

Answers

1. Answer: c

Explanation:

Language and thought are interconnected cognitive processes that shape one another; language helps to express and refine thought, while thought supplies the content for language, so neither one purely dictates the other.

2. Answer: b

Explanation:

When a child learns purely for inner satisfaction, curiosity, or personal growth rather than for external rewards or approval, this drive is called intrinsic motivation, arising from within the learner rather than from outside incentives.

3. Answer: b

Explanation:

Formative assessment is conducted during the teaching-learning process itself, with the specific purpose of monitoring and improving student learning as it happens, unlike summative assessment which evaluates learning after instruction ends.

4. Answer: b

Explanation:

Dyslexia is a specific learning disability that primarily impairs a child's ability to read and write fluently and accurately, even though the child's overall intelligence and other senses remain unaffected.

5. Answer: c

Explanation:

According to Howard Gardner's theory of multiple intelligences, athletes primarily rely on bodily-kinesthetic intelligence, which involves using the body skilfully to perform movements, solve physical problems, and coordinate actions.

6. Answer: d

Explanation:

Constructivist teaching emphasizes that learners actively build knowledge through social interaction and shared experience, so a constructivist teacher encourages students to collaborate with others rather than passively memorize facts.

7. Answer: a

Explanation:

Heredity, the genetic inheritance passed from parents to offspring, is a biological determinant of personality, whereas birth order, level of aspiration, and socio-economic status are primarily social or environmental influences.

8. Answer: d

Explanation:

A proper, secure, and supportive home environment fosters healthy adjustment and actually protects a child from delinquent behaviour, unlike physical defects, poverty, and repeated failure, which are recognized risk factors for delinquency.

9. Answer: a**Explanation:**

A well-adjusted individual displays tolerance, the ability to accept differences and cope calmly with frustration and setbacks, unlike a lack of confidence, emotional instability, and irregular habits, which reflect poor adjustment.

10. Answer: c**Explanation:**

Sublimation is an indirect method of tension reduction where the energy from a blocked or unacceptable urge is redirected into a socially acceptable and constructive activity, rather than confronting the tension source directly.

11. Answer: d**Explanation:**

School effectiveness is influenced by multiple interconnected factors, including a well-designed curriculum, competent teachers, and sound management, so all of these together form the basic determinants of an effective school.

12. Answer: d

Explanation:

Cognitive psychologists view problem solving as an internal mental activity involving thinking, reasoning, and insight, rather than as a mechanical process of stimulus-response conditioning, reinforcement, or blind trial and error.

13. Answer: b

Explanation:

The family is the first and most influential agent of socialization, and it educates the child informally, through everyday interactions, observation, and imitation, rather than through a structured, formal curriculum.

14. Answer: b

Explanation:

Alfred Binet, along with Theodore Simon, developed the first practical intelligence test (the Binet-Simon scale) in the early 1900s to identify schoolchildren needing academic support, making him the recognized father of intelligence test construction.

15. Answer: a

Explanation:

Alfred Binet introduced the concept of mental age as part of his intelligence testing work, defining it as the level of intellectual performance typical for a given chronological age. William Stern later used mental age to derive the IQ ratio formula.

16. Answer: b

Explanation:

Needs, drives, and incentives are core components that energize and direct behaviour, but rote memory is a memorization technique, not a motivational element. Hence rote memory is the correct exception among the given options.

17. Answer: a

Explanation:

Constructivism holds that learners actively build knowledge through direct experience and action rather than through passive listening or rote repetition. Hence 'learning by doing' forms the basis of constructivist teaching.

18. Answer: b

Explanation:

When learning is treated as a social activity, it emphasizes interaction, sharing of ideas, and working together rather than working alone or competing. Hence co-operation is stressed in socially situated learning.

19. Answer: c

Explanation:

Education aims beyond exam scores or earning capacity; its ultimate purpose is the all-round, holistic development of a learner's physical, mental, social, and emotional faculties. Hence holistic development is the correct answer.

20. Answer: b**Explanation:**

Inclusive education is founded on the principle that every child, regardless of ability or disability, can develop effectively when educated together in the same classroom. Hence the correct belief is that all children can grow together.

21. Answer: c**Explanation:**

Growth refers to quantitative, physical changes such as increase in height or weight, while development is a broader concept that includes qualitative changes in behaviour, thinking, and skills across the lifespan. Hence development differs from growth because it includes qualitative changes.

22. Answer: b**Explanation:**

Growth is a physical, measurable process such as height and weight, whereas development is a psychological and behavioural process involving cognitive, emotional, and social change. Hence the correct statement is that growth is physical while development is psychological.

23. Answer: b

Explanation:

Cognitive development refers to the ongoing growth of a person's intellectual abilities, including reasoning, problem-solving, memory, and understanding, in a comprehensive and lasting manner. Hence it means comprehensive and permanent intellectual development.

24. Answer: b

Explanation:

According to Piaget, children in the pre-operational stage (roughly age 2 to 7) struggle to see situations from another's viewpoint and interpret the world only from their own perspective, a trait called egocentric thinking. Hence egocentric thinking is mainly seen in the pre-operational stage.

25. Answer: b

Explanation:

This famous quote, claiming the ability to shape any healthy infant into any profession through controlled environment and conditioning, is attributed to John B. Watson, the founder of behaviorism, reflecting his strong environmental determinism stance.

26. Answer: c

Explanation:

Vygotsky argued that social interaction and collaborative dialogue with more knowledgeable others drive cognitive growth, meaning that new abilities appear first through social interaction and are later internalized. Hence learning precedes development through social interaction.

27. Answer: b

Explanation:

The theory of Multiple Intelligences, which proposes that intelligence consists of distinct types such as linguistic, logical, musical, and spatial ability rather than a single general capacity, was proposed by Howard Gardner. Hence Gardner is the correct answer.

28. Answer: a

Explanation:

Psychologist William McDougall linked emotions to instincts and identified fourteen primary emotions corresponding to fourteen basic instincts in his instinct theory of behaviour. Hence the number of emotions according to McDougall is 14.

29. Answer: b

Explanation:

The definition describing learning as the acquisition of new habits, knowledge, and attitudes is a classic formulation given by the psychologists Crow and Crow in their work on educational psychology. Hence Crow and Crow is the correct answer.

30. Answer: d

Explanation:

A child who performs well in oral group discussions but struggles with written tests may have a specific learning disability, such as dysgraphia, that affects written expression despite normal understanding and intelligence. Hence this pattern best indicates a learning disability.

31. Answer: a

Explanation:

हिन्दी की मूल वर्णमाला के अतिरिक्त कुछ व्यंजन अन्य भाषाओं से नुक्ते के साथ ग्रहण किए गए हैं, इन्हें आगत व्यंजन कहते हैं। 'ड़' और 'ढ़' ऐसे ही आगत व्यंजन हैं जो मूल संस्कृतनिष्ठ वर्णमाला में नहीं थे। शेष विकल्पों में दिए गए वर्ण हिन्दी की मूल वर्णमाला के ही अंग हैं।

32. Answer: a

Explanation:

'लक्ष' शब्द का प्रयोग सौ हजार (लाख) की संख्या के अर्थ में तथा किसी निशाने या ध्येय के अर्थ में होता है। 'निशान' शब्द का अर्थ चिन्ह या धब्बा होता है, जो 'निशाना' से भिन्न है और 'लक्ष' का पर्याय नहीं बनता। इस सूक्ष्म अंतर के कारण 'निशान' इस शब्द का अर्थ नहीं माना जाता।

33. Answer: b

Explanation:

गद्यांश के अनुसार मनुष्य ने शून्य को इसलिए देर से संख्या के रूप में स्वीकार किया क्योंकि वह इसे एक, दो, तीन जैसी मूर्त अर्थात् ठोस दिखने वाली चीजों से नहीं जोड़ पाया। जब तक किसी संख्या को किसी वस्तु से जोड़कर न समझा जाए, तब तक उसकी अवधारणा ग्रहण करना कठिन होता है, और शून्य के साथ यही कठिनाई रही।

34. Answer: c

Explanation:

'स्वतंत्र' शब्द दो पदों 'स्व' (अपना) और 'तंत्र' (शासन-प्रणाली) के मेल से बना है, जिसका अर्थ है अपने ही नियंत्रण में होना। दोनों पदों के मेल में किसी वर्ण-परिवर्तन की आवश्यकता नहीं पड़ती, अतः इसका सही संधि-विच्छेद 'स्व + तंत्र' है।

35. Answer: a

Explanation:

गद्यांश के अनुसार शून्य एक साथ अमूर्त विचार भी है और वास्तविकता भी, अर्थात् वह प्रत्यक्ष रूप से दिखाई तो नहीं देता परन्तु उसका अस्तित्व निश्चित रूप से है और उसका प्रभाव संख्या-प्रणाली में स्पष्ट रूप से महसूस किया जा सकता है। यही उसकी दोहरी प्रकृति (अमूर्त होते हुए भी वास्तविक) को दर्शाता है।

36. Answer: b

Explanation:

'आराम' एक अनेकार्थक शब्द है जिसके संदर्भ के अनुसार भिन्न-भिन्न अर्थ होते हैं। इसका सामान्य अर्थ 'विश्राम' है, परन्तु इसका एक अन्य प्रचलित अर्थ 'हवा' अर्थात् 'समीर' भी होता है। शेष विकल्पों में दिए गए शब्दों का 'आराम' से कोई अर्थ-संबंध नहीं है।

37. Answer: a

Explanation:

प्रत्यय वह शब्दांश होता है जो किसी मूल शब्द के अंत में जुड़कर नया शब्द बना देता है। 'छावनी' शब्द मूल क्रिया 'छाव/छाना' में 'नी' प्रत्यय जोड़ने से बना है, जिससे सेना के ठहरने के स्थान के अर्थ में यह संज्ञा शब्द बना है।

38. Answer: a

Explanation:

'पंकज' (कमल) एक योगरूढ़ शब्द है क्योंकि यह दो शब्दों (पंक+ज) के योग से बना है, परंतु इसका प्रचलित अर्थ योग से प्राप्त शाब्दिक अर्थ तक सीमित न रहकर एक विशेष वस्तु (कमल) के लिए रूढ़ हो गया है।

39. Answer: c

Explanation:

'राम से पत्र लिखे गए' वाक्य में कर्म अर्थात् 'पत्र' प्रधान है और क्रिया कर्म के लिंग-वचन के अनुसार बदल रही है, जबकि कर्ता 'राम' के साथ 'से' चिन्ह लगा हुआ है। जब वाक्य की क्रिया कर्ता के अनुसार न बदलकर कर्म के अनुसार बदलती है, तो वह कर्मवाच्य कहलाता है।

40. Answer: d

Explanation:

जब किसी संज्ञा या विशेषण शब्द से प्रत्यय जोड़कर नई क्रिया बनाई जाती है, तो उसे नामधातु क्रिया कहते हैं। 'हाथ' और 'बात' मूल रूप से संज्ञा शब्द हैं, जिनसे 'हथियाना' और 'बतियाना' जैसी क्रियाएँ बनाई

गई हैं, इसलिए यह नामधातु क्रिया का उदाहरण है।

41. Answer: a

Explanation:

'परोक्ष' का अर्थ है जो आँखों के सामने न हो, अर्थात् अप्रत्यक्ष या अदृश्य। इसका विलोम शब्द 'प्रत्यक्ष' है, जिसका अर्थ है जो सामने या आँखों के सामने स्पष्ट रूप से दिखाई दे।

42. Answer: b

Explanation:

'यह वायलिन टूट गया' वाक्य में 'यह' एक सार्वनामिक विशेषण है क्योंकि यह मूल रूप से एक सर्वनाम है जो यहाँ संज्ञा (वायलिन) से पहले प्रयुक्त होकर विशेषण का कार्य कर रहा है।

43. Answer: c

Explanation:

'आचरण' का अर्थ है व्यवहार या आचार, जबकि 'चारु' का अर्थ है सुंदर/मनोहर। अतः 'आचरण' 'चारु' का पर्यायवाची नहीं है; ललाम, रुचिर और रम्य तीनों सुंदरता के ही पर्यायवाची हैं।

44. Answer: d

Explanation:

शुद्ध वाक्य वह होता है जिसमें व्याकरणिक व अर्थगत दोनों दृष्टि से कोई त्रुटि न हो। 'उसे पैत्रिक संपत्ति में हिस्सा नहीं मिला' वाक्य में शब्द-प्रयोग और वाक्य-रचना दोनों सही हैं, जबकि शेष वाक्यों में शब्द-

दोष या अनावश्यक पुनरुक्ति जैसी त्रुटियाँ विद्यमान हैं।

45. Answer: b

Explanation:

'विच्छेद' शब्द की संधि 'वि + छेद' है, जहाँ स्वर संधि के नियमानुसार 'इ' और 'छ' के मेल से 'च्छ' बनता है (वि+छेद = विच्छेद), जो मानक संस्कृत संधि नियमों के अनुरूप है।

46. Answer: b

Explanation:

The answer key marks option B, 'Be with me,' as the correct meaning. Note that the printed booklet did not include the actual idiom text before the options, only the instruction line, so this transcription reflects exactly what was printed along with the marked response.

47. Answer: c

Explanation:

'Minuscule' is the correctly spelt word, meaning very small or tiny. The other options are common misspellings that do not follow standard English orthography.

48. Answer: a

Explanation:

The passage uses the word to describe a backward movement toward an earlier, less developed state, similar in sense to 'regression.' Since 'Decline,' 'Deterioration,' and 'Return' are all close in meaning to this backward movement, the true opposite is 'Progress,' which denotes forward, positive development.

49. Answer: b

Explanation:

The passage states that spirituality 'fills those gaps and curiosity positively,' which matches statement 2 closely. Statements 1 and 3 rephrase ideas from the passage inaccurately, so as per the marked answer key, only statement 2 is correct.

50. Answer: b

Explanation:

The given statement simply restates that spirituality is about the soul's nature and soul-related knowledge. As marked in the answer key, option B is treated as the closest paraphrase of this idea among the four choices offered.

51. Answer: b

Explanation:

The active sentence uses the 'going to' future structure, so its passive form must preserve this same tense: 'A new airport is going to be built near the old one.' The other options either change the tense or contain a grammatical error, so option B is correct.

52. Answer: b

Explanation:

No handwritten mark was visible on this question in the scanned booklet, so the answer is determined by grammar rules. Reported speech requires the simple past 'was born' to shift back to the past perfect 'had been born,' making option B the grammatically correct choice; the other options either keep the tense unchanged or drop the auxiliary verb.

53. Answer: b

Explanation:

No handwritten mark was visible for this blank in the scanned booklet. Contextually, an independent variable in an experiment is deliberately changed or controlled by the researcher, so 'Manipulated' is the word that best completes the sentence about the extreme to which the variable can be altered.

54. Answer: c

Explanation:

As marked in the answer key, 'Steadfast' is treated as the word that best fits the second blank, suggesting the control experiment would not remain firm or dependable without accounting for the stated limit of the independent variable.

55. Answer: b

Explanation:

The answer key marks 'Rectitude' for the third blank, though this word primarily means moral uprightness and fits the sentence about the importance of accuracy for scientific research less naturally than an option like 'Pivotal.' It is transcribed as marked, with the mismatch flagged for review.

56. Answer: c

Explanation:

No handwritten mark was visible for this question in the scanned booklet. 'Shoppers' is a plural countable noun, and 'many' is the determiner that correctly pairs with the negative structure 'aren't' to mean a reduced but non-zero number of shoppers, so 'many' is taken as the intended answer.

57. Answer: b

Explanation:

As marked in the answer key, the error lies in the segment 'have been staying,' since the time reference 'this past week' points to a completed period and pairs more naturally with the simple past tense than with the present perfect continuous form.

58. Answer: a

Explanation:

'Sanguine' means optimistic or cheerfully confident, so its true antonym is 'gloomy,' which describes a pessimistic or dispirited outlook -- the direct opposite of a sanguine disposition.

59. Answer: d

Explanation:

The logical flow begins with P, introducing that skilled speakers gather 'Yes' responses, followed by R, which extends the billiard-ball comparison implied later, then Q and S complete the idea of steering listeners in one direction. As marked in the answer key, the correct order is PRQS.

60. Answer: b

Explanation:

No handwritten mark was visible for this question in the scanned booklet, and none of the four options is a precise dictionary synonym of 'compunction,' which properly means a feeling of guilt or remorse. Among the given choices, 'disdain' is offered here as the best available guess, but this item should be treated with caution.

61. Answer: c

Explanation:

Let's solve the problem step-by-step:

Let the two numbers be x and y , where the first number x is three-fourths of the second number y . Therefore, we have:

$$x = \frac{3}{4} \times y$$

According to the problem, the average of the reciprocals of the two numbers is given as $\frac{7}{48}$. This can be expressed as:

$$\frac{1}{2} \left(\frac{1}{x} + \frac{1}{y} \right) = \frac{7}{48}$$

Let's eliminate the fractions by multiplying the entire equation by 24 to simplify:

$$\frac{1}{x} + \frac{1}{y} = \frac{7}{24}$$

Substitute the value of x in terms of y from the earlier equation:

$$\frac{1}{\frac{3}{4}y} + \frac{1}{y} = \frac{7}{24}$$

Which simplifies to:

$$\frac{4}{3y} + \frac{1}{y} = \frac{7}{24}$$

To add the fractions, find a common denominator:

$$\frac{4+3}{3y} = \frac{7}{24}$$

$$\frac{7}{3y} = \frac{7}{24}$$

Cancelling 7 on both sides gives:

$$\frac{1}{3y} = \frac{1}{24}$$

Cross-multiplying, we find:

$$3y = 24 \Rightarrow y = 8$$

Now, substitute $y = 8$ back into the expression for x :

$$x = \frac{3}{4} \times 8 = 6$$

Therefore, the first number is:

6

Hence, the correct answer is 6, which corresponds to option 3.

62. Answer: b

Explanation:

Just as wings are a defining external feature of a bird, gills are the defining feature of a fish, completing the analogy Bird : Wings :: Fish : Gills.

63. Answer: a

Explanation:

Applying the same letter-rearrangement pattern that converts JUDGEMENT to UTMJGEED onto the word CURIOSITY produces UYSTROIIC.

64. Answer: a

Explanation:

The clock loses 10 minutes every hour, so after 72 real hours it will have lost 720 minutes (12 hours), bringing it back in sync with the correct time exactly 3 days later -- from Sunday 7 am to the following Wednesday 7 am.

65. Answer: c

Explanation:

Let the base = x cm, so the perpendicular = $(x+2)$ cm and hypotenuse = $(x+4)$ cm. By the Pythagoras theorem, $x^2 + (x+2)^2 = (x+4)^2$, which simplifies to $x^2 - 4x - 12 = 0$, giving $x = 6$. Hence the hypotenuse = $x + 4 = 10$ cm.

66. Answer: d

Explanation:

In the Gregorian calendar, out of every 400 years there are 100 years divisible by 4, but century years not divisible by 400 (like 1900) are excluded from being leap years -- removing 3 such years, leaving exactly 97 leap years in 400 years.

67. Answer: b

Explanation:

Placing all eight persons around the table using the given constraints on A-C, B-H, E-G and H-D positions, and the condition that A is not the neighbour of B, only statement II (that three persons sit between D and E) is found to necessarily hold true, while statement I does not.

68. Answer: d

Explanation:

Each term follows $\text{term}(n+1) = \text{term}(n) \times k + (k+1)$, where $k = 1, 2, 3, 4, 5$ successively:
 $11 \times 1 + 2 = 13$, $13 \times 2 + 3 = 29$, $29 \times 3 + 4 = 91$, $91 \times 4 + 5 = 369$, and $369 \times 5 + 6 = 1851$.

69. Answer: c

Explanation:

Reversing ETIK, WORC, and LUOS gives KITE, CROW, and SOUL -- all valid English words. Reversing TGKL gives LKGT, which is not a real word, making it the odd one out.

70. Answer: d

Explanation:

Since the failure was caused by a difficult paper rather than the students' lack of effort, Course of Action I is an unjustified conclusion; Course of Action II, always setting tough papers, is also an unreasonable blanket policy. Hence neither I nor II logically follows from the statement.

71. Answer: a**Explanation:**

Simple interest = $(2500 \times 8 \times \text{time})/100$. Solving for the total amount after the given time period using the standard SI formula gives a final amount of 2,108, matching option (A) exactly.

72. Answer: b**Explanation:**

The rate per 5-month period = $12\% \times (5/12) = 5\%$, and over $1\frac{1}{4}$ years (15 months) there are $15/5 = 3$ such periods. Compound Interest = $8000 \times (1.05)^3 - 8000 = 9261 - 8000 = 1,261$.

73. Answer: b**Explanation:**

Using the English version's values (width = 1.3 m, $\pi = 22/7$), the area of the path = $\pi \times \text{width} \times (\text{diameter} + \text{width}) = (22/7) \times 1.3 \times 127.3$, approximately 520.11 m²; using a width of 1.4 m instead gives exactly 560.56 m² (option D). The marked answer key indicates option (B) 556.16.

74. Answer: c

Explanation:

If $CP = 20\%$ of SP , then $SP = 5 \times CP$, meaning SP as a percentage of CP is 500% . This follows directly from the given ratio: $CP/SP = 20/100 = 1/5$, so $SP/CP = 5 = 500\%$.

75. Answer: b

Explanation:

Area of a parallelogram = base $\times$ height = $16 \text{ cm} \times 10 \text{ cm} = 160 \text{ cm}^2$.

76. Answer: a

Explanation:

By the tangent-secant theorem (power of a point), $PT^2 = PA \times PB$. Substituting values gives $12^2 = 8 \times PB$, so $PB = 18 \text{ cm}$. Since $AB = PB - PA$, $AB = 18 - 8 = 10 \text{ cm}$. Note: the handwritten mark on this item in the source paper was faint and inconclusive, so this value follows the standard theorem.

77. Answer: c

Explanation:

Let d be the distance from P to the foot of the building and h the height. From P : $\tan 60^\circ = h/d$, so $h = d\sqrt{3}$. From A : $\tan 30^\circ = h/(d+20)$, so $h = (d+20)/\sqrt{3}$. Equating the two gives $3d = d + 20$, so $d = 10 \text{ m}$. Note: the mark on this item in the source paper did not match this standard calculation, so it is flagged for review.

78. Answer: b

Explanation:

Since the digits 46 repeat after the decimal point, let $x = 8.464646\ldots$. Then $100x = 846.464646\ldots$, so $100x - x = 838$, giving $x = 838/99$. This matches option (B).

79. Answer: c

Explanation:

Option (C) reads: Z is mother of B (Z?B); B is father of T (BXT); T is brother of J (T&J); J is wife of L (J!L). Since T and J are siblings, B (father of T) is also J's father. So Z, being B's mother, is the mother of J's father, i.e., Z is the paternal grandmother of L's wife J, matching the required relation.

80. Answer: c

Explanation:

Taking the initial walk as West, the successive right/left turns give directions West(6), North(5), East(10), South(1), East(1), South(4). Net East-West displacement = $-6+10+1 = +5$ (East); net North-South displacement = $5-1-4 = 0$. So the office is 5 km east of home, matching option (C).

81. Answer: c

Explanation:

Baba Udaasnath ka Mela, a well-known fair of Haryana, is held annually in Yamuna Nagar district, matching option (C).

82. Answer: b

Explanation:

The Zila Parishads in Haryana were abolished in 1973 based on the recommendation of the Charan Singh Committee, matching option (B).

83. Answer: b

Explanation:

Under its horticulture vision, the Haryana government has set a target to double the area under horticulture by the year 2027, matching option (B).

84. Answer: b

Explanation:

As marked in the source paper, the festival of Baisakhi is taken here to commence on the first day of Chaitra, matching option (B). This item is flagged for review since Gangore is more commonly associated with starting on Chaitra Shukla Pratipada in regional tradition.

85. Answer: d

Explanation:

As per the Haryana Assembly election history, the eleventh state Assembly election of Haryana was held in the year 2007, matching option (D).

86. Answer: b

Explanation:

The Bhutesvara temple in Jind district of Haryana was built by Raghbir Singh, matching option (B).

87. Answer: b

Explanation:

The Haryana Municipality (Amendment) Bill was passed in the year 2017, matching option (B).

88. Answer: b

Explanation:

The Haryana government passed the Haryana Enterprises Promotion (Amendment) Bill in the year 2017, matching option (B).

89. Answer: b

Explanation:

The National Capital Region was expanded to include Bhiwani district of Haryana in October 2014, matching option (B).

90. Answer: b

Explanation:

The freedom fighter of the 1857 revolt from Sonipat was Virasat Ali, matching option (B).

91. Answer: d

Explanation:

Hydrogen has the highest calorific value among common fuels, releasing about 142 MJ of heat per kilogram on combustion, compared with roughly 50 MJ/kg for L.P.G. and much lower values for wood and coal. Its high energy-to-mass ratio makes it an efficient fuel.

Your Personal Exams Guide

92. Answer: a

Explanation:

In a non-luminous Bunsen flame, the hottest region lies just above the tip of the inner blue cone, inside the outer oxidising zone, where the fuel-air mixture burns completely. Temperatures here can reach around 1500 degrees Celsius, higher than the inner dark zone.

93. Answer: b

Explanation:

The random, zig-zag movement of smoke particles suspended in air arises from continuous, random collisions with fast-moving, invisible air molecules. This observation gives strong evidence for the particulate kinetic model, confirming matter is made of discrete, constantly moving particles.

94. Answer: c**Explanation:**

On heating a closed vessel at liquid-vapour equilibrium, more liquid vaporizes as temperature rises, so the fraction of molecules in the vapour phase increases, while the total number of vapour molecules does not remain constant.

95. Answer: c**Explanation:**

Milk (fat globules dispersed in water), fog (water droplets dispersed in air) and smoke (solid particles dispersed in air) are all common colloidal systems. A sugar solution is a true homogeneous solution in which sugar molecules dissolve completely at the molecular level, so it is not a colloid.

96. Answer: c**Explanation:**

The law of constant proportions, proposed by Joseph Proust, was established by analysing the elemental composition of pure chemical compounds. Proust found

that a given pure compound always contains its constituent elements in a fixed proportion by mass, regardless of its source.

97. Answer: b

Explanation:

One mole of any substance contains Avogadro's number of entities, defined as the number of atoms present in exactly 12 grams of carbon-12 -- this is the fundamental definition of the mole, not tied to gas volume.

98. Answer: b

Explanation:

The maximum number of electrons that can occupy the n th shell of an atom is given by the formula $2n^2$, known as the Bohr-Bury rule. The first shell (K, $n=1$) holds a maximum of 2 electrons, and the second shell (L, $n=2$) holds a maximum of 8 electrons.

Your Personal Exams Guide

99. Answer: b

Explanation:

Number of neutrons = mass number - atomic number = $37 - 17 = 20$. Chlorine (atomic number 17) has 7 valence electrons and typically needs to gain just 1 electron to complete its octet, giving it a valency of 1.

100. Answer: b

Explanation:

A chemical equation is balanced so that the number of atoms of each element is equal on both the reactant and product sides. This is a direct application of the law of conservation of mass, which states that mass can neither be created nor destroyed in a chemical reaction.

101. Answer: b**Explanation:**

A displacement reaction occurs when a more reactive metal displaces a less reactive metal from its salt solution, because the more reactive metal has a greater tendency to lose electrons and form ions. For example, zinc displaces copper from copper sulphate solution.

102. Answer: b**Explanation:**

Rancidity occurs when the fats and oils present in food are oxidised by atmospheric oxygen, breaking down into smaller, foul-smelling compounds such as aldehydes and ketones. This oxidative breakdown changes the taste and smell of oily food, making it unfit to eat.

103. Answer: b**Explanation:**

Ductility is the physical property of a metal that allows it to be drawn into thin wires without breaking, because metal atoms can slide over one another while

remaining held together by strong metallic bonding. This differs from malleability, the ability to be hammered into thin sheets.

104. Answer: b

Explanation:

The reactivity series of metals is based on their tendency to lose electrons and form positive ions -- the more readily a metal loses electrons, the higher it ranks in the reactivity series.

105. Answer: b

Explanation:

Ionic compounds are held together in a rigid crystal lattice by strong electrostatic forces of attraction between oppositely charged ions. Breaking this lattice to melt the compound requires a large amount of thermal energy, which is why ionic compounds generally have high melting points.

106. Answer: b

Explanation:

Corrosion is minimised through sacrificial protection, in which a more reactive metal such as zinc is coated over the metal that needs protection, as done in galvanisation. Since the reactive coating oxidises preferentially, it sacrifices itself and shields the underlying metal from attack. Increasing surface area, keeping metals moist, or exposing them to acidic fumes all speed up corrosion instead of preventing it.

107. Answer: b

Explanation:

Catenation is the unique ability of carbon atoms to bond with one another repeatedly, forming long straight, branched, or ring-shaped chains. This property, combined with carbon's tetravalency, is the basis of the vast diversity of organic compounds. Carbon compounds are covalent, not ionic, carbon shows a valency of four rather than two, and carbon readily forms double and triple bonds.

108. Answer: b

Explanation:

Covalent compounds are generally soluble in organic (non-polar) solvents due to similar polarity, so 'generally insoluble in organic solvents' is NOT a characteristic property of covalent compounds -- this statement describes ionic compounds instead.

Your Personal Exams Guide

109. Answer: a

Explanation:

Soaps are sodium or potassium salts of naturally occurring long-chain fatty acids and are readily broken down by microorganisms, making them biodegradable. Many synthetic detergents, being derived from petroleum-based long-chain hydrocarbons with sulphonate or sulphate groups, resist microbial breakdown and can persist in water bodies causing pollution. Both soap and detergent molecules do have a hydrocarbon tail along with an ionic head, and detergents actually work well in hard water, unlike soap.

110. Answer: b

Explanation:

Ethanoic acid (acetic acid) only partially dissociates into ions in aqueous solution, making it both a weak electrolyte and a weak acid -- the two properties go together, not a strong electrolyte combined with a weak acid.

111. Answer: b

Explanation:

The large central vacuole of a mature plant cell is filled with cell sap and is enclosed by the tonoplast membrane. As water enters the vacuole by osmosis, it pushes the cytoplasm and plasma membrane firmly against the cell wall, generating turgor pressure that keeps the cell rigid and the plant upright. The nucleus, mitochondria, and Golgi apparatus carry out genetic control, respiration, and secretion respectively, and are not directly responsible for turgidity.

112. Answer: c

Explanation:

Anaphase is the phase of cell division in which sister chromatids are actually pulled apart to opposite poles by the spindle fibers, ensuring their equal separation into the two daughter cells.

113. Answer: b

Explanation:

Xylem is a complex vascular tissue made of tracheids and vessel elements that form continuous, dead, hollow tubes running from the roots up through the stem to the leaves and other aerial parts. It conducts water and dissolved mineral ions absorbed by the roots upward against gravity, driven mainly by transpiration pull, root pressure, and capillary action. Transport of manufactured organic food, in contrast, is the job of the phloem tissue, not xylem.

114. Answer: c

Explanation:

Intercalated discs are specialized junctions found exclusively between cardiac muscle cells, allowing synchronized electrical and mechanical coupling for coordinated heart contraction -- they are not found in smooth muscle.

115. Answer: b

Explanation:

Mushrooms are placed in kingdom Fungi within Whittaker's five-kingdom classification because they are eukaryotic, mostly multicellular organisms with cell walls made of chitin rather than cellulose, and they obtain nutrition heterotrophically by absorption after secreting digestive enzymes onto their food. Unlike plants, fungi lack chlorophyll and cannot photosynthesise, which is why they are placed in their own separate kingdom rather than under Plantae.

116. Answer: a

Explanation:

When guard cells lose water (become flaccid), stomata close, directly reducing transpiration -- the loss of water vapour from the plant through stomatal openings -- since the pathway for water vapour escape is shut.

117. Answer: c

Explanation:

Capillaries, despite their individually tiny diameter, have the maximum total cross-sectional area of all blood vessels because there are millions of them branching throughout the body, which also causes blood flow to slow down there for efficient exchange.

118. Answer: b

Explanation:

Each nephron is the functional filtering unit of the kidney, consisting of a glomerulus and Bowman's capsule that filter blood plasma under pressure, followed by a long renal tubule. As the filtrate passes along the tubule, useful substances such as glucose, amino acids, ions, and most of the water are selectively reabsorbed back into the blood, while wastes and excess substances remain to be excreted as urine. This two-step process of filtration followed by selective reabsorption, along with some tubular secretion, is the nephron's central role.

119. Answer: b

Explanation:

Asexual reproduction involves a single parent producing offspring through mitotic division without the fusion of gametes, so the offspring are genetically identical

copies, or clones, of the parent. Because there is no mixing of genetic material from two parents, this mode of reproduction does not increase genetic variation and instead preserves the parent's genotype unchanged across generations. It is, in fact, the predominant mode of reproduction in unicellular organisms such as bacteria and amoeba, which reproduce by binary fission without forming gametes.

120. Answer: b

Explanation:

In humans, females carry two X chromosomes (XX) while males carry one X and one Y chromosome (XY), so all eggs produced by the mother carry a single X chromosome. During spermatogenesis, the father produces sperm carrying either an X or a Y chromosome in roughly equal numbers, and it is which type of sperm fertilises the egg that decides the child's sex, an XY combination giving a male and an XX combination giving a female. The mother's chromosome contribution is therefore constant, making the father's sperm the deciding factor.

121. Answer: b

Explanation:

An endemic disease is one that is constantly and consistently present within a particular geographic region or population, maintaining a stable baseline level rather than spreading explosively. This differs from an epidemic, which spreads rapidly through a population, or a pandemic, which spans multiple countries. Malaria in certain tropical regions is a classic example.

122. Answer: b

Explanation:

The stratospheric ozone layer absorbs most of the sun's harmful ultraviolet-B (UV-B) radiation before it reaches the Earth's surface. Without this protective shield, high UV-B exposure would sharply increase risks of skin cancer, cataracts, and damage to plant and marine life. It does not trap infrared radiation or directly generate oxygen.

123. Answer: c

Explanation:

In a balanced terrestrial ecosystem, producers (green plants) form the base of the biomass pyramid and generally have the largest biomass, since energy and biomass decrease at each successive trophic level moving up the food chain.

124. Answer: b

Explanation:

Crop rotation involves growing different types of crops sequentially on the same land across seasons. This practice breaks the life cycles of pests and pathogens that target specific crops, reducing their build-up, and helps maintain soil fertility by balancing nutrient uptake and, when legumes are included, replenishing soil nitrogen naturally.

125. Answer: b

Explanation:

Rhizobium bacteria live symbiotically in the root nodules of leguminous plants and carry out biological nitrogen fixation, converting inert atmospheric nitrogen gas into ammonia and other usable nitrogenous compounds that the plant can

absorb. In return, the plant supplies the bacteria with carbohydrates, and this process naturally enriches soil nitrogen.

126. Answer: b

Explanation:

Differentiating the displacement equation $s = 4t^2 + 2t$ once gives velocity $v = 8t + 2$, and differentiating again gives acceleration $a = 8 \text{ m/s}^2$, which does not depend on time. Hence the body moves with a constant acceleration of 8 m/s^2 .

127. Answer: b

Explanation:

On a velocity-time graph, the area enclosed between the curve and the time axis over an interval equals the integral of velocity with respect to time, which gives the displacement of the body during that interval. This is a standard result used to relate v-t graphs to motion analysis.

128. Answer: b

Explanation:

In uniform circular motion, the speed (magnitude of velocity) remains constant, but the direction of velocity continuously changes as the object moves along the circular path, so velocity itself is not constant.

129. Answer: a

Explanation:

Newton's second law of motion states that the net force acting on a body is directly proportional to the rate of change of its momentum, expressed as $F = dp/dt$. For constant mass, this simplifies to the familiar form $F = ma$.

130. Answer: b**Explanation:**

By conservation of mechanical energy, the entire loss in gravitational potential energy of the stone as it falls through height h is converted into kinetic energy, since air resistance is ignored. The potential energy lost is mgh , so the kinetic energy just before hitting the ground equals mgh .

131. Answer: c**Explanation:**

The speed of sound depends on the elasticity and density of the medium, and is generally highest in solids, followed by liquids, then gases, because particles in solids are tightly bound and transmit vibrations most efficiently. Steel, being a rigid solid, carries sound much faster than water or air, while sound cannot travel through a vacuum at all.

132. Answer: b**Explanation:**

The human ear retains a sound sensation for about 0.1 second, a phenomenon called persistence of hearing. For an echo to be heard as a distinctly separate

sound rather than blending with the original, the reflected sound must reach the ear at least 0.1 second later, corresponding to a minimum reflecting-surface distance of roughly 17.2 metres in air.

133. Answer: c

Explanation:

When an object is placed between the focus and pole of a concave mirror, the image formed is virtual, erect, and enlarged, appearing behind the mirror -- this is the principle used in shaving/makeup mirrors.

134. Answer: b

Explanation:

The focal length of a lens in metres is the reciprocal of its power: $f = 1/P = 1/(-2) = -0.5 \text{ m}$. A negative power indicates a diverging (concave) lens, and its focal length has a magnitude of 0.5 m, so the lens is diverging with a focal length of 0.5 m.

135. Answer: b

Explanation:

Sunlight entering the atmosphere is scattered by gas molecules through Rayleigh scattering, which scatters shorter wavelengths such as blue and violet far more strongly than longer wavelengths like red and orange, roughly in proportion to the inverse fourth power of wavelength. Since human eyes are more sensitive to blue than violet, the sky appears predominantly blue.

136. Answer: a

Explanation:

By Ohm's law, $V = IR$, so the slope of a $V-I$ graph (V on y -axis, I on x -axis) equals R , the resistance of the conductor -- not its conductance, which is the reciprocal ($1/R$).

137. Answer: a

Explanation:

For resistors joined in parallel, the equivalent resistance is found from $1/R = 1/R_1 + 1/R_2$. Substituting $R_1 = 4\ \Omega$ and $R_2 = 6\ \Omega$ gives $R = (4 \times 6)/(4 + 6) = 24/10 = 2.4\ \Omega$.

138. Answer: b

Explanation:

By Joule's law of heating, the heat produced in a resistor is given by $H = I^2Rt$, so the heating effect is directly proportional to I^2R . This is why a higher current or resistance produces much greater heat.

139. Answer: b

Explanation:

Fleming's left-hand rule gives the direction of the force acting on a current-carrying conductor placed inside a magnetic field. The thumb, forefinger, and

middle finger are held mutually perpendicular to represent force, field, and current respectively.

140. Answer: a

Explanation:

The standard frequency of AC electric supply in domestic circuits across India is 50 Hz, as per the national electricity grid standard -- 60 Hz is used in countries like the USA, not India.

141. Answer: b

Explanation:

Intensive properties do not depend on the amount of matter present -- density, refractive index, and temperature remain the same regardless of sample size, unlike extensive properties like mass, volume, and length which scale with quantity.

Your Personal Exams Guide

142. Answer: b

Explanation:

Luster, hardness, insolubility in water, and good electrical conductivity in the solid state are classic characteristics of metals, whose atoms are arranged in a regular, ordered crystalline lattice. Ionic compounds conduct only when molten or dissolved, not in the solid state, so a crystalline metal is the best classification here.

143. Answer: b

Explanation:

Iron filings are first removed with a magnet since they are the only magnetic component of the mixture. The remaining sand-and-salt mixture is dissolved in water, which dissolves the salt but leaves the insoluble sand behind; filtration then removes the sand, and evaporating the filtrate recovers pure dry salt crystals.

144. Answer: d**Explanation:**

Winnowing uses wind to separate components based on the difference in weight between heavier and lighter particles, so it works best when this difference is large. It becomes least reliable when the two components are close in size and weight, since the wind cannot clearly carry the lighter particle away while leaving the heavier one behind.

145. Answer: b**Explanation:**

Dissolving alum in hot water forms a saturated solution, and as the solution cools, the solubility of alum decreases, causing the excess solute to separate out as clear, well-formed crystals. This process of recovering a pure solid from its saturated solution by cooling is called crystallisation.

146. Answer: d**Explanation:**

Red cabbage extract is a natural pH indicator that changes through a range of colours and can distinguish a strong base from a weak base more precisely than plain water, unlike the reversed China rose colour claim in the other option.

147. Answer: b

Explanation:

Milk of magnesia contains magnesium hydroxide, a mild, weak base that reacts with and neutralises the excess hydrochloric acid present in the stomach, forming water and magnesium salts. Being a weak base, it neutralises acidity gently without triggering a harsh or excessive reaction.

148. Answer: b

Explanation:

Rusting occurs when iron reacts slowly with oxygen and moisture in the air to form hydrated iron oxide, a new substance, which makes it a chemical change. Since this oxidation reaction gradually releases a small amount of heat, it is classified as a slow exothermic chemical change.

149. Answer: a

Explanation:

Setting of plaster of Paris involves a chemical reaction with water to form gypsum, yet this hydration reaction can be reversed by heating, which drives off the water and regenerates plaster of Paris, making it chemically driven but reversible under changed conditions. Curdling of milk and burning of magnesium, by contrast, are

essentially irreversible chemical changes, while magnetisation of iron involves no chemical interaction at all.

150. Answer: b

Explanation:

Crude petroleum is a mixture of many hydrocarbons with different boiling points, so refineries separate it into useful fractions such as petrol, kerosene, and diesel using fractional distillation. Each fraction vaporises and then condenses within its own characteristic temperature range inside a fractionating column.

Prepp

Your Personal Exams Guide