

## 10<sup>th</sup> Class Exam 2018 SAMPLE PAPER -2

Time Allowed: 3 hours

Subject: Science

Maximum marks: 80

### General Instructions

- (1) Question numbers 1 and 2 in Section-A are one mark question. They are to be answered in one word or in one sentence.
- (2) Question numbers 3 to 5 in Section - A are two marks questions. These are to be answered in 30 words each.
- (3) Question numbers 6 to 15 in Section - A are three marks questions. These are to be answered in about 50 words each.
- (4) Question numbers 16 to 21 in Section - A are 5 marks questions. These are to be answered in 70 words each.
- (5) Question numbers 22 to 27 in Section - B are based on practical skills. Each question is a two marks question. These are to be answered in brief.
- (6) There is no overall choice. However, there is an internal choice in two questions of three marks each and one question of five marks.

### Section A

**1. An elements 'A' has atomic number 16. To which group and period does it belong?**

Ans. 2,8,6 6<sup>th</sup> group 3<sup>rd</sup> period

**2. What is the phenotype ratio of a dihybrid cross in F2 generation?**

Ans. 9:3:3:1

**3. Name a hormone secreted by a) Pancreas and b) Pituitary. Write one function of each of the hormone.**

Ans: (a) Pancreas secretes hormone insulin. It helps in regulating the blood sugar level.

(b) Pituitary secretes growth hormone. It regulates growth and development of the body.

**4. The power of a lens is 2.5 diopter. What is the focal length and the type of lens?**

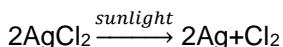
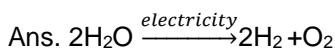
Ans.  $2.5 = 1/F$  so,  $F = \frac{1}{2.5} \times 100\text{cm} = 40\text{cm}$

**5. a) What is food chain? b) Why does a food chain generally consist of only three or four steps?**

**Ans. One who eats what in the environment make up food chain.**

The loss of energy at each step is so big that a very little usable energy is left after three or four trophic levels to support the next trophic level.

**6. Give balanced chemical equations for each of the decomposition reaction carried out with the help of: (a) electricity (b) heat (c) sunlight.**



**7. (a) How is Plaster of Paris chemically different from gypsum? b) How can they be interconverted?**

**(c) Write any two uses of Plaster of Paris.**

Ans. A. Chemical formula of Plaster of Paris is  $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$  Whereas the Chemical formula of Gypsum is  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

(b) Gypsum can be heat over 312°C to get POP.

POP is used by doctors when a patients has got a fracture or a sprain

OR,

**Give reasons for the following:**

(a) Dry HCl does not change the colour of dry litmus paper.

(b) Aqueous solution of an acid conducts electricity.

c) A tarnished copper vessel begins to shine again when rubbed with lemon.

Ans.(a) The colour of litmus paper changes only in the presence of ions like hydrogen ( $H^+$ ) or hydronium ( $H_3O^+$ ) ions. HCl can produce these ions only in the form of aqueous solution. Hence dry HCl gas does not change the colour of dry litmus paper.

(b).In Aqueous solution HCl release  $H^+$  and  $Cl^{-1}$  that conductor electricity.

(c) On rubbing CuO react with acid and form salt.

**8. A jeweler made jewellery of 22 carat gold and also charged his customers for the rate of 22 carat gold. His business grew due to this act.**

a) Why can't we make jewellery out of 24 carat gold?

b) Name two metals that can be added to make jewellery.

c) What value of the jeweler is seen in the above act?

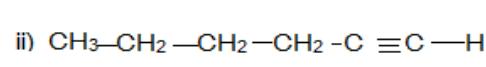
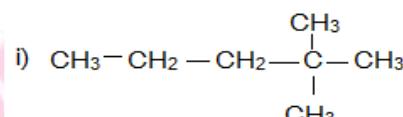
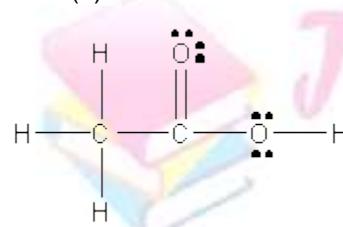
Ans. (a) The purest form of gold is 24 carat and in actual the gold is very soft so can take any shape while in purest form that's why any other metal is added to gold to make it hard.

(b) Metals like platinum, silver, copper etc. can be added to gold to make gold alloys.

(c) Jewelers are expert in their work and know many things related to jewellery metals.

**9. (a) Draw the electron dot structure of ethanoic acid ( $CH_3COOH$ ). (b) Give the IUPAC names of:**

Ans: (a)



(b) (i)2,2 dimethyl pentane (ii) Hexyne

**10. Given below are some elements of the modern periodic table. Atomic number of the elements are given in the parentheses: A (4), B (9), C (14), D (19), E (20).**

a) Select the element that has one electron in the outermost shell. Also, write the electronic configuration of this element.

b) Which two elements amongst these belong to the same group? Give reason for your answer.

c) Which two elements amongst these belong to the same period? Which one of the two has bigger atomic radius?

Ans. (a) Among the given elements, D(19) has one electron in the outermost shell.

Its electronic configuration is 2, 8, 8, 1.

(b) Among the given elements, A(4) and E(20) have two electrons in their respective outermost shells.

Electronic configuration of A: 2, 2

Electronic configuration of E: 2, 8, 8, 2

They both have a valency of two. Thus, they belong to group 2 of the periodic table.

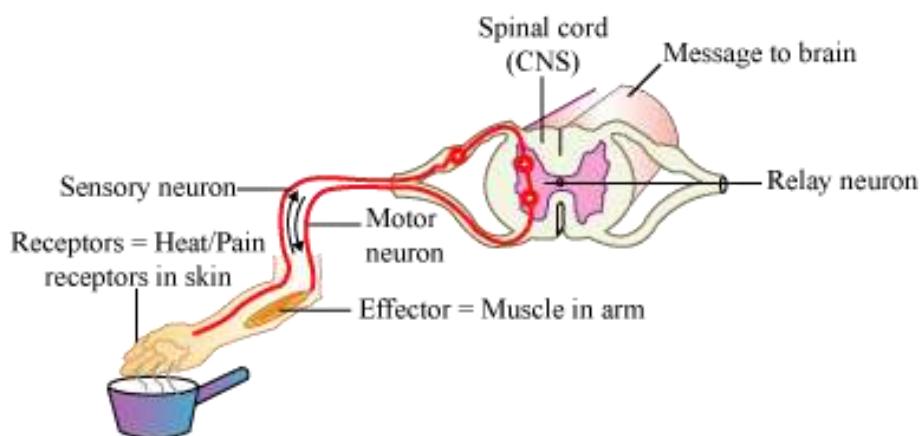
(c) Among the given elements, A(4) and B(9) belong to period 2 and elements D(19) and E(20) belong to period 4 of the periodic table.

Also, as the atomic radii of elements decrease on going from left to right in a period because of increase in the effective nuclear charge that pulls the outermost electron closer to the nucleus, A(4) has a bigger atomic radius than B(9) and D(19) has a bigger atomic radius than E(20).

### **11. What is reflex arc? Make a flow diagram of the components in a reflex arc.**

Ans. The pathway followed by nerve impulses to transmit the message to the receptors and then carry it back to the effector muscle cells in response to a stimuli is called reflex arc.

#### DIAGRAM:



Nerve impulses travel in one direction only because nerve cells only have neurotransmitter storage vesicles going one way and receptors in one place.

### **12. The genotype of green-stemmed tomato plants is denoted as GG and that of purple-stemmed tomato plants as gg.**

**When these two are crossed:**

- What color of stem would you expect in their F<sub>1</sub> progeny?
- Give the percentage of purple-stemmed plants if F<sub>1</sub> plants are self pollinated.
- In what ratio would you find the genotypes GG and Gg in the F<sub>2</sub> progeny?

Ans.

- The F<sub>1</sub> will be Gg so it will be green stemmed.
- F<sub>2</sub> plants obtained by selfing of F<sub>1</sub> will be having 25% purple stemmed plants (gg), rest will be green (GG, Gg).
- The ratio of genotype GG and gg will be 1 : 2

### **13. List two causes leading to myopia of the eye. Draw ray diagrams to show the image formation in case of defective eye and corrected eye.**

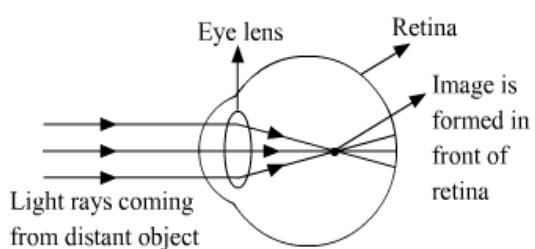
Ans. Myopia (or short-sightedness) is that defect of vision due to which a person cannot see the distant objects clearly (though he can see the nearby objects clearly). The far point of an eye suffering from myopia is less than infinity.

The defect of eye called myopia (or short-sightedness) is caused:

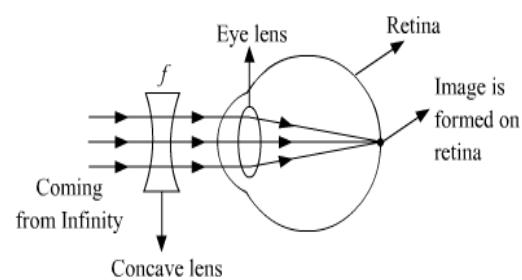
- due to high converging power of eye-lens (because of its short focal length), or
- due to eye-ball being too long.

Myopia (short-sightedness or near-sightedness) is corrected by using spectacles containing concave lenses.

**1. Defective eye**



**2. Corrected eye**



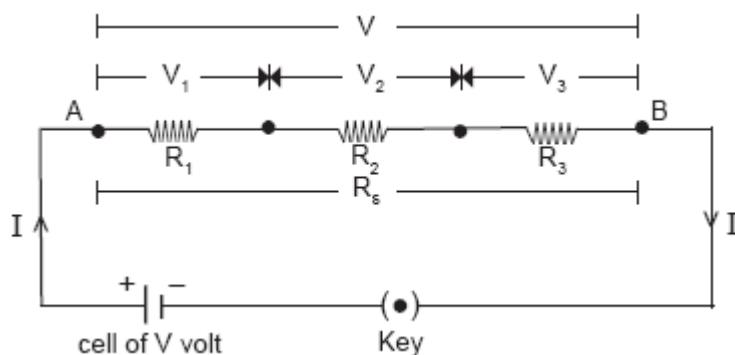
**14. Derive the relation  $R = R_1 + R_2 + R_3$  when three resistors  $R_1$ ,  $R_2$  and  $R_3$  are connected in series.**

Ans: We know that the current in all the resistors in a series combination is the same.

And potential difference  $V = V_1 + V_2 + V_3 \dots$  (i)

$$V = IR \Rightarrow V_1 = IR_1, V_2 = IR_2, V_3 = IR_3$$

Substituting the values in (i)  $IR = IR_1 + IR_2 + IR_3 \Rightarrow IR = I(R_1 + R_2 + R_3) \Rightarrow R_s = R_1 + R_2 + R_3$



**15. State the rule to determine the direction of a:**

(a) Magnetic field produced around a straight conductor carrying current.

(b) Force experienced by a current carrying straight conductor placed in a magnetic field which is perpendicular to it and

(c) Current induced in coil due to its rotation in a magnetic field.

Ans. (i) Right hand thumb rule (ii) Fleming's left hand rule (iii) Fleming's right hand rule

16. (a) List two characteristic features of carbon which when put together give rise to a number of carbon compounds.

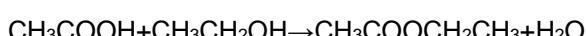
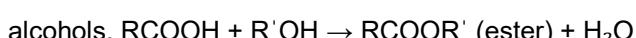
(b) Name the simplest hydrocarbon and write its formula.

c) What is an ester? Write its preparation with the help of a balanced chemical equation.

Ans: (i) The two characteristics are: Tetravalency, Catenation

(ii) Simplest hydrocarbon is - Methane. Formula -  $\text{CH}_4$

Esters are sweet smelling compounds of general formula  $\text{RCOOR}'$ , formed by the reaction of carboxylic acids with alcohols.



**17. a) What is blood pressure?**

b) Write two differences between aerobic respiration and anaerobic respiration.

c) Why is the rate of breathing in aquatic organisms much faster than in terrestrial organisms?

OR

a) Name an instrument which is used to measure blood pressure?

b) Write two differences between an artery and a vein.

**c) Why do veins have thin walls as compared to arteries?**

Ans.(a) The pressure with which the blood flows in the blood vessels is known as blood pressure. This pressure is created by relaxation and contraction of heart in blood vessels.

(b) Aerobic respiration takes place in the mitochondria and requires oxygen and glucose, and produces carbon dioxide, water, and energy. The chemical equation is  $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$  (glucose + oxygen -> carbon dioxide + water).

Anaerobic respiration also produces energy and uses glucose, but it produces less energy and does not require oxygen.

Aerobic respiration takes place in the cell cytoplasm and produces lactic acid.

The chemical equation is  $C_6H_{12}O_6 \rightarrow 2C_3H_6O_3$  + Lactic acid.

(c) Aquatic animals take in the oxygen dissolved in water. The amount of dissolved oxygen in water is fairly low compared to the amount of oxygen in the air. Therefore, rate of breathing in aquatic organisms is much faster than in terrestrial organisms.

Or, (a) sphygmomanometer

(b) (i) Arteries have thick, elastic, muscular walls whereas veins have thin walls with few elastic fibres.

(ii) Veins have one-way valves whereas arteries do not have any valves

(iii) Arteries carry oxygenated blood away from the heart to the body, and veins carry oxygen-poor blood back from the body to the heart

(c) The blood in veins is under lower pressure than the blood in arteries.

**18. a) What is regeneration? b) Write any two advantages of vegetative propagation.**

**c) Draw the diagram of a flower and label the following parts: (a) sepal (b) petal c) anther d) ovary.**

Ans.(a) The process by which some organisms replace or restore lost body parts is called regeneration.

(b) Advantages of vegetative propagation are: (i) We can grow new plants in short time by vegetative propagation.

(ii) New plants are exact copies of the parent plants (iii) We can grow new plants which have no seeds or less seeds.

© see NCERT

**19. a) State Snell's law of refraction.**

**b) An object of size 7.0 cm is placed at 27 cm in front of a concave mirror of focal length 18 cm. At what distance from the mirror should a screen be placed, so that a sharp focused image can be obtained? Find the size and the nature of the image.**

Ans.(a) According to the Snell's law., The ratio of sine of angle of incidence to the sine of angle of refraction is constant. sine of angle of incidence(i)/sine of angle of refraction(r)= constant.

(b) We have, concave mirror , Object placed, distance (u) = -27 cm , focal length (f) = -18 cm

$$\text{We know, } \frac{1}{f} = \frac{1}{u} + \frac{1}{v} \text{ or, } \frac{1}{-18} = \frac{1}{-27} + \frac{1}{v} \text{ or, } \frac{1}{v} = \frac{1}{18} + \frac{1}{27} \text{ or, } v = -54 \text{ cm}$$

Hence image formed at distance -54 cm

$$\text{we know, Magnification (m) } = - \frac{\text{image distance}(v)}{\text{object distance}(u)} = \frac{\text{Image height} h_2}{\text{Object height } (h_1)} \text{ where, object height } (h_1) = 7 \text{ cm}$$

$$\text{Therefore, } -\frac{54}{-27} = \text{Image height } \frac{h_2}{7} \Rightarrow \text{or, Image height } (h_2) = \frac{-(54) \times 7}{-27} = -14 \text{ cm}$$

So, Image is formed on the same side as that of the object, since, negative sign indicated. The size of the image is 14 cm and inverted.

**20. (a) Why is tungsten metal selected for making filaments of incandescent lamps?**

(b) Power of a lamp is 60 W. Find the energy in joules consumed by it in 1 s.

(c) Draw a schematic diagram of a circuit consisting of a battery of three cells of 2 V each, a  $5\ \Omega$  resistor, an  $8\ \Omega$  resistor and a  $12\ \Omega$  resistor, an ammeter and a plug key, all connected in series.

Ans.(a) Tungsten metal is selected for making filaments of incandescent lamp bulbs because it can sustain high temperatures, i.e., it has a high melting point.

(b) Electric energy consumed in 1s, So,  $E = P \times t = 60 \times 1 = 60$  joule

**21. a) Compare the advantages of ground water over water available from the sources on the surface of earth.**

**(Mention any two points) b) Why are the Arabari forests of Bengal known to be a good example of conserved forest?**

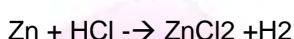
Ans.(a) The advantages of ground water is that the ground water is preserved for long time and it doesn't polluted by human beings & it can be used in future.

(b) A forest officer involved the villagers of the area around the forest in the conservation. In return for help in protecting the forest, the villagers were given employment in both silviculture and harvesting operations and were allowed to collect firewood and fodder from the forest area on a nominal payment. With the active and willing participation of local people living around the forest, the degraded sal forest of Arabari became thick and green with ten years. Thus the Arabari forests of West Bengal are known to be a good example of conserved forest.

## Section-B

**22. a) Name the reaction which takes place between Zn and HCl. (b) Why is it so called?**

Ans. Displacement reaction . Here Zn is more reactive than H and so Zn replace H from HCl and form  $ZnCl_2$



**23. Write two properties of acetic acid.**

Ans. Soluble in water and form homogeneous mixture.

(i) it turns blue litmus to red    (ii) it is Colourless    (iii) 5 per cent acetic acid in water is mixture when sodium hydrogen carbonate is added hydrogen gas is released

**24. Mention any two precautions while doing an experiment to verify Ohm's law.**

Ans. Precautions

(i) Avoid touching any wire by hand, when current is on.

(ii) Switch off supply of current, when not needed.

**25. a) What is the unit of refractive index?**

**b) What will be the angle of emergence if a ray of light strikes the rectangular glass slab at an angle of 40 deg.**

Ans. (a) The index of refraction does not have units. It is the ratio of the speed of light in various mediums so the units cancel out. It is unitless.

(b) The ray of light coming out is parallel to the incident ray and the angle of emergence is the same as the angle of incidence.

**26. Draw the diagram of stomata when open and label it. Ans: See NCERT**

**27. What is budding? Give any two examples of organisms in which reproduction occurs through budding.**

Ans. Budding is a type of asexual reproduction in which a new organism develops from an outgrowth or bud due to cell division at one particular site.

Yeast, Flatworm.