Kendriya Vidyalaya Sangathan, Lucknow Region

Session Ending Examination (2023-24)

Class- IX

Subject- Science

MARKING SCHEME

(Section – A Objective Type Questions Each 1 mark)

Q1 to 20 **(each 1 mark)**

1. a	2. c	3. b	4. b	5. c	6. d	7. d	8. b	9. a or 9. c	10. b
11. a	12. C	13. B	14. b	15. c	16.d	17.a	18.a	19.b	20.a

Section B (Very Short Answer Type Questions Each 2 Marks)

21. Particles in the air, if fuel with higher temperatures, acquire high kinetic energy, which aids them to move fast over a stretch. Hence, the smell of hot sizzling food reaches a person even at several meters. **(2 Marks)**

22. (i) sodium oxide – Na_2O (ii) aluminium chloride – $AlCl_3$
(iii) sodium sulphide – Na_2S(iv) magnesium hydroxide – $Mg(OH)_2$**(1/2+1/2+1/2+1/2)**

23. The Golgi apparatus consists of stacks of membrane-bound vesicles whose functions are as follows:- Storage of substances, Packaging of substances, Manufacture of substances Without the Golgi apparatus, the cells will be disabled from packing and dispatching materials that were produced by the cells. The Golgi apparatus is also involved in the formation of cells. Hence, in the absence of the Golgi apparatus, cells will not be produced.**(2 Marks)**

24. Given that the signal travels in a straight line, the distance between the spaceship and the ground station is equal to the total distance travelled by the signal. **(1/2 Marks)**
5 minutes = 5*60 seconds = 300 seconds. **(1/2 Marks)**
Speed of the signal = 3×10^8 m/s.
Therefore, total distance = (3×10^8 m/s) * 300s
= $9*10^{10}$ meters. **(1 Marks)**

25. When the branch of the tree is shaken, the branch moves in a to-and-fro motion. However, the inertia of the leaves in attached to the branch resists the motion of the branch. Therefore, the leaves that are weakly attached to the branch fall off due to inertia whereas the leaves that are firmly attached to the branch remain attached. **(2 Marks)**

26. The universal law of gravitation states that every object in the universe attracts every other object with a force called the gravitational force. The force acting between two objects is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centers. **(2 Marks)**

Section C (Short Answer Type Questions Each 3 Marks)

27. a. 0°C=273K **(1.5+1.5)**

300K= (300-273)°C = 27°C

b. 573K= (573-273)°C = 300°C

28. The formula unit mass of ZnO= Atomic mass of Zn + Atomic mass of O = 65u + 16u = 81u

The formula unit mass of Na_2O = 2 x Atomic mass of Na + Atomic mass of O = (2 x 23)u + 16u = 46u + 16u = 62u

The formula unit mass of K_2CO_3 = 2 x atomic mass of K + Atomic mass of C + 3 x Atomic mass of O = (2 x 39) u + 12u + (3 x 16) u = 78u + 12u + 48u = 138u **(1+1+1)**

29. (i) Mitochondria are known as the powerhouse of the cell. It is because it releases the energy required for different activities of life. Mitochondria releases energy in the form of ATP (Adenosine triphosphate) molecules, essential for numerous chemical activities of life. Hence, ATP is often referred to as the 'energy currency of the cell'.

(ii) When there is damage to the cell and when revival is not possible, lysosomes may burst, and the enzymes digest their own cell. Consequently, lysosomes are known as suicide bags.

(1.5+1.5)

30. Diagram of different types of muscles and difference. **(1/2+1+1/2+1+1/2+1)**

31. V= u + at **(1/2 Mark)**

u = 0 **(1/2 Mark)**

a = 0.0185 ms^{-2} **(2 Marks)**

32.Speed of sound (v) = 342 ms^{-1}

Echo returns in time (t) = 3 s

Distance travelled by sound = v × t = 342 × 3 = 1026 m

In the given interval of time, sound must travel a distance which is twice the distance between the reflecting surface and the source.

Therefore, the distance of the reflecting surface from the source =1026/2 = 513 m **(1+2)**

33. (i) Difference between manure and fertilizer **(1.5)**

(ii) Cross-breeding is generally the best method adopted for improving cattle breed quality. In this method, breeding between two good cattle breeds results in a new, improved variety of cattle breeds or offspring. While breeding, care is taken to have a good resultant with a high yield having resistance to climatic conditions. **(1.5)**

Section D (Long Answer Type Questions Each 5 Marks)

34. (a) (i) The atomic number of an atom is the same as the number of protons in that atom; hence, its atomic number is 8.

(ii) In an atom, the number of protons is equal to the number of electrons. Hence, both the charges – positive and negative – neutralise each other. Therefore, the atom does not possess any charge. **(1)**

(b) There is no expected stability in the revolution of the electron in a circular orbit. Charged particles radiate energy when accelerated, thus causing the revolving electrons to lose energy and would fall into the nucleus. Hence, atoms must be highly unstable. The matter would not exist in its known form, which clearly is an assumption as atoms are highly stable. **(2)**

(c) The atoms which have the same number of protons but a different number of neutrons are referred to as isotopes. Hence, the mass number varies. **(1+1)**

Example: The most simple example is the Carbon molecule which exists as ${}_6C^{12}$ and ${}_6C^{14}$

Uses of isotopes: - (i) The isotope of the Iodine atom is used to treat goitre, an iodine-deficient disease. (ii) In the treatment of cancer, an isotope of cobalt is used. (iii) Fuel for nuclear reactors is derived from the isotopes of the Uranium atom.

35. (a) Sclerenchyma tissue **(1)**

(b) Structure of neuron. **(2)**

(c) (i) The epithelial tissue, Squamous epithelium. **(each ½ mark)**

(ii) Tendon (iii) Phloem (iv) Adipose tissue

36. (a) W = F s **(1 marks)**

W = 56 j **(1 Marks)**

(b) K.E. of the object = 25J

Velocity of the object (v) = 5 m/s

K.E. = (½) mv^2 (1/2 Marks)

25 = (½) m $(5)^2$

50 = 25 x m

m = 50/25

m = 2 kg (1/2 Marks)

Now, when velocity is doubled

v = 10 m/s, m = 2 kg

K.E. = (½) x 2 x $(10)^2$

K.E. = 10^2

K.E. = 100 J (1/2 Marks)

When velocity is increased three times, then

v = 15 m/s, m = 2 kg

K.E. = (½) x 2 x $(15)^2$

K.E. = (15)

K.E. = 225 J (1/2 Mark)

(c) A body is claimed to possess power of one watt if it works at the speed of 1 joule in 1 s. That is, One W = 1 J/1 S **(1)**

Section E (Case Study based Questions)

37. (i) a (ii) a (iii) b (iv) a **(Each 1 mark)**

38. (i) a (ii) b (iii) d (iv) b **(Each 1 mark)**

39. (i) c (ii) d (iii) a (iv) d **(Each 1 mark)**