SUMMATIVE ASSESSMENT EXAMINATION, 2017-18
Subject : Science   Class : IX

Time : 3 Hrs.Max.   Marks : 80

Q. 1. A person travells 6 Km. in a circular path and reaches back on the starting point. Calculate the displacement.   1

Ans. Displacement is zero because starting point of the journey and ending point of the jouney is same.

Q. 2. Write names of solutions used to stain plant cell and animal cell white making a slide.   1

Ans. Safranim is used to stain plant cell.
Methalene blue is used to stain animal cell.

Q. 3. Recognise the phyium of animals on the basis of characteristics given. below. Also write one examples of each.   2
(a) Coelom is filled with blood and legs and jointed.

Ans. Phylum-Arthropoda-eg-Housefly, butterfly, spider etc. The animals have coelom filled with blood and jointed legs.
(b) These animal are free living or parasite and these are called flat worms.

Ans. Platyhelminthes is the phylum of flat worms. They are free living or parasite. example: planaria, liver fluke.

Q.4. How does endocytosis help is single celled organism like amaeba?   2

Ans. Amoeba is a unicellular organism. All the processes of living being are performed in this organism. Plasma membrane is flexible. So amoeba can take its food from surroundings. This process is called endocytosis.

Q. 5. Write one word for the following:—
(a) A group of cells having structure in which cells are arrnaged in a special order to perform a work.
(b) The process of taking permanent shape and size to perform a special function.
(c) Animal tissue which attaches muscles to bone.
(d) Kindly shaped cells surrounding the stomata.

Ans. (a) Tissue
(b) Differentiation
(c) Tendors.
(d) Guard cells.

Q. 6. (a) Explain the law of conservation of energy.
(b) Give one example of each energy transformation:—
(i) Heat energy to mechanical energy.
(ii) Mechanical energy to electric energy.

(c) A person is standing from 20 minutes with heavy weight on his head. Does he do any work or not? explain.

Ans. (a) According to conservation of energy,"Energy can neither be created nor destroyed". It can be transformed from one form to it's another form. Total energy before and after transformation remains the same.

(b) (i) Heat is formed by burning of fuel in an engine. This heat energy is converted into mechanical energy.

(ii) In an electric generator. Mechanical energy is converted into electrical energy.

Q. 7. (a) An electric heater of 2000 walt is working for 5 hours. How much energy it consume?

(b) Convert commercial unit of energy into S.I. unit of energy.

Ans. (a) Power of electric heater (P) = 2000 w

Time of use (T) = 5 Hr

Consumed energy (E) = P × t = 2000 × 5 wh = $\frac{2000}{1000}$ kw × 5h

= 10 Kwh.

(b) Commercial unit of energy = 1 Kwh

S.I. unit of energy = 1 Joule

1 Kwh = 1000 × 60 × 60 ws = 3.6 × 106 Joules.

Q. 8. (a) Draw a diagram showing Rutherford's αrays scattering experiments".

(b) Why rutherford used gold foil in above said experiment?

Ans. (a)

Majority of α rays

Few α rays
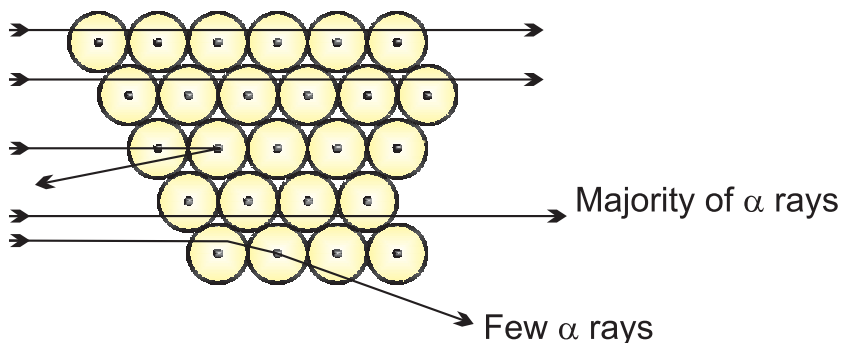
(b) Rutherford choose gold foil because they want a very thin layer. Thickness of gold foil is equal to the thickness of 1000 atom put together.

Q. 9. The number of neutrons and protons in the nucle of two atoms A and B is as follow :

	A	B
Proton	8	8
Nuetron	8	10

(a) Write atomic mass of A and B.

(b) Write the relationship between A and B.

(c) Write electronic configuration of atom A and B.

Ans. (a) Both A and B have same number of electrons, so they have same electonic configuration = 8 = 2, 6

Q. 10. Differentiate the following (Write one difference)

(a) Gynmosperm and angiosperm

(b) Birds (Aves) and mammlas.

(c) Monocotyletons and dicotyledons plants.

Ans. (a) Angiosperm are flowering plants in which seeds are found inside the fluits. In gymnosperms seeds are naked.

(b) Birds are oviparous animals with dry skin covered by feathers and wings. Their forelimbs are modified into wings. Mammals are viviparous (except some exceptions) with sweat and oil glands on their skin.

(c) In monocotyledons plants seeds contain only one cotyledon while in dicotyledons plants seeds contain two cotyledons.

Q. 11. What is formula unit mass? How does it calculated ?

Calculate the formula unit mass of a compound $Na_2S_2O_3$. (Na = 23u, S = 32u, O = 16u)

Ans. Formula Unit Mass:—It is the sum of atomic mass of ions of atoms present in formula for a compound.

Formula unit mass of $Na_2S_2O_3$ = (2 × Na atomic mass) + (2 × S atomic mass) + (3 × O atomic mass)

$$= (2 \times 23) + (2 \times 32) + (3 \times 16)$$
$$= 1584 \text{ u.}$$

Q. 12. Give Reasons:—

(a) When a ball droped from a height, its speed continuously increased.

(b) When we stop pedalling a bicycle, its speed slows down.

(c) When a tree is shaken vigorously, its fruits and leaves fall down.

Ans. (a) When a ball is droped from a height. Its speed continuously increased due to force of gravity (accelertion due to gravity increase on coming downwards).

(b) When we stop pedalling a bicycle, its speed slows down due to air resistance and force of friction between type of bicycle and surface of road. So retardation force is created which stop the bicycle.

(c) When tree is shaken. It moves to and slightly but its fruits and leave tends to remain at rest due to their inertia and hence detached from the tree and fall down.

Q. 13. Cattle farming. poultry and fish farming are included in animal husbandry. What is the need of animal husbandry.

Ans. Management of cattle farming is known as animal husbandry. It includes various tasks such as giving food to cattles, animals, shelter, breeding, health, disease control and proper economic utilization. Animal farming includes cow, buffalo, goat, sheep, camel, poultry, and fisheries. Due to increasing population, demand for milk, eggs, meat etc is also increased. Now farmers take up animal husbandry on commercial basis so it needs scientific management practices. cattle farming is done for milk and agricultural work. By poultry we increase meat an eggs production. fisheries is a cheap source of protein food.

Q. 14. Give Reason:—

(a) Meristematic cell contains dense or abundant cytoplasm a single large nucleus but no vacuole.

(b) In sclerenchyma tissue intercellular space is absent in between the cells.

(c) In xerophytic plants, epidermis is covered with cutin.

Ans. (a) Cells of meristems divide continously and help in increasing the length and girth of the plants, so they have abundant cytoplasm and prominent nucleus, thin cell wall but no vacuoles. Vacuole is like a bag which store or liquid substances. Meristematic cells do not have stared food in them.

(b) In sclernchyma tissue intercellular space is absent in berween the cells because these cells are dead and cell walls are thicked due to deposition of lignin which acts as cement.

(c) In xerophyte plants, epidermis is covered with cutin. Cutin is a layer which resists transport of water through it. Desert have a little water. Cutin protects cells form dryness and also check transpiration from leaves.

Q. 15. A bike is moving with a velocity of 90 Km/hr. After applying break it stop in 5 sec. Calculate the force applied by breaks. Mass of motercycle and rides is 200 Kg.

Ans. Mass of motorcycle and rider   m = 200 Kg

Initial velocity $u = 90 \text{ Km/h}^{-1} = 90 \times \dfrac{5}{18}$

Final Velocity of motor cycle   v = 0

Time   (t) = 5s

Acceleration $\qquad a = \dfrac{u - v}{t}$

Force $\qquad\qquad F = ma$

$\qquad\qquad\qquad F = \dfrac{200 \times (0 - 25)}{5} = -1000 \text{ N}$

Q. 16. With the help of a labelled diagram show nitrogen cycle in nature. Name two molecules essential to life which contain nitrogen. Explain any two processes involved in the cycling of nitrogen in the environment.

Ans. Various steps of nitrogen cycle are :
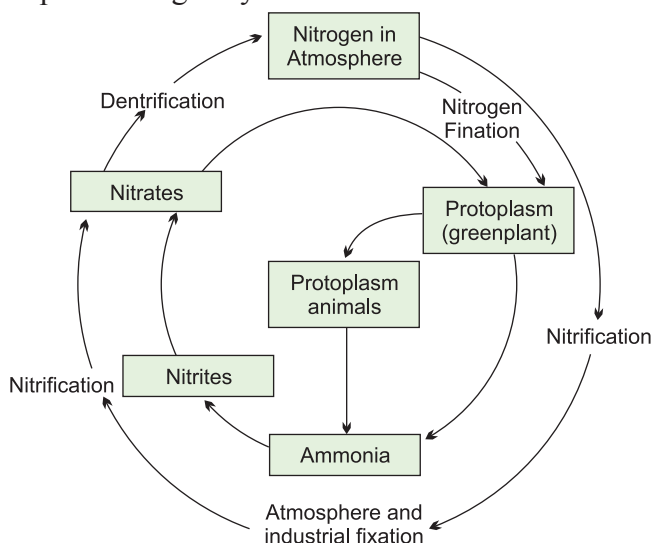
Two molecules essential to life which contain nitrogen are:

(i) Nucleic acids

(ii) Some vitamins.

Two processes involved in the cycling of nitrogen in the environment are:

1. Nitrogen fixing bacteria are formed in the roots of legumes. These bacteria fix atmosperic nitrogen in the form of nitrates and nitrites which can then be used by plants.

2. Fixation of nitrogen by lightning—Dutring lightning, the high temperatures and pressures created in the air convert nitrogen into oxides of nitrogen. These oxides dissolve in water to give nituie and nitrogen acids and fall on land along with rain. These are then utilised by various like forms.

Q. 17. (a) Name three diseases against which immunisation vaccines are available.

(b) State in brief the principle of immunisation.

(c) Why do we not need to immune many infants in our country (below the age of 5) against Hepatitis A?

Ans. (a) 1. Polio.

2. Measles

3. Tetanus

(b) When the immune system first seen an imfections microbe, it responds against this and then remembers it specifically. The next time when that particular microbe or its close relatives enter the body, the immune system responds more vigorously. This eliminates the infection more quickly than the first time around. This is the principle of immunisation.

(c) Because they have already been enposed to hepatitis. A virus through contaminated water and gone immune to it.

Q. 18. What is:

(a) Wave Length

(b) Frequency

(c) Amplitude.

Write its S.I. units. Derive the retaltionship between speed, wavelength and frequency.

Ans. (a) Wave Length: The distance berween two consecutive compressions (C) or two consecutive rare factions (R) is called wavelength. The wave length is represented by λ (Lambda). Its S.I. unit is meter (m).

(b) Frequency: The number of oscillations per unit time is called frequency of the sound wave. It is represented by v (nu). Its S.I. unit is hertz (Hz).

(c) Amplitude: The maximum displacement of the particles of the medium from their original undisturbed position, When a wave passes through a medium is called amplitude. It is represented by the letter A. The SI unit of amplitude of sound wave is the unit of density.

Relationship between speed, wavelength and frequency

Distance travelled m/s is speed

$$V = \frac{\text{Distance travelled by one complete wave}}{\text{Time taken to complete one wave}}$$

$$= \frac{\lambda}{Ts}$$

$$V = \frac{\lambda}{T} = \lambda v \qquad \left(\frac{1}{T} = v\right)$$

$$V = \lambda v$$

Wave speed = wave length × frequency

Q. 19. (a) What is the physical state of water at:

(i) 250ºC   (ii) 100ºC   (iii) 0ºC

(b) Convert the following temperature to the celsius selae:

(i) 298 k   (ii) 300 k   (iii) 280 k

Ans. (a)

(i) 250ºC — Gas

(ii) 100ºC — Gas

(iii) 0ºC — Solid

(b)

(i) 298 k = 298 – 273 = 25ºC

(ii) 300 k = 300 – 273 = 27ºC

(iii) 280 k = 280 – 273 = 7ºC

Q. 20. A student was given mixture of iron filling and sulphur on heating the mixture . Observe the following:

(a) What was the colour of compound.

(b) Write magnetic effect on the mixture.

(c) Write the reaction between carbon disulphite and mixture.

(d) On adding dilute sulphuric acid or dilute, hydrochoric acid what will happen?

Name the gas obtained and write two properties.

Ans. (a) When mixture of iron filling and sulphur is reated iron sulphide is obtained which is black in colour.

(b) Iron does not get attracted to a magnet from a mixture of reated iron fillings and sulphur powder.

(c) No reaction on carbon disulphide and mixture.

(d) On adding dilute hydrochoride acid. The gas obtained is hydrogen sulphide (H_2S).

(i) It is colourless gas.

(ii) It smells like rotten eggs.

Q. 21. (i) If a man jumps out from a boat, the boat moves backwards. Why?

(ii) Explain our walking in terms of Newton's third law of motion.

(iii) A bullet of mass 10 g travelling horizontally with a velocity of 150 ms^{-1} strikes a stationary wooden block and comes to rest in 0.03 S. Calculate the distance of penetration of the bullet into the block.

Ans. (i) When a man jumps out of a boat to the bank of the river, he applies a force in the forward direction. Due to the reaction of this boat moves backward (i.e. away from the bank).

(ii) When we walk on the ground, our foot pushes the ground backward (action) and in return the ground pushes our foot forward (reaction). The forward reaction enerted by the ground on our foot makes us walk forward.

(iii) Mass of bullet   m = 10 g = $\frac{10}{1000}$ kg = 0.01 kg

Initial velocity,   u = 150 ms^{-1}

Final velocity,   v = 0

        Time taken = 0.03 sec

Then, acceleration.

$$a = \frac{v-u}{t} = \frac{(0-150)}{0.03} = -500 \text{ ms}^{-2}$$

By third law of motion, $v^2 - u^2 = 2as$

$$s = \frac{v^2 - u^2}{2a} = \frac{(0)^2 - (150)^2}{2 \times (-5000)} = \frac{-150 \times 150}{-2 \times 5000}$$

        = 2.25 m

SECTION - B

Q. 1. Mention the type of thermometer that should be used to determine the melting point of ice in laboratory? What should be the position of bulb in thermometer?

Ans. Thermometer of range of 0-100 mL is used to determine the melting point of ice laboratory. Bulb of thermometer should remain the ice cubes.

Q. 2. Deepti was asked to prepare four separate mixtures in four beakers A, B, C, & D by mixing sugar, fine sand, thin paste of starch and chalk powder respectively in water and then categories each as stable or unstable. What will be the corred categorization?

Ans. Sugar (stable), fine sand (unstable), thin paste of starch (stable) and chalk powder (unstable).

Q. 3. Fore limbs of birds are modified. Give reasons.

Ans. Fore limbs of birds are modified into usings for flying. They have an outer covering of feathers and hollow bones that help them to fly.

Q.4. Name the technique by which we can prepare a colloidal solution of starch in water.

Ans. Take about 0.5 gm of starch in a china dish. Pour about 10 mL of distilled water. stir the contents with a glass tube continuously. Heat the water. In this way colloidal solution of starch in water is formed.

Q. 5. Mention the two precaution to determine the boiling point of water in laboratory.

Ans. (i) The position of bulb should be slightly above the water level.

(ii) Stir the water continously in beaker so that temperature should remain constant.

Q. 6. Four students A, B, C, & D in a group take 6m long slinky and produce a longitudinal wave, they observe that in 10 sec, 4 waves completed. On these observation the speed of wave in slinky is

(a) 4.8 m/s   (b) 6.4 m/s   (c) 7.2 m/s   (d) 9.6 m/s

Ans. (a) 4.8 m/s

Explanation:

Total distance covered by wave in slinky to cover 4 forth backward motion

$$S = 4 \times 2 \times 6 = 48 \text{ m}$$

Total time taken (t) = 10 s

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$= \frac{48 \, m}{10 \, s}$$

$$= 4.8 \text{ ms}^{-1}$$