Sample Question Paper 2017-18
Science
Class – X

Time allowed: 03 Hours **Maximum Marks: 80**

General Instructions:

(i) The question paper comprises two sections, A and B. You are to attempt both the sections.
(ii) All questions are compulsory.
(iii) All questions of Section-A and B are to be attempted separately.
(iv) There is an internal choice in two questions of three marks each and one question of five marks.
(v) Question numbers 1 and 2 in Section-A are one mark question. They are to be answered in one word or in one sentence.
(vi) Question numbers 3 to 5 in Section- A are two marks questions. These are to be answered in 30 words each.
(vii) Question numbers 6 to 15 in Section-A are three marks questions. These are to be answered in about 50 words each.
(viii) Question numbers 16 to 21 in Section-A are 5 marks questions. These are to be answered in 70 words each.
(ix) 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.

	SECTION – A	
1	Give an example of a flower which contains both stamens and carpels.	1
2	Mention any one point of difference between Pepsin and Trypsin.	**1**
3.	An element "X" has mass number 35 and the number of neutrons, is 18. Identify the group number and period of "X".	2
4.	An object of height 1.2m is placed before a concave mirror of focal length 20cm so that a real image is formed at a distance of 60cm from it. Find the position of an object. What will be the height of the image formed?	2
5.	Why is there a need to harness non-conventional sources of energy? Give two main reasons.	2
6	Name the electric device that converts mechanical energy into electrical energy. Draw the labelled diagram and explain the principle involved in this device. OR i) What is the function of earth wire in electrical instruments? ii) Explain what is short circuiting an electric supply. iii) What is the usual current rating of the fuse wire in the line to feed (a) Lights and fans? (b) Appliances of 2kW or more power?	3
7	Draw a circuit diagram of an electric circuit containing a cell, a key , an ammeter , a resistor of 4Ω in series with a combination of two resistors (8Ω each) in parallel and a voltmeter across parallel combination. Each of them dissipate maximum energy and can withstand a maximum power of 16W without melting. Find the maximum current that can flow through the three resistors.	3
8	In the electrolysis of water, a) Name the gas collected at anode and cathode b) Why is the volume of gas collected at one electrode double than the other? c) What would happen if dil H_2SO_4 is not added to water?	3
9	Differentiate between the arrangement of elements in Mendeleev's periodic table and Modern periodic table.	3

10	Explain the ways in which glucose is broken down in absence of oxygen. OR List three differences between arteries and veins.	3
11	How do Mendel's experiments show that traits may be dominant or recessive?	3
12	Rohit focused the image of a candle flame on a white screen using a convex lens. He noted down the position of the candle , screen and lens as under : Position of candle = 26.0 cm Position of convex lens = 50.0 cm Position of screen = 74.0 cm i) What is the focal length of the convex lens? ii) Where will the image be formed if he shifts the candle towards the lens at a position of 38 cm? iii) Draw a ray diagram to show the formation of the image in case (ii) as said above?	3
13	"pH has a great importance in our daily life" explain by giving three examples. OR A compound which is prepared from gypsum has the property of hardening when mixed with a proper quantity of water. Identify the compound and write its chemical formula. Write the chemical equation for its preparation. Mention any one use of the compound.	3
14	Why are fossils considered important in the study of evolution? Explain two ways by which age of fossils can be estimated.	3
15	Our government launches campaigns to provide information about AIDS prevention, testing and treatment by putting posters, conducting radio shows and using other agencies of advertisements. a) To which category of diseases AIDS belong? Name its causative organism. b) Which kind of value is government trying to develop in the citizens by conducting the above kind of programs.	3
16	With the help of a labelled circuit diagram wire describe an activity to illustrate the pattern of the magnetic field lines around a straight current carrying long conducting wire . i) Name the rule that is used to find the direction of magnetic field associated with a current carrying conductor. ii) Is there a similar magnetic field produced around a thin beam of moving (a) alpha particles and (b) neutrons? Justify your answer.	5
17	You are given balls and stick model of six carbon atoms and fourteen hydrogen atoms and sufficient number of sticks. In how many ways one can join the models of six carbon atoms and fourteen hydrogen atoms to form different molecules of C_6H_{14}. **OR** Draw the structural formulae of all the possible isomers of the compound with the molecular formula C_3H_6O and also give their electron dot structures.	5
18	a) i) Draw a neat diagram of human brain and ii) Label Medulla and Cerebellum iii) Write the functions of the above mentioned parts b) "Both overproduction and underproduction of Growth hormone leads to disorders in the body." Explain	5

<table>
<tr><td>19</td><td>Noopur needs a lens of power -4.5D for correction of her vision.
a) What kind of defect in vision is she suffering from?
b) What is the focal length and nature of the corrective lens?
c) Draw ray diagrams showing the (a) defected eye and (b) correction for this defect.
d) What are the causes of this defect?</td><td>5</td></tr>
<tr><td>20</td><td>a) What is reactivity series? How does the reactivity series of metals help in predicting the relative activities of various metals?
b) Suggest different chemical processes used for obtaining a metal from its oxides for metals in the middle of the reactivity series and metals towards the top of the reactivity series. Support your answer with one example each.</td><td>5</td></tr>
<tr><td>21</td><td>a) “Improvements in our lifestyle have resulted in greater amounts of waste generation.” Give two examples to support the given statement. Suggest one change that we can incorporate in our lifestyle in order to reduce non-biodegradable waste.
b) The following organisms form a food chain.
Insect, Hawk, Grass, Snake, Frog
Which of these will have highest concentration of non-biodegradable chemicals? Name the phenomenon.
OR
a) What do you understand by “Watershed Management”? List any two advantages of watershed management.
b) “Human beings occupy the top level in any food chain.” What are the consequences of this on our body?</td><td>5</td></tr>
<tr><td></td><td>SECTION – B</td><td></td></tr>
<tr><td>22</td><td>What do you observe when you drop a few drops of acetic acid to a test tube containing:
a) Phenolphthalein c) distilled water
b) Universal indicator d) sodium hydrogen carbonate</td><td>2</td></tr>
<tr><td>23</td><td>Riya performs two set of experiments to study the length of the foam formed which are as follows:
Set I: she takes 10 ml of distilled water in test tube “A” and adds 5-6 drops of liquid soap in it and shakes the test tube vigorously.
Set II: she takes 10 ml of distilled water in a test tube “A” and adds 5-6 drops of liquid soap with half spoonful of $CaSO_4$ in it and shakes the test tube. Write your observation and reason.</td><td>2</td></tr>
<tr><td>24</td><td>A student observed a permanent slide showing asexual reproduction in yeast. Draw diagrams of the observations he must have made from the slide. Name the process also.</td><td>2</td></tr>
<tr><td>25</td><td>A student conducted an experiment to show CO_2 is released during respiration. List two precautions that he/she must take for obtaining correct observations.</td><td>2</td></tr>
<tr><td>26</td><td>The values of current I flowing in a given resistor for the corresponding values of potential difference V across the resistor are given below:
<table><tr><td>I (ampere)</td><td>0.5</td><td>1.0</td><td>2.0</td><td>3.0</td><td>4.0</td></tr><tr><td>V (volt)</td><td>1.6</td><td>3.4</td><td>6.7</td><td>10.2</td><td>13.2</td></tr></table></td><td>2</td></tr>
</table>

	Plot a graph between V and I and calculate the resistance of the resistor. OR In a given ammeter, a student sees that needle indicates 17 divisions in ammeter while performing an experiment to verify Ohm's law. If ammeter has 10 divisions between 0 and 0.5A, then what is the value corresponding to 17 divisions?	
27	Draw a path of light ray passing through a prism. Label angle of incidence and angle of deviation in the ray diagram.	2

Marking Scheme 2017 – 18
Science
Class – X

1 Hibiscus/Mustard (or any other correct answer) 1

2 1

Pepsin	Trypsin
• Produced in stomach • Acts in acidic medium	Produced by pancreas Acts in basic medium

(anyone)

3 Atomic number of X = Mass number of X – No. of neutrons =35-18=17 ½
Electronic configuration = 2, 8, 7 ½
Group number = 17 , Period No. = 3 ½
½

4 $h_o = 1.2cm,\ f = -20cm, v = -60cm$

$\frac{1}{u} = \frac{1}{f} - \frac{1}{v}$ ½

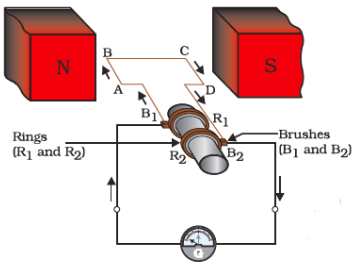
$\frac{1}{u} = \frac{1}{-20} - \frac{1}{-60}$ ½

$\frac{h_i}{h_o} = \frac{-v}{u}$ ½

$h_i = -\frac{-60}{-30} x1.2 = -2.4cm$ ½

5 i) Our demand for energy is increasing to improve quality of life and growth of population 1+1
ii) Fossil fuels are limited (or any other two)

6 Electric generator ½
Principle electormagenetic induction which states that electric current is induced in a closed circuit becaruse of changing magnetic field. 1

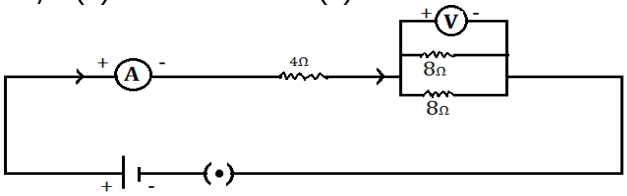


1½

OR

i) Earth wire in electrical instruments saves us from all possible electric shocks. 1+1+1
ii) Accidently, when live and neutral wires of an electric circuit comes into direct contact, it is called shor circuiting.
iii) (a) 5A (b) 15A

7



1

Maximum current through 4 Ω resister $= \sqrt{\frac{P}{R}}$ 1

$$= \sqrt{\frac{16}{4}} = 2A$$

$\therefore$ Maximum current through each 8 Ω resister $= \frac{1}{2} x2 = 1A$ 1

8 a) In the electrolysis of water, the gas collected at cathode is : Hydrogen 1
The gas collected at anode is : oxygen

b) The gas which is collected in double the amount during the electrolysis of water is Hydrogen. This is because water contains two parts of hydrogen element as compared to one part of oxygen element by volume. 1

c) Pure water is a bad conductor of electricity, by adding drops of sulphuric acid; we make it a good conductor of electricity. 1

9

	Mendeleev's Periodic table	Modern periodic table	
1.	The elements were arranged according to increased atomic Masses.	The elements were arranged according to increased Atomic numbers.	1
2.	Position of isotopes was not Justified.	There was no problem in the Placing of isotopes	1
3.	Position of hydrogen was not Justified because it resembles Both with Alkali metals and Halogens.	Hydrogen has been given a unique position due to its resemblance with alkalis and Halogens.	1

10 There are two ways of anaerobic breakdown of glucose. First step is breakdown of glucose molecule into pyruvate which takes place in cytoplasm. 3

The anaerobic breakdown in bacteria is called fermentation. During fermentation pyruvate is broken down to ethyl alcohol and carbondioxide.

When there is lack of oxygen in our muscle cells pyruvate is broken down to lactic acid.
Very less amount of energy is released in both the above cases. 1x3

OR

Arteries carry blood away from the heart while veins carry blood towards the heart.

Arteries are thick walled while veins are thin walled.

Valves are absent in arteries while valves are present in veins to ensure that blood flows in one direction only. (any other)

(any three) 1x3

11 Mendel conducted a monohybrid cross with pea plants, and he observed that one of the contrasting characters disappears in F_1 generator. This character reappears in F_2 generation (obtained by selfing F_1) in just 25% of the progeny. ½ x 6

Mendel conclude that the character which epresses itself in F_1 is the dominant

character while the other one when is not able to epress thourhg present in F_1 individuals is recessive. This recessive character is able to express only in its pure form i.e. in 25% of F_2 individuals.

12 i)

$$u = 50 - 26 = 24cm$$
$$v = 74 - 50 = 24cm$$
$$\therefore 2f = 24cm$$
$$\therefore f = \frac{24}{2} = 12cm$$

1½

ii)

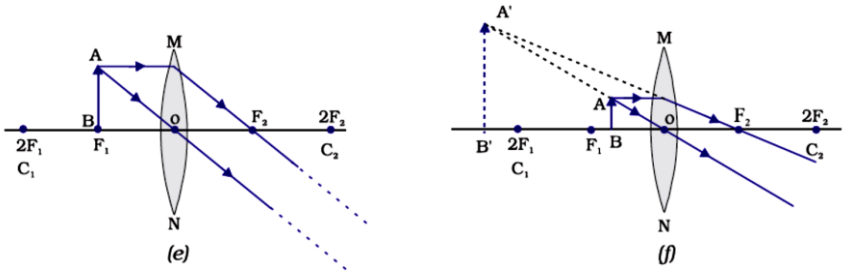
$$u = 50 - 38 = 12cm$$

½

i.e. Candle is at f

∴ Image is formed at infinity.

iii) 1



13 Any three point given above – 1 + 1 + 1

1. Plants and animals are pH sensitive. Living organisms can survive only in narrow range of pH change.
2. pH of the soil. Plants require a specific pH range for their healthy growth.
3. pH in our digestive system. Our stomach produces hydrochloric acid that helps in the digestion of food. During in digestion the stomach produces too much acid that cause pain and irritation.
4. Change in pH causes tooth decay. Tooth decay start when the pH of the mouth is lower than 5.5. Tooth enamel gets corroded when the pH in the mouth is below 5.5.
5. Self-defense by plants and animals through chemical warfare. Bee–sting leaves and acid causing pain and irritation. Applying a mild base like baking soda on the stung area provides relief.

OR ½

The name of the compound is Plaster of Paris ½

Its chemical formula is CaSO4. ½ H2O

Equation: 1

CaSO4.2H2O ----------> CaSO4. ½ H2O + 1 ½ H2O 1

It is used in the hospitals mainly as plaster for supporting fractured bones in the right position

14 Fossils provide evidence in favour of evoluation / establish evolutionary relationships by providing missing links. 1

Two ways

1. Relative method – Fossils found closer to the surface are more recent than those in deeper layer. 1x2
2. By detecting the ratios of different isohpes of the same element in the fossils material.

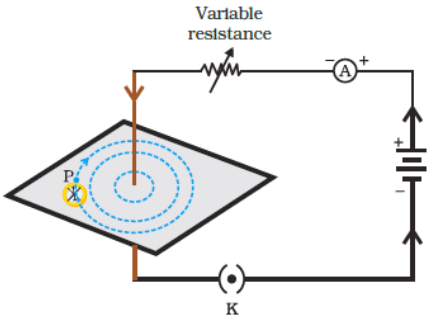
15 a) Viral / STD 1

HIV 1

b) Senstivity and awareness among the citizens towards leading a healthy and fit life. 1

16 Activity (Refer circuit diagram given below) 2

Take a battery (12 V), a variable resistance (or a rheostat), an ammeter (0–5 A), a plug key, and a long straight thick copper wire. Insert the thick wire through the centre, normal to the plane of a rectangular cardboard. Take care that the cardboard is fixed and does not slide up or down. Connect the copper wire vertically between the points X and Y, as shown in diagram in series with the battery, a plug and key. Sprinkle some iron filings uniformly on the cardboard. Keep the variable of the rheostat at a fixed position and note the current through the ammeter. Close the key so that a current flows through the wire. Ensure that the copper wire placed between the points X and Y remains vertically straight. Gently tap the cardboard a few times. Observe the pattern of the iron filings. It is observed that the iron filings align themselves showing a pattern of concentric circles around the copper wire. These represent the magnetic field lines.



1

i) Right hand thumb rule

ii) Yes, Alpha particles being, positively charged constitues a current in the direction of motion.
No, Neutron being electrically neutral consitiute no current. 2

17 C_6H_{14}

(a) $CH_3-CH_2-CH_2-CH_2-CH_2-CH_3$

(b) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-CH_2-CH_3$

(c) $CH_3-CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-CH_3$

(d) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_3$

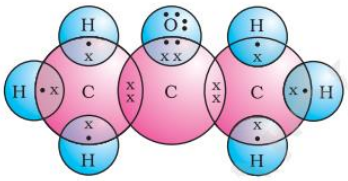
(e) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{\overset{\displaystyle CH_3}{\overset{|}{C}}}}-CH_2-CH_3$

1+1+1+1+1

OR

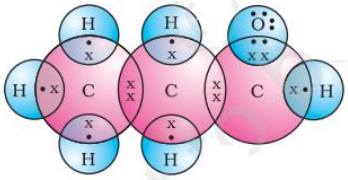
1½+1

1½+1



$CH_3-\overset{\overset{O}{\|}}{C}-CH_3$
Propanone

Electron dot structure of propanone

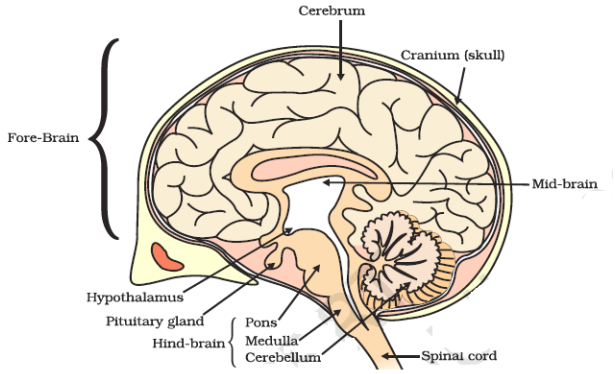


$CH_3—CH_2—CHO$
Propanal

Electron dot structure of propanal

18 a)

i)



2

ii) Correct labelling 1

iii) Medulla controls blood pressure, salivation x vomiting ½+ ½

Cerebellum controls precision of voluntary movements and equilibrium. 1

(any one function each of Medulla and Cerebellum)

b) Over production of growth hormone leads to gigantism and it's underproduction leads to dwarfism

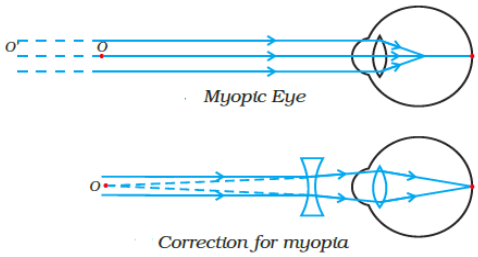
19 a) Myopia 1

b) ½+ ½

$$f = \frac{-1}{45} = -0.22cm$$

Concave lens

c)



1+1

d) Causes – i) Due to excess curvature of eye lens

iii) Elongation of the eye ball. ½+ ½

20 a) The arrangement of metals in the vertical column in the order of decreasing reactivity is called reactivity series or activity series. 5

A metal placed above hydrogen in the activity series will displace

hydrogen from water or acids. A metal placed at the top of the activity series would displace metal below it. Thus a more reactive metal displaces a less reactive metal from its salt solution. 2

b)

i) For obtaining metals that are in the middle of the reactivity series, oxides of such metals can be reduced with coke (carbon) which acts as a reducing agent. 1½
Example: $2\ Fe_2O_3 + 3\ C \longrightarrow 4\ Fe + 3CO_2$

ii) For obtaining metals that are high in the reactivity series, their oxides are reduced to metals by the process of electrolysis
example: electrolysis of sodium chloride
at cathode: $Na^+ + e^- \longrightarrow Na$
at anode: $2\ Cl^- \longrightarrow Cl_2 + 2e^-$ 1½

21 a)

- More use of dispossible items like paper plates, plastic items, polythene etc. 1x2
- Changes in packaging (or any other example)

Suggestion – Reuse of polythene bages, plastic containers. 1
(or any other)

b) Hewk 1
Biomaginification 1

OR

a) Scientific soil and water conservation is called watershed management. Advantages: 1

i) Increases production and income of watershed community.
ii) Mitigates droughts and floods.
iii) Increases the life of downstream dams reservoirs 2
(any two)

b)

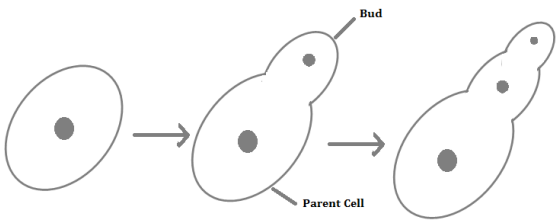
1) Maximum level of bio magnification occurs here because of progressive accumulation. 2
2) We get very small amount of energy as only 10 % of the previous energy gets transferred at each trophic level

SECTION B

22 i) Acetic acid will remain colourless in phenolphthalein ½
ii) Acetic acid will dissolve in distilled water forming a clear solution ½
iii) Universal indicator gives orange colour with acetic acid. ½
iv) Sodium hydrogen carbonate will give brisk effervescence due to the formation of CO_2 gas. ½

23 Set I will have more length of foam because it consist of soft water. 1+1
Set II will form less foam because it consist of hard water due to the presence of $CaSO_4$.

24 ½+½+½



Budding ½

25 1) The set up should be airtight 1x2
2) Germinating seeds (living) should be used

26 Graph 1

$v = 4v(9v - 5v)$

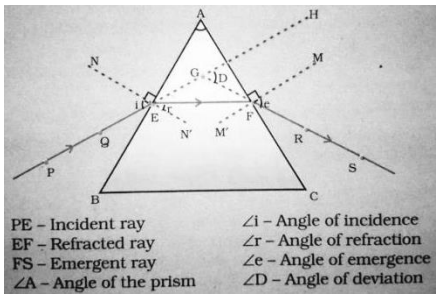
$i = 1.25A(2.65A - 1.40A)$ 1

$$R = \frac{v}{i} = \frac{4}{1.25} = 3.2\Omega$$

OR

An ammeter has 10 divisions between 0 to 0.5A. So,
1 Division = 0.5A /10
17 divisions = 17/20 = 0.85A

27 2



PE – Incident ray
EF – Refracted ray
FS – Emergent ray
∠A – Angle of the prism
∠i – Angle of incidence
∠r – Angle of refraction
∠e – Angle of emergence
∠D – Angle of deviation

QUESTION PAPER DESIGN FOR SCIENCE (CODE NO. 086/090)
Class- IX & X (2017-18)

Time: 3 Hours **Max. Marks: 80**

S. No.	Typology of Questions	Very Short Answer (VSA) 1 Mark	Short Answer -I (SAI) 2 Marks	Short Answer -II (SAII) 3 Marks	Long Answer (LA) 5 Marks	Total Marks	% Weightage
1	**Remembering** (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories, Identify, define or recite, information)	2	-	1	1	10	15%
2	**Understanding** (Comprehension - to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)	-	1	4	2	24	35%
3	**Application** (Use abstract information in concrete situation, to apply knowledge to new situations, use given content to interpret a situation, provide an example, or solve a problem)	-	1	2	2	18	26%
4	**High Order Thinking Skills** (Analysis & Synthesis - Classify, compare, contrast, or differentiate between different pieces of information, Organize and/or integrate unique pieces of information from a variety of sources)	-	-	1	1	8	12%
5	**Inferential and Evaluative** (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	-	1	1+1*	-	8	12%
	Total (Theory Based Questions)	**2x1=2**	**3x2=6**	**10x3=30**	**6x5=30**	**68(21)**	**100%**
	Practical Based Questions (PBQs)		**6x2=12**	-	-	**12(6)**	
	Total	**2x1=2**	**9x2=18**	**10x3=30**	**6x5=30**	**80(27)**	

1. Question paper will consist of 27 questions.
2. All questions would be compulsory. However, an internal choice will be provided in three questions of 3 marks each, two questions of 5 marks each and one question (for assessing the practical skills) of 2 marks.

*One question of 3 marks will be included to assess the values inherent in the texts.