zero
	✗ B. Depend upon the grid spacing h
	✗ C. A constant
	✗ D. n!

Q.166	A particle is under a central force $\vec{F}(r) = -\frac{k}{r^2}\hat{r}$. The corresponding potential energy $V(r)$ is ____. (choosing $V(\infty) = 0$)
Ans	✗ A.
	✓ B.
	✗ C.
	✗ D.

Q.167	**Which of the following ions shows the highest hydration enthalpy?**
Ans	✗ A. Na^+
	✗ B. Rb^+
	✗ C. K^+
	✓ D. Li^+

Q.168	**Select the correct one-word substitution for the given group of words.** **The deliberate and systematic extermination of a particular race, community, or nation**
Ans	✗ A. Fratricide
	✓ B. Genocide
	✗ C. Homicide
	✗ D. Regicide

Q.169	**In Einstein's theory of specific heat, each atom in the crystal is modeled as _____.**
Ans	✗ A. A rigid rotor with quantized rotational energy
	✗ B. A classical harmonic oscillator of variable frequency
	✗ C. A free particle with translational kinetic energy only
	✓ D. A three dimensional quantum harmonic oscillator for frequency ν_E

Q.170	**Based on the polarizing power of cations and the polarizability of anions, which combination forms the most covalent bond?**
Ans	✗ A. Li^+ and F^-
	✗ B. Mg^{2+} and O^{2-}
	✗ C. Na^+ and Cl^-
	✓ D. Li^+ and I^-

Q.171	**A peace teacher demonstrates:**
Ans	✗ A. Strictness
	✗ B. High academic focus
	✓ C. Empathy and inclusiveness
	✗ D. Neutrality

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Q.172	A Fresnel zone plate is designed for light of wavelength λ_1 and has a first – order focal length f_1 for that wavelength. For a shorter wavelength $\lambda_2 < \lambda_1$ then, the first – order focal length will be _____.
Ans	✗ A. Equal to f1
	✗ B. Zero
	✗ C. Smaller than f1
	✓ D. Greater than f1

Q.173	**A polymer chain having monomer B branches growing from a main chain of monomer A is known as _____.**
Ans	✗ A. Block copolymer
	✗ B. Statistical copolymer
	✗ C. Alternating copolymer
	✓ D. Graft copolymer

Q.174	**The limit is:** $\lim_{(x,y)\to(0,0)} \frac{xy}{x^2+y^2}$ **is:**
Ans	✓ A. non-existent
	✗ B. exists finitely
	✗ C. 0
	✗ D. exists infinitely

Q.175	**The correct order of hybridization states in C_2H_2, C_2H_4, and C_2H_6 is:**
Ans	✗ A. sp^3, sp^2, sp
	✗ B. sp^2, sp^3, sp
	✗ C. sp^3, sp, sp^2
	✓ D. sp, sp^2, sp^3

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Q.176	**A particle initially moves at 0.6c and its speed is increased to 0.8c. How does its relativistic mass change as observed from the inertial frame?**
Ans	✗ A. It remains the same
	✗ B. It becomes zero
	✓ C. It increases
	✗ D. It decreases

Q.177	**The event 'Prachand Shakti' showcased technology mainly for which branch of the Indian Army?**
Ans	✗ A. Training Command
	✗ B. Medical Corps
	✓ C. Strike Corps
	✗ D. Signals Corps

Q.178	The distance of the point $(3, 4)$ from the line $3x + 4y = 24$ is:
Ans	✗ A. 2/5
	✗ B. 3/5
	✗ C. 4/5
	✓ D. 1/5

Q.179	**Refer to the two statements given below and choose the CORRECT option.** **Statement A: Ionic hydrides are formed mainly with highly electropositive s-block metals.** **Statement B: Ionic hydrides are formed with noble gases.**
Ans	✗ A. Both A and B are true
	✗ B. Both A and B are false
	✓ C. A is true but B is false
	✗ D. A is false but B is true

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Q.180	**The following statements about the E–k diagram are given.** **I. High curvature of curve represents small effective mass.** **II. Small curvature of curve represents small effective mass.** **III. Negative curvature leads to negative effective mass.** **IV. Positive curvature leads to negative effective mass.** **Which combinations are correct for effective mass?**
Ans	✔ A. I, III only
	✘ B. II, III only
	✘ C. I, IV only
	✘ D. II, IV only

Q.181	**An AI classifier predicts spam with 93% accuracy and not – spam with 90% accuracy. 12 % of all emails are spam. If the classifier predicts not – spam, what is the probability that the email is actually spam ?**
Ans	✘ A. 0.030
	✔ B. 0.010
	✘ C. 0.017
	✘ D. 0.023

Q.182	**The BCS theory postulates that the attractive interaction between two electrons, leading to the superconducting state, is mediated by exchange with which quasi-particle?**
Ans	✔ A. Phonon
	✘ B. Exciton
	✘ C. Magnon
	✘ D. Photon

Q.183	**When a 0.01 M aqueous solution of a protein exhibits an osmotic pressure of 0.24 atm at 300 K, while the theoretical value is 0.25 atm, the most plausible reason for this deviation is:**
Ans	✘ A. Solute–solute interactions are negligible
	✘ B. The solution obeys the ideal gas law exactly
	✘ C. Protein molecules undergo dissociation in water

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	✔ D. Solvent–solute interactions lead to association or hydration

Q.184	**As of November 2025, how many development blocks are there in Kangra district, Himachal Pradesh?**
Ans	✘ A. 14
	✘ B. 18
	✘ C. 12
	✔ D. 16

Q.185	**If the refractive indices of the ordinary and extraordinary rays are 1.553 and 1.544, respectively, calculate the least thickness of the plate for which the emergent beam (of wavelength 589 nm) will be circularly polarized.**
Ans	✔ A. 16.4 μm
	✘ B. 16.4 nm
	✘ C. 12.4 μm
	✘ D. 12.4 nm

Q.186	**Which of the following discoveries was made by Johann Wolfgang Dobereiner in 1823?**
Ans	✘ A. Detection of carbon monoxide–steam shift reaction
	✘ B. Liquefaction of common gases at ordinary conditions
	✔ C. Ignition of hydrogen in air over platinum catalyst
	✘ D. Identification of an entire group of inert noble gases

Q.187	**Which of the following monomers is the correct pair for Buna-N rubber?**
Ans	✘ A. Isoprene + Butadiene
	✘ B. Styrene + Butadiene
	✘ C. Chloroprene + Butadiene
	✔ D. Acrylonitrile + Butadiene

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Q.188	**In the formation of BF_3, boron undergoes sp^2 hybridization. Which of the following correctly explains this process?**
Ans	✗ A. Boron uses only unhybridized p orbitals to form three sigma bonds with fluorine atoms.
	✗ B. Two 2p electrons of boron are promoted to higher energy orbitals, forming three sp hybrid orbitals.
	✓ C. One 2s electron of boron is promoted to a vacant 2p orbital, forming three equivalent sp^2 hybrid orbitals.
	✗ D. One 2p electron of boron is promoted to a 3s orbital, forming three sp^2 hybrid orbitals.

Q.189	**निम्नलिखित विकल्पों में से लोकोक्ति के सही अर्थ की पहचान कीजिए।** **'चोरी करने वाला मोरी रखता है।'**
Ans	✗ A. अपराधी बचाव का रास्ता रखता है।
	✗ B. चोरी करने वाला हमेशा अपना कपड़ा दुरुस्त रखता है।
	✓ C. अपराधी साक्ष्य का कोई सुराग नहीं छोड़ता है।
	✗ D. चोरी करने वाला स्त्री प्रेमी भी होता है।

Q.190	**The Maxwell relation from the Helmholtz free energy F = U - TS is _____.**
Ans	✓ A. $\left(\frac{\partial S}{\partial V}\right)_T = \left(\frac{\partial P}{\partial T}\right)_V$
	✗ B. $\left(\frac{\partial S}{\partial P}\right)_T = -\left(\frac{\partial V}{\partial T}\right)_P$
	✗ C. $\left(\frac{\partial T}{\partial P}\right)_S = \left(\frac{\partial V}{\partial S}\right)_P$
	✗ D. $\left(\frac{\partial T}{\partial V}\right)_S = \left(\frac{\partial P}{\partial S}\right)_V$

Q.191	**The world-famous International Kullu Dussehra, where hundreds of local deities assemble for a week-long celebration, is held at which ground?**
Ans	✗ A. Sultanpur Ground
	✓ B. Dhalpur Ground

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	✗ C. Sarvari Ground
	✗ D. Akhara Bazar

Q.192	Which of the following rings is an integral domain?
Ans	✗ A. $\mathbb{Z}_4$ a ring of integers modulo 4.
	✓ B. $\mathbb{Z}_{11}$ a ring of integers modulo 11
	✗ C. $\mathbb{Z}_9$ a ring of integers modulo 9
	✗ D. $\mathbb{Z}_{14}$ a ring of integers modulo 14

Q.193	**Which city serves as the second venue for the sessions of the Himachal Pradesh Legislative Assembly?**
Ans	✗ A. Chamba
	✓ B. Dharamshala
	✗ C. Sundernagar
	✗ D. Solan

Q.194	**Elevation of boiling point occurs because addition of solute:**
Ans	✗ A. Decreases molecular motion in the solvent
	✗ B. Increases condensation rate of the solvent
	✗ C. Raises vapour pressure, reducing temperature
	✓ D. Lowers vapour pressure, requiring more heat

Q.195	**In the series of substituted benzoic acids, which compound will have the lowest pKa value (strongest acid)?**
Ans	✓ A. p-Nitrobenzoic acid
	✗ B. p-Methylbenzoic acid
	✗ C. Benzoic acid
	✗ D. p-Methoxybenzoic acid

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Q.196	**Which of the following is NOT a component of personal guidance?**
Ans	✗ A. Social relationships
	✗ B. Self-understanding
	✗ C. Emotional adjustment
	✓ D. Study habits and examination skills

Q.197	**The distance between the points (1, 1) and (4, 5) is:**
Ans	✗ A. 3
	✗ B. 4
	✓ C. 5
	✗ D. 6

	Comprehension:
	Read the given passage and answer the following questions. Curiosity is a strong desire to learn and explore new ideas. It helps us grow, build better relationships, adapt to change, and innovate. In work life, curiosity stops us from making negative assumptions about others and improves difficult relationships by encouraging open communication. Curiosity also keeps our expertise fresh. As the world changes rapidly, staying curious helps avoid becoming outdated by encouraging continual learning. For example, professionals need to update their knowledge to remain effective. Moreover, curiosity drives innovation by pushing us to explore new fields, ask questions, and connect ideas. Studies show curious employees solve problems creatively and work better in teams. Curiosity challenges certainty—the belief that our opinions are absolute. It opens us to rethink, learn from mistakes, and become lifelong learners. Embracing curiosity benefits our growth, relationships, and success.
	SubQuestion No : 198
Q.198	**Identify the central theme of the passage.**
Ans	✓ A. Igniting growth and innovation through a curious mindset
	✗ B. The history of innovation and invention
	✗ C. The dangers of certainty and curiosity
	✗ D. The importance of perseverance

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	Comprehension:
	Read the given passage and answer the following questions. Curiosity is a strong desire to learn and explore new ideas. It helps us grow, build better relationships, adapt to change, and innovate. In work life, curiosity stops us from making negative assumptions about others and improves difficult relationships by encouraging open communication. Curiosity also keeps our expertise fresh. As the world changes rapidly, staying curious helps avoid becoming outdated by encouraging continual learning. For example, professionals need to update their knowledge to remain effective. Moreover, curiosity drives innovation by pushing us to explore new fields, ask questions, and connect ideas. Studies show curious employees solve problems creatively and work better in teams. Curiosity challenges certainty—the belief that our opinions are absolute. It opens us to rethink, learn from mistakes, and become lifelong learners. Embracing curiosity benefits our growth, relationships, and success.
	SubQuestion No : 199
Q.199	**Identify the correct inference based on the passage.**
Ans	✗ A. Curiosity only helps with relationships
	✓ B. Curiosity prevents stagnation and promotes learning
	✗ C. Curiosity is unnecessary for experts
	✗ D. Curiosity causes confusion and conflict

	Comprehension:
	Read the given passage and answer the following questions. Curiosity is a strong desire to learn and explore new ideas. It helps us grow, build better relationships, adapt to change, and innovate. In work life, curiosity stops us from making negative assumptions about others and improves difficult relationships by encouraging open communication. Curiosity also keeps our expertise fresh. As the world changes rapidly, staying curious helps avoid becoming outdated by encouraging continual learning. For example, professionals need to update their knowledge to remain effective. Moreover, curiosity drives innovation by pushing us to explore new fields, ask questions, and connect ideas. Studies show curious employees solve problems creatively and work better in teams. Curiosity challenges certainty—the belief that our opinions are absolute. It opens us to rethink, learn from mistakes, and become lifelong learners. Embracing curiosity benefits our growth, relationships, and success.
	SubQuestion No : 200
Q.200	**Identify the word that is the closest ANTONYM of 'curiosity'.**
Ans	✗ A. Enthusiasm
	✓ B. Indifference

	C. Interest
	D. Excitement

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