SECOND PREBOARD EXAMINATION (2019-20)

CLASS: X

Subject: **SCIENCE** Date: **09.01.2020**

Time Allowed: 3 Hours Maximum Marks: 80

General Instructions:

1. The question paper comprises three sections – A, B and C. Attempt all the sections.
2. **All** questions are **compulsory**.
3. Internal choice is given in each section.
4. All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.
5. All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50 - 60 words each.
6. All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80 – 90 words each.
7. This question paper consists of a total of 30 questions.

Section A

1.	What is galvanization?	1
2.	How does atomic size of an element vary across a period?	1

3.	**Answer question numbers 3(a) - 3(d) on the basis of your understanding of the following paragraph and the related studied concepts.**	

A solar power plant is any type of facility that converts sunlight either directly, like Photovoltaics, or indirectly, like Solar Thermal plants, into electricity. They come in a variety of 'flavors' with each using discretely different techniques to harness the power of the sun. A solar power plant is based on the conversion of sunlight into electricity, either directly using photovoltaics (PV), or indirectly using concentrated solar power (CSP). Concentrated solar power systems use lenses, mirrors, and tracking systems to focus a large area of sunlight into a small beam. Many are familiar with so-called photovoltaic cells, or solar panels, found on things like spacecraft, rooftops, and handheld calculators.

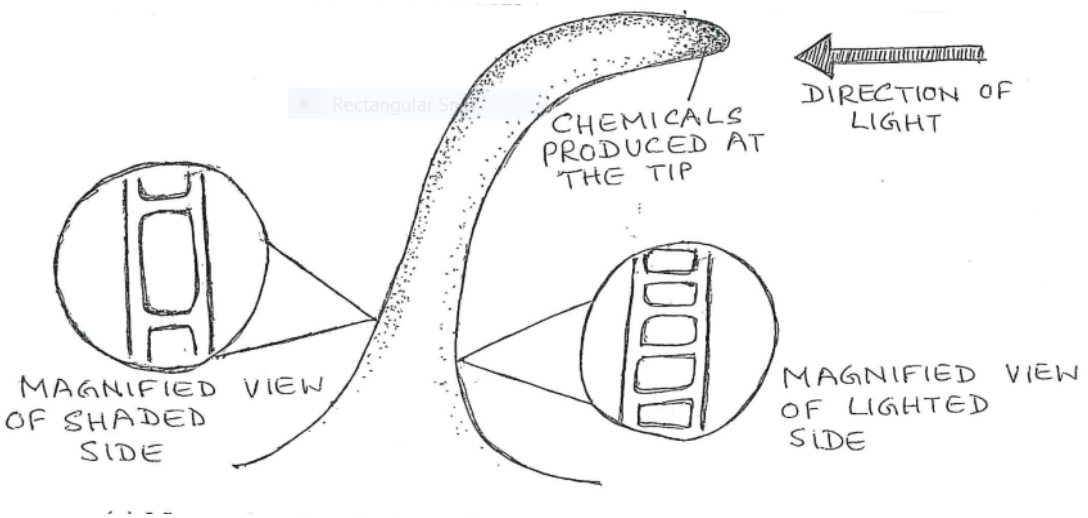
(a) What are solar cell panels?

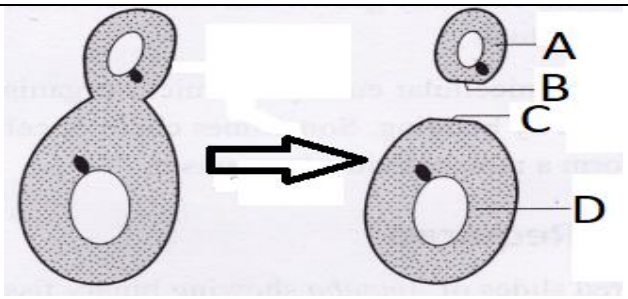
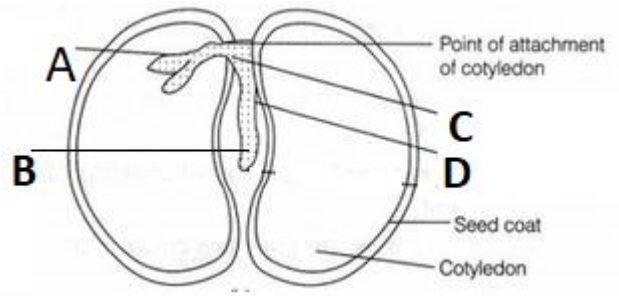
(b) Name any two elements that are used in fabricating solar cell panels? 1

(c) What do you mean by the term 'thermal' power plant? 1

(d) Why is it not possible to use solar cells to meet all our needs? 1

State any one reason. 1

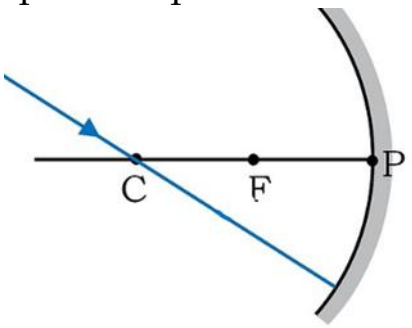
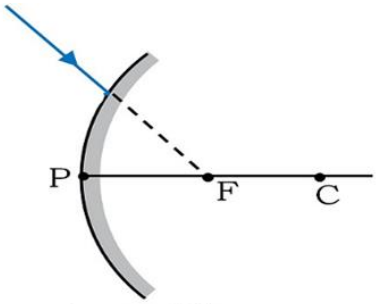
4.	**Study the diagram carefully and answer the following questions from 4(a) - 4(d).** The diagram shows a section of a shoot growing in one-sided light.  (a)Name the chemical produced by the cells at the tip. (b)Compare the distribution of the chemical in the light and shaded side of the shoot below the tip. (c)How has the chemical affected the cells in the shaded side of the shoot? (d)Explain the advantage to the plant of bending towards light.	1 1 1 1
5.	The change of focal length of an eye lens is by the action of (i) Pupil (ii) Cornea (iii) Iris (iv) Ciliary muscles **OR** The defect of vision in which the person is able to see distant objects distinctly but cannot see nearby objects clearly is called (i) Hypermetropia (ii) Myopia (iii) Presbyopia (iv) Cataract	1

6.	A current of 2A flows through a conductor whose ends are at a potential difference of 4V. The resistance of the conductor is: (i) 8Ω (ii) 0.5Ω (iii) 6 Ω (iv) 2 Ω	1
7.	The SI unit of electric current can also be expressed as: (i) coulomb-second (ii) coulomb/second (iii) watt-second (iv) joule/ second	1
8.	 The given figure shows the last two stages of yeast budding. Identify the correct labellings. (i)A=Parent yeast, B=Bud scar, C=Birth scar, D=Daughter yeast (ii) A=Daughter yeast, B=Birth scar, C=Bud scar, D=Parent yeast (iii)A=Parent yeast, B=Birth scar, C=Bud scar, D=Daughter yeast (iv)A=Daughter yeast, B=Bud scar, C=Birth scar, D=Parent yeast **OR** 	1

	In the given figure of an embryo inside a dicot seed, identify the correct labellings. (i)A=Plumule, B=Radicle, C=Hypocotyl, D=Epicotyl (ii) A=Plumule, B=Radicle, C=Epicotyl, D=Hypocotyl (iii) A=Radicle, B=Plumule, C=Hypocotyl, D=Epicotyl (iv)A= Radicle, B=Plumule, C=Epicotyl, D=Hypocotyl	
9.	Father's blood group is 'A'. Mother's blood group is 'B'. Their son has blood group 'O'. What should be the genotypes of the parents?	1
10.	Which of the following statements are usually correct for carbon compounds? (i) These are good conductors of electricity. (ii) These are poor conductors of electricity. (iii) These are generally soluble in polar solvents, like water. (iv) These do not have strong forces of attraction between their molecules.	1
11.	Four drops of red litmus solution were added to each of the following samples. Which one will turn red litmus blue? (i) Alcohol (ii) Distilled water (iii) Sodium hydroxide solution (iv) HCℓ	1
12.	The elements A, B, C, D and E have atomic number 9, 11, 17, 12 and 13 respectively. Which pair of elements belong to the same group? (i)A and B (ii)B and D (iii)A and C (iv) D and E	1

	OR Which one of the following does not increase while moving down the group of the periodic table? (i)Atomic radius (ii)Metallic character (iii)Valence electron (iv)Number of shells in an element	
	For question numbers 13 and 14, two statements are given- one labeled Assertion (A) and the other labeled Reason (R). **Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below:** (i) Both A and R are true and R is correct explanation of the assertion. (ii) Both A and R are true but R is not the correct explanation of the assertion. (iii) A is true but R is false. (iv) A is false but R is true.	
13.	**Assertion :** When a strip of copper is dipped in a solution of silver nitrate, silver metal is precipitated and a solution of copper nitrate is produced. **Reason :** Copper is more reactive metal than silver, therefore it can displace silver from its salt solution.	1
14.	**Assertion:** A fuse in a circuit prevents damage to the appliances and the circuit due to overloading. **Reason:** Fuse consists of tin-plated copper wire having low melting point, which melts and breaks the circuit if the current exceeds the safe value.	1
	Section B	

15.	(i) Why is magnesium ribbon cleaned before burning it in air? (ii) How can you explain that respiration is an exothermic reaction? (iii) State any two ways to prevent the rancidity of food containing oils and fats.	3
16.	State observations of the reactions of dil. HCℓ with the following: (i) Blue litmus paper and Red litmus paper (ii) Zinc-granules (iii) Solid $NaHCO_3$ **OR** (i) What is plaster of paris? Write its chemical formula. (ii) How is plaster of paris prepared? Write the chemical equation of the reaction involved. (iii) Explain why plaster of paris should be stored in a moisture proof container.	3
17.	An ore, on treatment with dilute hydrochloric acid, gives brisk effervescence to produce a colourless and odourless gas. Identify the type of ore. State in brief the metallurgical processes that are applied on this type of ore to extract the metal.	3
18.	(i)Name the organs that release the following digestive juices. (a)Gastric juice (b)Bile juice Also mention the role of these juices in digestion. (ii)Mention the factors that determine selective reabsorption of water in nephrons. **OR** (i)Respiratory organs of all organisms have several structural similarities. Enlist **four** features that are common in them. (ii)What is the difference in the blood circulation mechanism of fish and birds?	3

19.	(i)Economic growth and ecological conservation should go hand-in-hand. Justify stating **two** reasons. (ii)State any **two** reasons why there is a need to manage our resources? (iii) Kulhs and khadins are traditional methods of water harvesting used in hilly regions, and plains or plateaus respectively. State **one** important difference between kulhs and khadins?	3
20.	Why is energy flow in the biosphere unidirectional?	3
21.	(i)In human nervous system, what is CNS and PNS? What is the functional difference between the two? (ii)How is CNS protected?	3
22.	A student has a concave mirror of focal length 20 cm and he wants to see an erect image of his face in the mirror. (i)What should be the range of the distance of the mirror from his face? (ii) State the nature and size of the image he is likely to observe. (iii) Draw the ray diagrams shown below in your answer sheet and complete the path of the reflected ray in both the cases.  Concave Mirror  Convex Mirror	3
23.	(i) With the help of a neat diagram describe an activity to show the pattern of magnetic field lines around a straight current carrying conductor.	3

	(ii) What is an electric generator? What is its working principle?	
24.	What is dispersion of light? Draw a diagram to show the dispersion of light by a glass prism. A glass prism is able to produce a spectrum, where as a glass slab does not. Explain why is it so? **OR** "Rainbow is an example for dispersion of sunlight". Justify this statement by explaining with the help of a labelled diagram, the formation of a rainbow in the sky. List two essential conditions for observing a rainbow.	3
	Section C	
25.	(i) State Mendeleev's periodic law. (ii) State two demerits of Mendeleev's periodic table. (iii) An element X (atomic number 17) reacts with an element Y (atomic number 20) to form a divalent halide. (a) Predict the position of X and Y in the periodic table. (b) Classify X and Y as metal, non-metal or metalloid. (c) What will be the nature of oxide of elements X and Y? **OR** (i) What is Newland's Law of octaves? (ii) State two merits of Modern periodic table. (iii) An element X belongs to group 14 and 3rd period of the modern periodic table. (a)Write the electronic configuration of X and determine its valency. (b)Name the element. (c)Is it a metal, a non-metal or a metalloid ?	5
26.	(i) "Alkenes form a homologous series". Explain. (ii) How is ethene prepared from ethanol? Give the chemical equation.	5

	(iii) Name the organic acid present in vinegar. Write its chemical formula also. (iv) What is saponification? Write the reaction involved in this process. (v) Why detergents are better cleansing agents than soaps? Explain.	
27.	(i)In sexually-reproducing organisms there are two types of gametes – male and female. In very simple organisms the male and female germ cells are not very different from each other. However, in complex organisms the gametes are very different from each other. State **two** common differences found in the male and female gametes of any complex organism. (ii)Draw a neat diagram of the human female reproductive system. Identify, label and name the following. (a)The site of fertilization. (b)The place where implantation of the zygote occurs. (c)The passage between uterus and vagina. (ii)After reaching puberty, every month the uterus of every human female makes certain preparations. (a)What are the preparations done by the uterus? (b)Why such preparations are done by the uterus every month?	5
28.	(i)A change in DNA that is useful for one property to start with, can become useful later for a different function. Explain. (ii)How can geographical isolation lead to reproductive isolation? **OR** (i)A cross is made between two pure bred pea plants, one with round, green seeds and the other with wrinkled, yellow seeds. (a)What will be the phenotypes of first generation plants?	5

<table>
<tr><td></td><td>(b)On selfing the first generation plants, 4 types of phenotypes appear in the second generation plants. Mention the new combinations that appear in the phenotypes of F2 generation plants.
(c)What is the phenotypic ratio of such a cross? Which Mendelian law explains this ratio?
(ii)Genes control traits. Explain this taking the example of plant height.</td><td></td></tr>
<tr><td>29.</td><td>(i) Define 1 volt.
(ii) Calculate the amount of energy consumed in carrying a charge of 1C through a battery of 3V.
(iii) Two resistors with resistances 5Ω and 10Ω are to be connected to a battery of 6V so as to obtain
(a) minimum current (b) maximum current.
How will you connect the resistors in each case?
(iv) Calculate the total current in the circuit in the 2 cases?</td><td>5</td></tr>
<tr><td>30.</td><td>(i) State Snell's law of refraction of light.
(ii) The following table gives absolute refractive indices of few media.
<table>
<tr><td>Medium</td><td>Water</td><td>Crown glass</td><td>Rock salt</td><td>Ruby</td><td>Diamond</td></tr>
<tr><td>Refractive index</td><td>1.33</td><td>1.52</td><td>1.54</td><td>1.71</td><td>2.42</td></tr>
</table>
In which of these media is the speed of light
(a) maximum and (b)minimum? Give reason for your answer.
(iii) Find the refractive index of crown glass with respect to water.</td><td>5</td></tr>
</table>

	(iv) Calculate the speed of light in diamond, if the speed of light in vacuum is 3x108 m/s. **OR** (i) The magnification of an image formed by a lens is -1. If the distance of the image from the optic centre of the lens is 25 cm, (a) where is the object placed? (b) find the nature and focal length of the lens. **(**ii) If the object is placed at 15 cm from the optic centre of the lens, where would the image be formed? Draw a diagram to justify your answer.	