



AL-AMEEN OLYMPIAD 2024

CLASS-IX

Full Marks: 100

Time: 3 hours

ENGLISH

1. In case of voice change from active to passive, the correct sentence structure will be:

- (A) Subject + Auxiliary verb + Being + Past Participle + Object.
- (B) Subject + Being + Past Participle + Object.
- (C) Subject + Am + Being + Past Continuous + Object.
- (D) Subject + Auxiliary verb + Past participle) + Been + Object.

2. Choose the correct rules for voice change:

- (i) Subject and object are interchanged.
- (ii) Tense is modified.
- (iii) Tense remains the same.
- (iv) Form of the sentence must be changed.

(A) i, ii, iii is true. (B) ii, iv, i is false.

(C) i, ii, iv is true. (D) i, iii, iv is true.

3. "I went home." - This sentence cannot be converted to passive voice because:

- (A) It is an example of the past tense. (B) It has adverbial object.
- (C) "Went" is a factitive object. (D) "Home" is a reflexive noun.

4. Choose the correct passive voice for "He polishes shoes."

- (A) Shoes polish him. (B) Shoes are polished by him.
- (C) Shoes and he polish together. (D) Shoes polishes him.

5. Choose the correct option for the indirect speech form of: 'He said to me, "What is your name?"'

- (A) My name is Mr. Rahim. (B) He said to me what is my name.
- (C) He asked me what was my name (D) He asked me what my name was.

6. Statement 1: In the case of interrogative sentences, indirect speech always contains "if" or "whether."

Statement 2: Interrogative sentences with 'W/H' questions require 'if' / 'whether' when converted to indirect speech.

Statement 3: Interrogative sentences without 'W/H' questions only require 'if' / 'whether' when converted to indirect speech.

- (A) Statement 1 is true, S2 and S3 are false.
- (B) Statement 3 and S2 are true S1 is false.
- (C) Statement 1 and S3 are false, S2 is true.
- (D) Statement 1 and S3 are true, S2 is false.

7. He said to me, "Let us play." (Indirect Speech)

- a) He told me to play.
b) He said to me that let us play.
c) He proposed to me that we should play
d) He proposed to me that let us play

Choose the correct prepositions:

8. It is not my way to cry ____ my achievement.

- a) up b) out c) for d) with

9. He died __ COVID-19.

- a) By b) From c) Of d) Out

10. The British went _____ the Americans.

- a) Out b) By c) Against d) In

11. Please call _____ the doctor.

- a) In b) Up c) Out d) For

12. He deals _____ rice.

- a) With b) For c) About d) In

Choose the right option:

13) The exam was _____ than I thought.

- a) Tough b) More tough c) Tougher d) More toughen

Choose the correct meaning of the underlined word:

14. She was in a state of tethered ecstasy as she watched the sunset.

- a) Extreme b) Bliss c) Sorrow d) Blessing

15. The tsunami was a massive catastrophe.

- a) Flood b) Waves c) Disaster d) Water

16. He earns in fits and starts.

- a) Monthly b) Yearly c) Regularly d) Irregularly

17. My cousin left India for good.

- a) For a better job b) For ever c) For money d) For travelling

Read the conversation and complete the paragraph that follows by choosing the correct option:-

Ashik: Hello Alam, how are you?

Alam: Not so good.

Ashik: Why? What is wrong?

Alam: Just a bit nervous. How are you getting on with your studies?

Ashik: My preparation is going as planned.

Alam: That is wonderful.

Ashika wished Alom and a) _____. Alom replied that he was not so good.

Ashika b) _____ Alam said c) _____ and asked how Ashika's studies were getting along .

- 18.** A) i. asked how he were ii. asked how he was
iii. asked how he was iv. asking how he were

- 19. B)** i) asks what is wrong
ii) asked what is wrong
iii) Asking what has wrong
iv) asked what was wrong
- 20. C)** i. He has just a bit nervous.
ii. He is just the bit nervous.
iii. He was just a bit nervous.
iv. He had been just bit nervous.

Read the following paragraphs and answer the questions:

1. It is an indisputable fact that the world has gone too far with the innovation of new technologies such as mobile phones, the internet and so on, due to which people are able to tour the cosmos virtually sitting at one place using their smart devices or other technological gadgets. Though mobile internet access is oftentimes hurried and short, it can still provide common internet features like alerts, weather data, emails, search engines, instant messages, and game and music downloading.
2. Due to the easy access of smartphones, communication has been very effective and instant. People are able to convey their message all around the globe to their loved ones without spending hefty sums of money. Adults are always fond of such gadgets and they always welcome and adopt such new technology readily. Further, young people have been able to broaden their minds and improve their skills by doing research on the Internet. For instance, they use smart phones to look up any new word they come across. As we know that most of the universities have online teaching provision and smartphones assist the students to complete their assignments on time.
3. The mobile phone has been a lifesaver for a lot of people in case of an emergency. Likewise, use of smartphones can be of vital importance in preventing crimes in the society by providing information to the security forces in time.
4. Nonetheless, for the young the use of mobile phone can be like an addiction and they can misuse it. Young people are also prone to getting involved in undesirable activities on the Internet. This might have adverse effect on their academic performance. Therefore, young people should always be monitored and made aware of its bad outcomes.
5. Also a major contributor to its popularity is the availability of prepaid or pay as you go services from a phone shop or an online store. This allows subscribers to load text or airtime credits to their handsets by the use of their credit cards, debit cards or by buying a prepaid card from the network they subscribe to. This plan also doesn't commit a particular customer to a contract. If prepaid card is not that appealing to you, then you can opt to subscribe using the pay by month plan.

Based on your understanding of the passage, answer the following questions.

21. The reason why communication today has become very effective and instant, is because of the-

- a) Improved mobility system
- c) Growing organization

- b) Easy access of smart phones
- d) Increasing number of vehicles

22. Choose the option that best captures the central idea of the passage from the given sentences.

- i) Mobile phones are beneficial for the young generations.
- ii) Smart phones have enabled us to research on the internet.
- iii) Crimes can be prevented by the use of smart phones.
- iv) Mobile phones are a boon to modern people but their addiction should be avoided.

- a) Option (1) b) Option (2) c) Option (3) d) Option (4)

23. Young people with smart phones in their hands are needed to be monitored because they can

- a) Waste time (1)
- b) Be negligent (2)
- c) Misuse the gadget (3)
- d) Be indulged in undesirable activities on Internet (4)
- e) Disobey their parents (5)

- i) 1 and 3 ii) 2 and 4 iii) 3 and 4 iv) 1 and 5

24. Choose the option that correctly states the two meanings of 'virtually', as used in para 1.

- a) Correctly (1) b) Almost (2) c) More or less (3)
- d) Similarly (4) e) Online (5)
- i) 1 and 4 ii) 2 and 5 iii) 3 and 4 iv) 4 and 5

25. What does the phrase 'hefty sums of money' mean in the passage?

- a) Little money b) Large amount of money
- c) Penniless d) Treasury

SOCIAL SCIENCE

26. Consider the following statements w.r.t atmosphere:-

- i) Volume and density of gases increases with increasing altitude from Earth's surface.
- ii) N_2 , an active gas is largely responsible for the heat trapping mechanism.
- iii) O_3 gas occupies above 20% of the Earth's atmosphere.
- iv) Oxygen gets combined through oxidation process.

Which of these are correct _____?

- A) i only B) ii & iii only C) iv only D) i, ii, iii and iv

27. Match the following lakes with their location

- i) Chilka a) Kashmir
- ii) Loktak b) Orissa
- iii) Ular c) Manipur
- iv) Pulicat d) Tamil Nadu

- A) i---a; ii---c;iii---b;iv--- d B) i---c; ii---b;iii---a;iv---d
C) i---b; ii---c;iii---a;iv---d D) i---d; ii---c;iii---a;iv---b

28. Statement A: The North Indian Rivers with wider valleys are swift flowing rivers.

Statement B: The North Indian Rivers dry up during the winter season

- A) Statement A is correct: Statement B is incorrect
B) Statement A is incorrect: Statement B is correct
C) Both are correct D) Both are incorrect

29. Which of the given statements are correct w.r.t the Himalayas:

- i) The Himalayas stretch from the Nanga Parbat in Kashmir to the boundary of Arunachal Pradesh
ii) The average height of Himalayas exceeds 6000m
iii) The Himalayas were formed during the Tertiary period as a result of collision between Gondwanaland and Angaraland.

- A) i only B) i and iii only C) ii and iii only D) i, ii and iii only

30. Arrange the following rivers in the North to South order

- i) Kaveri ii) Pennar iii) Godavari iv) Krishna
A) i---iv---ii---iii B) iii---iv---ii---i
C) i---ii---iii---iv D) iii---iv---i---ii

31. You are on the shore side about 5 km south of Mumbai, which of these places are you likely to be present on__:-

- A) Konkan B) Coromandal C) Malabar D) Northern Circars

32. Match the following:-

- | | |
|----------------------------|-----------------------------|
| i) Evergreen veg | a) Sheds leaves once a year |
| ii) Monsoon veg | b) Alpine trees |
| iii) Dry thorny veg | c) Cactus, Palm etc |
| iv) Mountain veg | d) No leaf shedding |
| A) i-a, ii-c, iii-d, iv-d | B) i-b, ii-d, iii-c, iv-a |
| C) i-c, ii-a, iii-d, iv- b | D) i-d, ii-a, iii-c, iv-b |

33. Statements-I : The region between the Satpura and Vindhya is east to west sloping

Statement-II: Narmada and Kaveri are two west flowing rivers of India.

- A) Statement-I & II are correct and II is the explanation of I
B) Statement I & II are correct but II is not the correct explanation.
C) Statement I is correct but Statement-II is incorrect. D) Both are incorrect.

34. Match the following:

- | | |
|------------------------------------|------------------------------------|
| i) Raja Ram Mohan Roy | a) Young Bengali Association |
| ii) Justice Ranade | b) Arya Samaj |
| iii) Derozio | c) Abolition of Sati |
| iv) Sudhi movement | d) Deccan Education Society |
| A) 1- (c) 2-(b) 3- (a) 4-(d) | B) 1- (c) 2-(d) 3- (a) 4-(b) |

C) 1- (b) | 2-(a) | 3- (d) | 4-(c)

D) 1- (a) | 2-(c) | 3- (d) | 4-(b)

35. Which of these factors can be most appropriately considered one of the reasons for the growth of Indian nationalism?

A) Moamoriya Rebellion

B) Disintegration of the Mughal empire

C) Charter act of 1853

D) Introduction of western education

36. Given below is a map of India indicating a type of vegetation. Select the appropriate option:-



A) Evergreen

B) Semi Evergreen

C) Dry Thorny

D) Grassland

37. The Yandaboo treaty was signed on 24th Feb-

A) 1814

B) 1816

C) 1820

D) 1826

38. Who among the following is associated with Indian National Congress?

A) Mahatma Gandhi

B) S.C Bose

C) Mohammed Jinnah

D) Allan Octavain Hume

39. The first electric telegraph line in India was laid in the year:-

A) 1874

B) 1854

C) 1834

D) 1824

40. Which of these Vedas has the oldest scriptures?

A) Rig Veda

B) Sama Veda

C) Yajur Veda

D) Atharva Veda

41. The total height of the atmosphere is-

A) 5000 km

B) 10000 km

C) 15000 km

D) 12000 km

42. Which act marked an end to the Company rule in India:-

A) Govt. of India Act 1919

B) Govt. of India Act 1858

C) Govt. of India Act 1935

D) Govt. of India Act 1947

43. The Board of Control and 'Court of Directors' is associated to which of the organization mentioned below:-

A) Arya Samaj

B) East India Company

C) Indian National Congress

D) The Hindu college

44. Look at the figure given below:-



The above symbol belongs to which of the organization mentioned below _____

A) Arya Samaj

B) Ramkrishna Mission

C) Prarthana Samaj D) Theosophical Society

45. The Swadeshi movements was launched in response to:-

A) The passing of the Vernacular Press Act. B) The Partition of Bengal in 1905
C) The enactment of the Rowlatt Act. D) The introduction of the Ilbert Bill

46. Assertion- Indian National Congress was the first political party of India.

Reason- It was established to preserve the rights of the Indians in the British government.

A) Only Assertion is correct B) Only Reason is correct
C) Both are correct D) Both are incorrect

47. How many seats are there in the Lok Sabha reserved for Scheduled Caste (SCs) and Scheduled Tribes (ST)?

A) 47 B) 60 C) 84 D) 100

48. GDP stands for _____:

A) Gross National Product B) Gross Developed Product
C) Gross Domestic Product D) Gross Demand Product

49. Which party system is followed in India:-

A) One party B) Multi party C) Bi party D) None of the above

50. Cotton is the best cultivated in which type of soil _____:

A) Laterite soil B) Black soil C) Alluvial soil D) Red soil

GENERAL MATHS

51. If $x = 7 + 4\sqrt{3}$ and $xy = 1$, then $\frac{1}{x^2} + \frac{1}{y^2}$

a. 64 b. 134 c. 194 d. $\frac{1}{49}$

52. Simplify-

$$\left(\frac{x^{a+b}}{x^c}\right)^{a-b} \quad \left(\frac{x^{b+c}}{x^a}\right)^{b-c} \quad \left(\frac{x^{c+a}}{x^b}\right)^{c-a}$$

a. 1 b. 0 c. -1 d. 2

53. If every side of a triangle is doubled, then increase in the area of the triangle is-

a. $100\sqrt{2}\%$ b. 200% c. 300% d. 400%

54. The mean of a, b, c, d and e is 28. If the mean of a, c, e is 24. What is the mean of b and d?

a. 31 b. 32 c. 33 d. 34

55. Let the sum of three natural numbers be 9, the sum of their squares be 29 and the sum of their cubes be 99, then find the product of the numbers.

a. 72 b. 56 c. 48 d. 24

56. If Z denotes the collection of all integers and N denotes the collection of all natural numbers, then which of the following is true?

- a. Z is contained in $Z \setminus N$ b. $Z \setminus N$ is contained in Z
 c. N is contained in $2Z \setminus Z$ d. $Z \cup N$ is uncountable

57. If $|x| = \begin{cases} x, & \text{if } x \geq 0 \\ -x, & \text{if } x < 0 \end{cases}$ then, which of the following is true.

- a. $|x| = x^2$ b. $|x|^2 = x^2$ c. $|-x| < |x|$ d. $|x| + |-x| = 0$

58. When n is very close to $+\infty$, $\frac{1}{n}$ is very close to

- a. 0 b. $-\infty$ c. $(\frac{1}{n})^2$ d. n

59. Consider the statements-

i) If $x > 1, a > 1$ then $\log_a x < 0$

ii) For $0 < a < 1$, if $x_1 > x_2$ then $\log_a x_1 < \log_a x_2$

Choose the right options-

- (A) (i) is false, (ii) is true (B) both (i), (ii) are true.
 (C) (i) is true. (D) (ii) is not true.

60. Let x be the biggest negative even number and y be the smallest non-negative even number, then-

- a. $x + y > 0$ b. $x + y = 0$ c. $x - y = 2$ d. $x + y = -2$

61. If $a > b > 0$, then –

- a. $a < \frac{a+b}{2}$ b. $\frac{a+b}{2} < b$ c. $\sqrt{ab} > b$ d. $a < \sqrt{ab}$

62. Let $x_n = \begin{cases} 0.5, & \text{if } n \text{ is odd} \\ -1/2, & \text{if } n \text{ is even} \end{cases}$

then,

$x_{17} - 1/x_{18} - x_{19} - x_{20} - 225$ equals –

- a. -222.5 b. -22.25 c. $+223.5$ d. -223.5

63. Let E be the event of getting a sum at-least 11 from the faces of two dice thrown at the same time. Then $P(E)$ is-

- a. $\frac{1}{3}$ b. $\frac{1}{36}$ c. $\frac{1}{12}$ d. 1

64. Let us consider a circle be centered at y . A point x will be an interior point of the circle having radius r if-

- a. $|x - y| < r$ b. $|x - y| > r$ c. $|x - y| = r$ d. $|x - y| > 0$

65. If X denotes the name of the language T can talk very easily and let F be the country where T lives. Let Y be the official language of F . Let X and Y be distinct, then

- a. We are sure that other people of F also can talk in X .
- b. We are sure that T can't speak in Y .
- c. We are not sure about T can speak Y or not.
- d. Surely X is a language that is similar to Y .

66. Maximum real value of $-\sqrt{9-x^2}$ for real x is –

- a. 0
- b. 3
- c. -3
- d. less than 0

67. To keep $\sqrt{9-x^2}$ real, minimum value of x is –

- a. +3
- b. -3
- c. 0
- d. None of the above.

68. For real numbers a and b with $a, b > 0$ and $a + b = 1$, maximum value of ab is –

- a. $\frac{1}{2}$
- b. $\frac{1}{3}$
- c. $\frac{1}{4}$
- d. $\frac{2}{3}$

69. If a, b and c are positive real numbers, such that $a + b + c = 6$, then the minimum value of $(a-1)^2 + (b-2)^2 + (c-3)^2$ is-

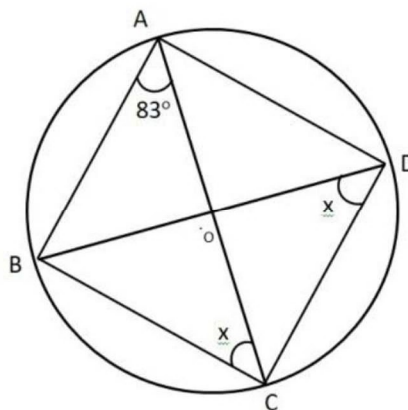
- a. 0
- b. 2
- c. 12
- d. 6

70. Power set of \emptyset is –

- a. Singeton
- b. Empty
- c. uncountable
- d. Does not exist

71. From the figure if

$\angle BAD = 83^\circ$, AC is the bisector of $\angle BCD$ and $\angle BCA = \angle BDC = x$, then $x^2 - 1$ is equal to-

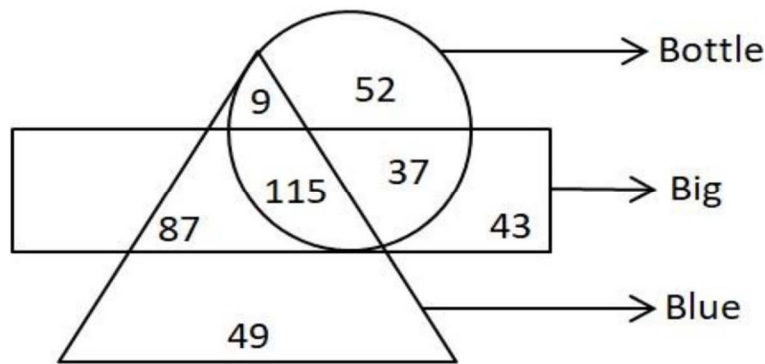


- a. 2500
- b. 2351.25
- c. 2000
- d. 47.5

72. $(-1)^n$ gives only _____ value, whatever the value of n may be. Choose the right option to fill up the blank.

- a. 1
- b. 2
- c. -1
- d. 0

73. In the given figure, how many big bottles are not blue?



- a. 37 b. 115 c. 152 d. 89

74. If $2^x = 4^y = 8^z$ and $\frac{1}{2x} + \frac{1}{4y} + \frac{1}{4z} = 4$, then value of x is –

- a. $\frac{7}{16}$ b. $\frac{9}{16}$ c. $\frac{7}{32}$ d. $\frac{9}{48}$

75. If a polynomial

$f(x)$ satisfies the condition $f(x) = f(-x)$ for all x , and if $f(1) = 2$, then the value of $f(1) + f(-1)$ is –

- a. 2 b. 0 c. 4 d. -2

GENERAL SCIENCE

76. Which of the following correctly represents 360g of water?

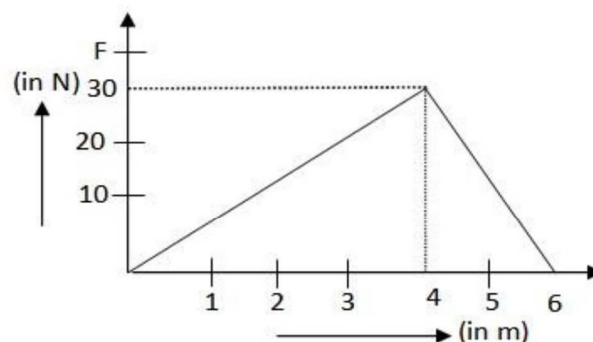
- i) 2 moles of water
ii) 20 moles of water
iii) 6.022×10^{23} molecules of water
iv) 1.2044×10^{25} molecules of water

- (a) (i) (b) (i) & (iv) (c) (ii) & (iii) (d) (ii) & (iv)

77. Choose the correct rotation between kinetic energy and momentum

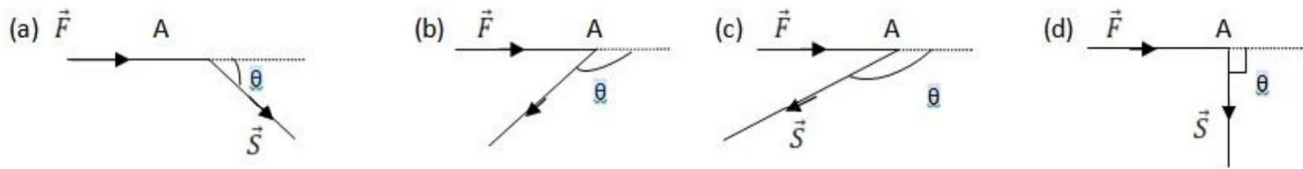
- a) $P = \sqrt{2mk}$ b) $p^2 = 2m^3k$ c) $K = \sqrt{2pk}$ d) $p = mvk$

78. From the graph of 'force' versus 'displacement of a particle', find the total work done by the force and choose the correct option.



- a) 20 joule b) 10 joule c) 200 joule d) 90 joule

79. Identify the positive work done by a body if the displacement is represented by \vec{S} and applied force as \vec{F}



80. A particle moves along a circular path of radius 'r'. If it completes half a revolution, what is the ratio of displacement to the distance covered.

- a) $1:\pi$ b) $1:2\pi$ c) $1:2$ d) $2:\pi$

81. A car accelerates uniformly from rest to a velocity ' v ' in time ' t '. the distance covered during this time is

- a) $v \cdot t$ b) $\frac{v \cdot t}{2}$ c) $\frac{v^2}{2t}$ d) $\frac{v^2}{2}$

82. The numbers of protons, neutrons and electrons in four elements 1,2,3,4 are as follows:

- i) $p = 6$, $n = 6$, $e = 6$ ii) $p = 6$, $n = 7$, $e = 6$
 iii) $p = 18$, $n = 22$, $e = 18$ iv) $p = 19$, $n = 21$, $e = 19$

In these

- a) Elements (i) & (ii) are isotopes and elements (iii) & (iv) are isobars.
 b) Elements (i) and (ii) are isotopes but elements (iii) and (iv) are not isobars.
 c) Elements (i) and (ii) are isobars and elements (iii) and (iv) are isotopes.
 d) Elements (i) and (ii) are isobars but elements (iii) and (iv) not isotopes.

83. Match list-1 with list-2

List-I	List-II
i. Disc shaped sacs or cisternae	
ii. Chromatin	
iii. Ribosomes	
iv. Nucleus	

Choose the correct answer from the option given below

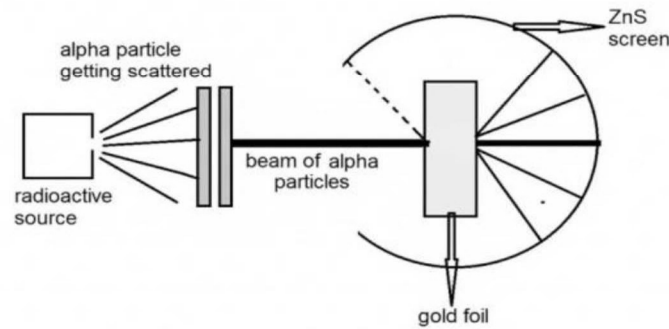
- a) A – ii, B- iii, C- i, D-iv c) A-ii, B –iv, C-i, D-i
 b) A- ii, B-iv, C-iii, D-i d) A-iii, B-iv, C-i, D-ii

84. The ratio of the distances travelled by a freely falling body in the 1st , 2nd , 3rd and 4th second is

- a) $1:1:1:1$ b) $1:2:3:4$ c) $1:4:9:16$ d) $1:3:5:7$

85. Case: Rutherford, in 1911, performed an experiment in which he bombarded a thin foil of a heavy metal like gold with a beam of fast moving alpha (α)- particles which are doubly charged helium ions (He^{2+}) having 2

units of positive charge and 4 units of mass (4u). These were obtained from radium placed in the cavity of a block of lead and made into a five beam with a slit.



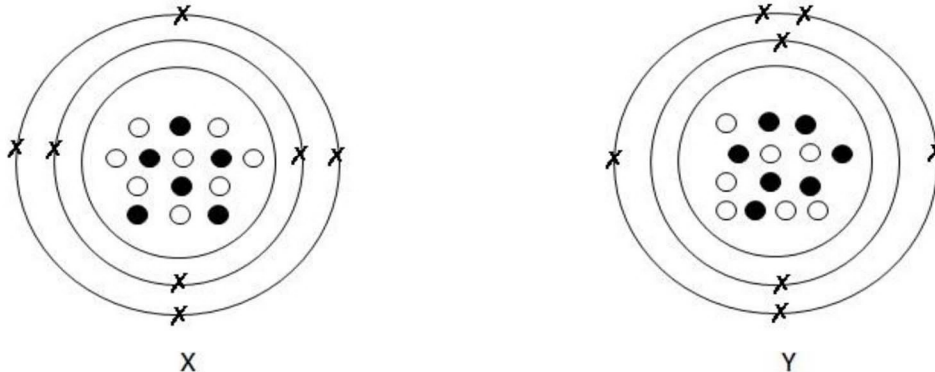
Rutherford α – particle scattering experiment showed that

- electrons have negative charge
- the mass and positive charge of the atom is concentrated in the nucleus
- neutrons exist in the nucleus
- most of the space in an atom is empty

Which of the following statements are correct?

- (a) (i) and (iii) only (b) (ii) and (iv) only
(c) (i) and (iv) only (d) (iii) and (iv) only

86. Case: The given diagram shows the atomic structures of elements X and Y.



Elements X and Y are

- a) Isotopes b) Isolectronic c) Isobars d) Isotones

87. Which of the following is the unique features of mammals:

- a) muscular diaphragm b) Ear pinna
c) Mammary glands d) body hairs

Choose the correct option from the option

- a) 1, 3, 4 b) 1, 2,3 c) 2,3,4 d) 1,2,3,4

88. Two masses m_1 and m_2 are experiencing the same force where $m_1 < m_2$. The ratio of their acceleration $\frac{a_1}{a_2}$ is

- a) 1 b) less than 1 c) greater than 1 d) all of these

89. Which of the following statement is incorrect?

- i) Global warming leads to the melting of polar ice caps
- ii) Aforestation cannot prevent soil erosion.
- iii) Deforestation cannot cause soil erosion.
- iv) Global warming can prevent polar ice caps from melting
- v) Plants plays a crucial role in maintain the oxygen carbondioxide balance in the atmosphere.

Choose the correct alternatives:-

- a) (i) , (ii), (v) are incorrect
- b) (i), (ii), (iii) are incorrect.
- c) (ii), (iii) (iv) are incorrect.
- d) (ii) and (iv) are incorrect only.

90. Select the correct statements from the following:

- 1. Atoms of all elements are composed of three fundamental particles.
- 2. The mass of proton is 1.67×10^{27} kg.
- 3. Dalton's atomic theory regarded the atom as an ultimate particle of matter.
- 4. All isotopes of a given elements show same chemical properties.
- 5. Protons and electrons are collectively called mesons.

Choose the correct answer from the option given below:-

- a) 1,2,3,4,5 are correct
- b) 1,2,3,4 correct
- c) 1,2,3,5 correct
- d) 2,3,4,5 correct

91.



If the angle of repose is maintained to be as 44.5° then, choose the options where the ball will start moving:

- a) 1 & 3
- b) 2 & 4
- c) only 2
- d) only 4

92. Choose the correct combination of the following from the definition of 1 second.

ATOM

- a) $_{38}\text{Sr}$
- b) $_{55}\text{Cs}$
- c) $_{85}\text{At}$
- d) $_{32}\text{Ge}$

VIBRATIONS

- i) 7,655,299,778
- ii) 8,666,291,660
- iii) 9,192,631,770
- iv) 10,166,231,270

1 second is the time taken by a _____ atom to complete _____ vibrations.

- A) a & iii
- B) b & iii
- C) c & i
- D) d & iv

93. A small block slides down on a smooth inclined plane starting from rest at time $t = 0$. Let S_n be the distance travelled by the block in the interval.

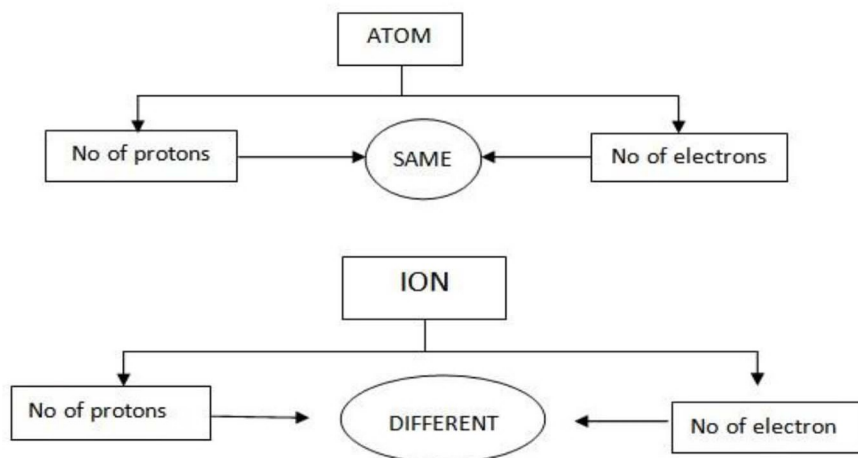
$t = n - 1$ to $t = n$. The ratio $\frac{S_n}{S_{n+1}}$ is

- a) $\frac{2n+1}{2n-1}$ b) $\frac{2n}{2n-1}$ c) $\frac{2n-1}{2n}$ d) $\frac{2n-1}{2n-1}$

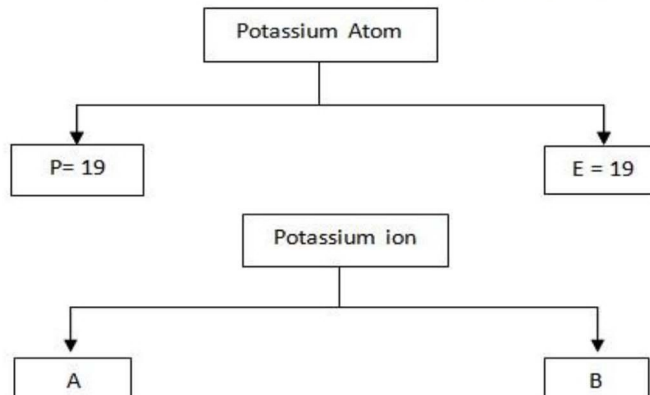
94. Who concluded based on his studies on plant tissue, that the presence of cell wall is unique characters of plant cells.

- a) Matthias Schleiden b) Theodor Schwann
c) J.B.S Haldane d) Rudolph. Virchow

95.



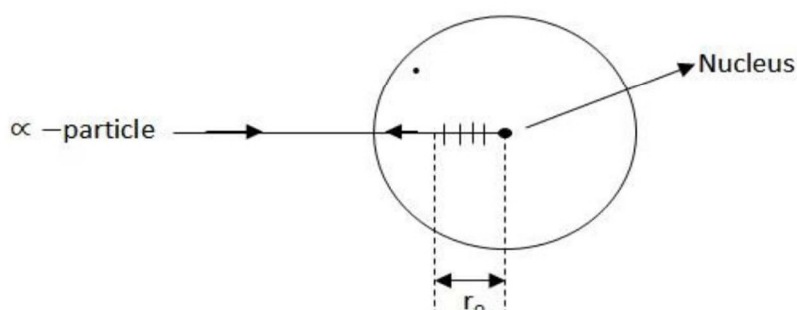
Take reference from the above diagram and decode the information's provided below.



Complete the boxes from the option given below:

- a) A= 19, B= 20 b) A= 20, B=19
c) A= 18 , B= 18 d) A = 19, B=18

96. Read the following passage and decode the information



Suppose an α -particle of mass 'm' and initial velocity 'v' moves directly towards the centre of the nucleus of an atom . As it approaches the positive nucleus, it experiences coulombic repulsion and its kinetic energy gets progressively converted into electrical energy. At a certain distance ' r_0 ' from the nucleus the α -particle stops for a moment and then begins to retrace its path with an 180° angle. The charge on an α -particle, $q_1 = +2e$, charge on a scattering nucleus, $q_2 = +Ze$ (Where Z is the atomic number of target atom)

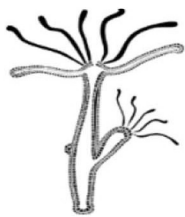
The initial kinetic energy of α -particle, $K_\alpha = \frac{1}{2}mv^2$. Electrostatic potential energy of α -particle and nucleus at distance $r_0 \Rightarrow U = k \frac{q_1 q_2}{r_0} = k \frac{2e \cdot Ze}{r_0}$

By conservation of energy, $K_\alpha = U$

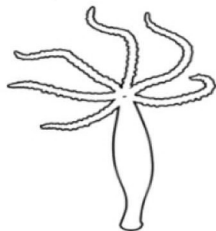
Find the expression of r_0 from the above information

- a) $\frac{2ke^3}{mv^2}$ b) $\frac{4kZe^2}{mv^2}$ c) $\frac{8kZe^4}{mv}$ d) $\frac{8kZe}{m^2v^2}$

97. Among the following diagrams in which organism adults are radically symmetrical while larvae are bilateral symmetrical



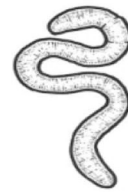
a) Hydra



b) Obelia



c) Starfish



d) Earthworm

98. Which of the following organelles have their own genetic materials

- a) Chloroplast, Mitochondria, Nucleus
 b) Ribosome, Endoplasmic, Reticulum, nucleus
 c) Chloroplast, Mitochondria, Nucleolus
 d) Ribosome, Mitochondria, Nucleus

99. Which of the following vertebrate classes with their distinguishing features-

Column A

1. Pisces
2. Amphibians
3. Reptiles
4. Aves

Column B

- a) cold blooded
- b) Warm blood lay hard shelled eggs.
- c) cold blooded scales, lay eggs on land
- d) Live in water, gills for respiration

a).1-d, 2-a, 3-c, 4-c

b) 1-b, 2-c, 3-d, 4-a

c)1-a, 2-d, 3-b, 4-c

d) 1-c, 2-b, 3-a, 4-d

100. The number of electrons in the species H_2^+ , H_2 , O_2^+ are respectively:

- (a) 15, 2, 1 (b) 15, 1, 2 (c) 1, 2, 15 (d) 2, 1, 15