HINTS & SOLUTION

1. *c)* This rare idiom means to foolishly or obsessively pursue a romantic or unrealistic ideal.

2. *b)* "Come a cropper" means to fail badly or fall abruptly, often unexpectedly.

3. *b)* It's an old idiom meaning to stop talking nonsense and focus on what's important.

4. *b)* It means to socially ostracize someone or ignore them completely.

5. *b)* This idiom is used when someone speaks negatively or undervalues what belongs to them.

6. *c)* Sesquipedalian refers to the use of long words or characterized by long words, hence "polysyllabic" is closest.

7. *b)* Peregrinate means to travel or wander from place to place.

8. *c)* Excoriate means to criticize severely or denounce sharply.

9. *d)* Mordant refers to sharp or critical humour, much like Sarcastic.

10. *c)* Recondite means dealing with something little known or obscure, as does esoteric.

11. *c)* Past perfect ("had left") is followed by simple past ("reached")

12. *b)* When subjects are joined by "neither…nor", the verb agrees with the subject closest to it – here, "students" (plural)

13. *a)* "No sooner… than" is the correct correlative pair

14. *c)* "Not only… but also" structure: when inversion occurs in the first clause ("did she win"), normal word order follows in the second.

15. *d)* "Insist on + verb-ing" is the correct construction.

16. *a)* "Despite" is never followed by "of." Correct usage: "Despite being a seasoned diplomat…"

17. *c)* When using "not only… but also," the verb must agree with the nearest subject. "Aides" is plural, so the correct form is: "were involved."

18. *b)* "Who" refers to "few cricketers" (plural), so the verb should be "have played."

19. *b)* "Had" should be followed by the past participle "rung," not "rang." Correct: "had the bell rung."

20. *b)* "Each" is singular, so it takes a singular verb. Correct: "has been asked."

21. *b)* Languages evolve through interaction, not in isolation. "Isolation" contrasts with the ideas of contact and coalescence mentioned in the sentence.

22. *c)* "Syncretic" means blending different schools of thought or cultures—apt for a language formed from diverse influences.

23. *d)* The "trajectory of vocabulary" implies the path or progression over time, aligning with historical changes.

24. *a)* French terms were absorbed or taken in—hence, "assimilated" is the precise fit.

25. *d)* "Protean" implies constant change and versatility—apt for describing dynamic linguistic evolution.

26. *b)* consonance – means harmony or agreement.

27. *c)* lodestar – a guiding principle or reference.

28. *c)* enthymematic – reasoning with implied premises.

29. *b)* dialectical – based on logical argument and contradiction.

30. *c)* erosion – gradual destruction or decline.

31. *c)* "Only" modifies the noun "survivor," functioning adjectivally.

32. *b)* Across shows the relationship between running and field.

33. *b)* Pair is the thing being bought — a noun.

34. *c)* Little limits/quantifies the noun girl.

35. *a)* Because connects reason with action.

36. *c)* Sentence A introduces the event, B explains its root cause, D elaborates on the impact, and C shows institutional response.

37. *b)* D introduces the theme, C defines Nyaya, B gives historical depth, A marks a pinnacle in the tradition.

38. *b)* Chronological order: Concept ©, technical explanation (A), means of testing (D), and final outcome (B).

39. *b)* A introduces administrative structure, B adds moral leadership, D supports with evidence, and C summarizes.

40. *b)* A introduces concept, C explains its philosophical shift, B shows application, D shows the consequence.

41. *c)* The paragraph highlights that Bose's method combined Eastern thought with Western scientific rigor.

42. *c)* The Crescograph was used to measure how plants respond to light, sound, and touch.

43. *b)* The paragraph states Bose's work anticipated the field of plant neurobiology.

44. *b)* Bose proposed that sentience is not binary but a spectrum across lifeforms.

45. c) Bose's contemporaries ridiculed his ideas, showing their skepticism.

46. *c)* "Fringe" refers to ideas once considered unorthodox or outside mainstream science.

47. *c)* The phrase suggests that sentience is not an either-or concept but varies in degree.

48. *b)* Epigenetics is noted as supporting plant memory-like responses to stimuli.

49. *b)* The idea that plants could intelligently respond to stimuli was revolutionary at the time.

50. *c)* The paragraph traces the evolution of ideas about plant sentience from Bose to present-day science.

51. *c)* When the air column resonates with the tuning fork's frequency, the column length equals one-fourth of the wavelength of the sound wave. This results in the loudest sound, indicating resonance at Q.

52. *c)* At points A and C (extremes), velocity is zero and acceleration is directed toward the equilibrium position (point B). At point B (lowest), kinetic energy and tension are maximum. Velocity is perpendicular to the string only at point B, not A or C.

53. *a)* 1, 3, and 4
1. True – Primary cells are designed for single use and are not rechargeable.
2. False – Secondary cells involve redox reactions that are reversible.
3. True – Primary cells are used in low-drain devices (like remotes); secondary cells are for high-drain devices (like laptops, EVs).
4. True – Secondary cells can be recharged and reused multiple times.
5. False – Secondary cells generally have lower internal resistance to deliver higher currents efficiently.

54. *a)* X-rays have shorter wavelengths, can ionize, and penetrate soft tissue. They are electromagnetic waves, like visible light.

55. *c)* Power loss due to resistance is given by i^2R, where i is the current and R is the resistance of the transmission line. By increasing the voltage, the current is reduced for the same power transmission, thereby reducing the resistive losses. Therefore, operating at a higher voltage (220 kV in this case) results in better efficiency as the current is reduced, leading to less power loss.

56. *c)* To compensate for lower external pressure, a heavier valve is needed to maintain higher internal pressure and boiling point.

57. *c)* The Clausius-Clapeyron equation relates pressure and boiling point, explaining why increased pressure raises the boiling point.

58. *c)* Radiation is the only mode of heat transfer in a vacuum. It can slightly warm the nitrogen, causing some evaporation and condensation on nearby surfaces.

59. *b)* Sound pitch is directly proportional to the frequency of vibrations; faster rotation increases frequency, raising pitch.

60. *b)* Impedance mismatch causes signal reflection; matching prevents this for efficient transmission.

61. *b)* The loudness and inflection of speech are translated into amplitude variations in analog signals.

62. *c)* A periscope only reflects light using mirrors; it doesn't have lenses to collect or magnify distant light like a telescope.

63. *c)* A shorter focal length of the objective lens increases magnification but reduces the distance between the sample and lens.

64. *b)* Reflecting telescopes avoid chromatic aberration (color distortion) and support larger apertures for better light gathering.

65. *c)* Nearby iron masses distort the local magnetic field, leading to deviations in compass readings—this is called magnetic deviation.

66. *d)* Sharp points enhance local electric field intensity due to charge accumulation at curved surfaces, making it easier to ionize the surrounding air. This promotes safe and early discharge to the Earth, making the needle-like shape the most effective for lightning conductors.

67. *c)* Low melting point → quick melting
High thermal conductivity → quick heat dissipation when current is low
High resistivity → produces heat faster
Positive temp. coefficient not necessary for fuses (used in thermistors)

68. *b)* Each part has resistance = R/n
In parallel: $R_{eq} = (R/n)/n = R/n^2$

69. *b)* In a balanced Wheatstone bridge, no current flows through the galvanometer. So, zero current through central branch.

70. *c)* The magnetic field only affects the perpendicular component of velocity. The parallel component remains unchanged, leading to helical motion.

71. *d)*

A. The graph between v and u follows the lens formula , which gives a hyperbolic curve. Hence, the graph is correct.
B. For constant object distance u, the lens formula shows that v increases with f. Over a small range, this appears linear, justifying the straight-line graph.
C. As the object distance u increases, the eye lens relaxes, and focal length f increases. So, a positive slope between f and u is accurate.

72. *a)*

1. True, because it has a smaller moment of inertia compared to the ring, so it accelerates faster.
2. False, since they start from the same height but distribute energy differently between rotation and translation.
3. True, as no slipping implies no energy loss due to friction.
4. True, since rotational inertia influences the distribution of energy and hence the acceleration.

73. *d)* The radius of the electron's path increases with higher speed or mass due to the relationship r = mv/qB.

74. *b)* Work is done on a particle only when there is a component of force along its direction of motion. In scenario 1, the force is purely radial and always perpendicular to the particle's displacement, so no work is done. In scenario 2, the presence of a tangential force means there is a component of force along the direction of motion, so work is done. In scenario 3, the net force is always perpendicular to the displacement, so again, no work is done. In scenario 4, a retarding tangential force opposes the motion but still acts along the direction of displacement, resulting in negative work. Therefore, work is done only in scenarios 2 and 4.

75. *c)*

1. **Volume of original solid sphere:**
   $V_{solid} = (4/3)\pi R^3$
2. **Mass of the solid sphere:**
   $M = \rho \times V_{solid} = \rho \times (4/3)\pi R^3$
3. **Volume of the hollow shell:**
   $V_{shell} = (4/3)\pi(R^3 - (R/2)^3)$
   $= (4/3)\pi(R^3 - R^3/8)$
   $= (4/3)\pi(7R^3/8)$
4. **Average mass density of the shell:**
   $\bar{\rho}_{shell} = M / V_{shell}$
   $= [\rho \times (4/3)\pi R^3] / [(4/3)\pi \times (7R^3/8)]$
   $= \rho \times (8/7) = (8/7)\,\rho$

76. *a)* Na comes from Natrium, and Fe from Ferrum.

77. *c)* H_2CO_3: Molar mass = 62; O = 48 → %O = (48/62)×100 ≈ 77.4%, highest among options.

78. *a)* $AlCl_3$ is covalent in vapor phase (forms Al_2Cl_6), not always ionic.

79. *c)* Decomposition of sodium azide is highly exothermic and releases a large volume of N_2 gas rapidly: $2NaN_3 \rightarrow 2Na + 3N_2$

80. *a)*

1. True – N_2 is diatomic with a strong triple bond, highly inert.
2. True – Shows oxidation states: -3 (NH_3), 0 (N_2), +1 to +5 (NO, NO_2, N_2O_5).
3. False – Nitrogen cannot expand octet; no stable NCl_5 due to lack of d-orbitals.
4. True – Oxides include acidic (NO_2, N_2O_5), neutral (N_2O, NO), and amphoteric (rare).
5. True – Used in inert environments due to non-support of combustion.
6. False – N≡N bond has higher bond enthalpy (~941 kJ/mol) than O=O (~498 kJ/mol).

81. *b)*

1. Correct. Nitrogen is used in food packaging to prevent oxidation and bacterial growth.
2. Incorrect. Nitrogen is used for inertness and moisture control, not for molecular weight.
3. Correct. Nitrogen provides an oxygen-free environment for semiconductor processes.
4. Correct. Liquid nitrogen cools biological samples rapidly, but improper handling can damage tissues.
5. Correct. Nitrogen prevents oxidation, but excessive nitrogen can hinder reactions needing oxygen.

82. *a)* Cow dung is not a significant source of calcium; calcium is present in trace amounts, not dominantly as carbonate.

83. *a)*
Statement 1: Correct – Ammonium nitrate is a known oxidizer.
Statement 2: Incorrect – Superphosphate is made by reacting rock phosphate with sulfuric acid.
Statement 3: Correct – Urea hydrolyzes to form ammonia, which can make the soil basic.
Statement 4: Correct – Sylvinite is the raw material for KCl.

84. b) The label shows % by weight of N, P_2O_5, and K_2O, i.e., 10% N, 20% P_2O_5, and 10% K_2O.

85. *c)* Higher transition → higher energy emitted → lower wavelength. As n increases, electron is farther from nucleus, so less energy needed to ionize.

86. *b)* Paschen lies in IR, not visible. Balmer is the only one in visible region.

87. *c)*
1. The mass of an electron is approximately 1836 times less than that of a proton: True. The electron's mass is about $1/1836^{th}$ of the proton's mass.
2. The atomic number of an element is equal to the number of protons in its atom: True. The atomic number defines the number of protons in an atom.
3. The number of protons and neutrons in an atom are always equal for all elements: False. The number of protons is fixed, but the number of neutrons can vary in isotopes.
4. Isotopes of an element have the same number of protons but different numbers of neutrons: True. Isotopes have the same number of protons but differ in neutrons.
5. Electrons in an atom can only exist in specific energy levels, and these energy levels are quantized: True. Electrons exist in discrete, quantized energy levels.

88. *b)* Pigments provide opacity and color; binders form a film and ensure adhesion; solvents adjust viscosity for application.

89. *b)* Antimony trioxide acts as a synergist in fire-retardant systems, especially with halogenated compounds.

90. *c)* Titanium dioxide has a high refractive index (~2.7), making it ideal for brightness and hiding power.
Statement 4 is incorrect: Marie Curie's research focused on radioactivity, but the uncertainty principle was formulated by Werner Heisenberg and is part of quantum mechanics.

91. *c)* Molecular oxygen is released during the photolysis of water in the light-dependent reactions.

92. *c)* The proximal convoluted tubule (PCT) selectively reabsorbs essential substances into the blood.

93. *c)* Albumin is a large protein and is not normally filtered. Its presence indicates glomerular damage.

94. *c)* Cerebellum controls coordination and balance. Consciousness is governed by the cerebrum.

95. *c)* Toxins magnify at each trophic level. Top carnivores like eagles accumulate maximum non-degradable toxins.

96. *b)* Mendel's dihybrid experiments confirmed all three classical Mendelian laws, but incomplete dominance is a non-Mendelian concept.

97. *a)* Epidemics caused by vector-borne diseases (like malaria, dengue) are often associated with poor sanitation (1), and are seasonal in tropical regions (3). They are not controlled by antibiotics (4), as they are transmitted through vectors (2).

98. *c)*
Statement 1 is fully correct.
Statement 2 is incorrect – Vitamin B3 is water-soluble, not fat-soluble.
Statement 3 is fully correct.
Statement 4 is partially incorrect – Cholecalciferol (not ergocalciferol) is the main form in humans.
Statement 5 is mostly correct – though ascorbic acid is the active form, dehydroascorbic acid is acceptable as a minor oxidized form.

99. *a)*
Set A – All Correct
Xylem: true
Smooth muscles: true
Squamous epithelium: true
Set B – Incorrect
Phloem contains both living (sieve tubes, companion cells) and dead cells (phloem fibres)
Striated muscles are not found in internal organs – only in skeletal muscles
Cardiac muscles: true
Set C – Incorrect
Meristematic: true
Collenchyma: pectin and cellulose in corners – correct
Parenchyma: doesn't always contain chloroplasts → only chlorenchyma does
Set D – All Correct
Cartilage: true
Ligaments: true
Tendons: true

100. a)
Statement 1: Correct – Nitrogen fixation is indeed carried out by symbiotic bacteria (like Rhizobium) in the roots of leguminous plants, while nitrification (ammonia → nitrites → nitrates) is performed by chemoautotrophic bacteria.
Statement 2: Correct – The greenhouse effect is enhanced by gases such as water vapor, methane, and CO_2, which absorb infrared radiation and trap heat, leading to global warming.
Statement 3: Incorrect – Deforestation reduces carbon sequestration. Trees store carbon in their biomass, and their removal releases this carbon into the atmosphere, contributing to higher CO_2 levels, not enhancing soil carbon storage.
Statement 4: Correct – Hadley cells (tropical atmospheric circulation) contribute to desertification near 30° latitude (subtropical high-pressure zones) due to descending dry air that reduces moisture, leading to arid conditions.

101. *c)* Formed in 1914 in Germany, it aimed to establish a Provisional Government of Free India with support from Central Powers.

102. *a)* Sarabha was one of the youngest martyrs and inspired Bhagat Singh, who carried his photo in his pocket.

103. *c)* "Ulgulan" (Great Tumult) was led by Birsa Munda in 1899–1900 against colonial forest policies and exploitative landlords.

104. *a)*
Calcutta Session, 1906 (1–D): Presided by Dadabhai Naoroji, adopted Swadeshi, Boycott, and National Education as part of the national movement.
Lucknow Session, 1916 (2–B): Known for the historic Congress-Muslim League Pact allowing separate electorates.
Lahore Session, 1929 (3–A): Presided by Nehru, it officially declared Purna Swaraj (Complete Independence).
Karachi Session, 1931 (4–C): After Gandhi-Irwin Pact, it laid down the first vision of Fundamental Rights and Economic Policy.

105. *a)* The First Plan (1951–56) was based on the Harrod-Domar growth model with a strong focus on agriculture and irrigation due to the food crisis post-independence.

106. *b)* The Janata Government under Morarji Desai introduced the Rolling Plan, which was discontinued after the Congress returned to power.

107. *b)* The economic reforms initiated in 1991 were consolidated during the Eighth Plan period.

108. *b)* The Twelfth Five Year Plan (2012–17) was the final plan under the Planning Commission.

109. *b)* The Jacobins were radical revolutionaries who believed in equality through drastic change, while the Girondins were moderate and cautious reformists.

110. *b)* Rousseau's ideas on general will, popular sovereignty, and natural rights deeply shaped revolutionary ideology.

111. *c)*

1. Tennis Court Oath (June 1789)
2. Storming of Bastille (July 1789)
3. Execution of Louis XVI (Jan 1793)
4. Declaration of Republic (Sept 1792)

112. *b)* In 1789, women marched to Versailles demanding bread and political accountability from the king.

113. *b)* Marxist socialism is grounded in historical materialism and class struggle, while Utopian socialism is more idealistic and cooperative without scientific analysis.

114. *a)* The Industrial Revolution exposed the exploitation of workers, fueling Marx and Engels' critique of capitalism.

115. *c)* Bernstein developed "evolutionary socialism," advocating gradual reforms within democracy.

116. *c)* Scientific socialism uses empirical and historical methods (especially class struggle) to develop socialist theory.

117. *a)* The Bandung Conference in 1955 showcased India as a leader of Afro-Asian solidarity.

118. *b)* "Vasudhaiva Kutumbakam" is an ancient Indian philosophical idea from the Maha Upanishad, guiding India's global ethical outreach.

119. *d)* Nehru's vision of non-alignment shaped India's global identity as a peace-promoting, autonomous power.

120. *c)* Though nuclear policy is strategic, India's declared NFU doctrine echoes Gandhi's principle of responsible and ethical state conduct.

121. *b)* The standard sea-level pressure is 1013.25 hPa (hectopascals), or 1 atmosphere.

122. *b)* Pressure drops to half at roughly 5.5 km due to the exponential decrease of pressure with height.

123. *c)* Water vapor is the most abundant greenhouse gas and crucial in regulating Earth's surface temperature.

124. *a)* In Hadley Cell, warm equatorial air rises (low pressure), and cold air descends in subtropics (high pressure).

125. *c)* When dew point and air temperature are close, relative humidity is high, and air is nearly saturated.

126. *b)* Specific humidity remains constant with altitude, but relative and absolute humidity vary with temperature and volume, respectively.

127. *b)* A sling psychrometer uses wet and dry bulb readings to calculate relative humidity.

128. *c)* Condensation releases latent heat, which provides energy for convection and cloud development.

129. *c)* Frontal precipitation occurs when warm and cold air masses meet, especially in mid-latitude cyclones.

130. *c)* When temperature = dew point, RH = 100%. Air is saturated, and condensation may occur, leading to cloud formation or precipitation.

131. *c)* Drizzle is fine liquid rain, while sleet occurs when raindrops freeze before reaching the ground.

132. *b)* As air descends, it compresses and warms adiabatically; having lost moisture on the windward side, it becomes dry (rain shadow effect).

133. *a)* This is the correct sequence from foothills to higher altitudes in the Western Himalayas.

134. *a)* Western Ghats are a biodiversity hotspot with numerous endemic species like the Malabar civet, Lion-tailed macaque, and rare tree species.

135. *a)* Alpine forests occur above 3000m, not below 1500m. Moist deciduous forests and xerophytes are correctly matched.

136. *c)* Epiphytes like orchids and ferns are characteristic of moist evergreen forests, which thrive in high rainfall zones.

137. *d)* It is rich in minerals like coal and iron ore, supporting core industries like steel, cement, and thermal power.

138. *a)* Kazakhstan produces over 40% of the world's uranium through in-situ leaching methods.

139. *b)* Koraput district is rich in laterite rocks, making it a bauxite-rich zone ideal for aluminium industry.

140. *c)* Bailadila hills in Dantewada district have some of the best quality hematite iron ore in the world.

141. *b)* Jiroft is in Iran, not Turkey — Incorrect
Tel Megiddo and Pompeii discoveries are accurately matched

142. *a)* Srishti Khandagale became the first Indian to medal in the Asian Trampoline Gymnastics Championships, earning silver in the Women's Individual Age group in Hong Kong.

143. *d)* The 'Shiksha Sahayak Yojana' was introduced to enhance the quality of education in rural areas by setting up digital classrooms. Other options, while relevant to education, are not part of the 2025 initiative for rural areas.

144. *c)* The 2025 "Jana Jatiya Parampara Utsav" focused on showcasing traditional art, dance, and crafts of PVTGs across India.

145. *c)* This 2025 documentary highlighted the spiritual and ritualistic dimensions of Pithora painting by the Rathwa and Bhil tribes.

146. *c)* Bali hosted the International Ramayana Conference in 2025, showcasing shared cultural roots between India and Southeast Asia.

147. *c)* Recognized for philosophical and theological contributions in Sanskrit.

148. *c)* He was honored for promoting environmental consciousness through a spiritual lens.

149. *c)* NDA – Seva Parmo Dharma, IMA – Valour and Wisdom, OTA –. Serve With Honour

150. *a)* The year 2026 has been declared by the United Nations as the International Year of the Woman Farmer, and also as the International Year of Rangelands and Pastoralists.