

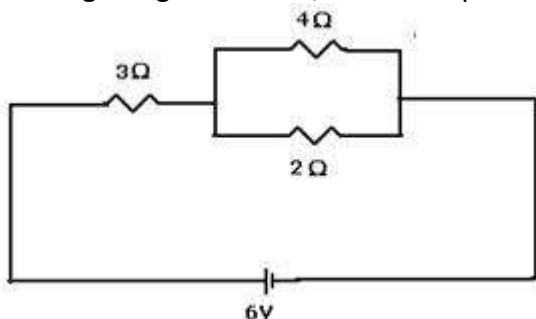
CLASS X SAMPLE PAPER SCIENCE

ELECTRICITY

1. What is electric current?
2. What is the SI unit of electric current?
3. What is the SI unit of electric charge?
4. What is ohm's law? Give its mathematical expression?
5. How much current will an electric heater coil draw from a 220 volt line, if the resistance of the heater coil is $40\ \Omega$?
6. Calculate the number of electrons constituting one coulomb of charge.
7. The potential difference between the terminals of an electric heater is 30 volt when it draws current of 4 A from the source. What current will the heater draw if the potential difference is increased to 120 volt?
8. A current of 4 A exists in a $10\ \Omega$ resistor for 4 minute. Find the charge and the number of electrons that pass through any cross-section of the resistor in this time
9. Why are metals able to conduct electricity
10. How should the resistances be connected so that the equivalent resistance is increased?
11. The combination of resistances shown below has equivalent resistance equal to 12 ohm, what is the value of R?



12. Which metal is the best conductor of electricity at room temperature?
13. Calculate the amount of charge that would flow in 1 hour through the elements of an electric bulb drawing a current of 0.4 A.
14. What is the power of an electric lamp, if it draws 20 A current when connected to 220 V line?
15. To produce 1000 joule of heat in 10 seconds, how much voltage should be applied to $50\ \Omega$ resistance.
16. In the circuit diagram given below, find the equivalent resistances and total current flowing through the



circuit.

17. a) State the law, which relates the current in a conductor to the potential difference across its ends.
 - i. Draw the V-I graphs for a

- ii. A simple electric circuit has 24 V batteries and a resistor of 30 ohm. What will be the current in the circuit?
18. What is a magnet?
 19. What is the SI unit of induced current?
 20. What is the frequency of d.c current?
 21. What is the principle on which working of electric generator is based? What are their important parts?
 22. Why two magnetic lines of forces don't intersect each other?
 23. Give two methods with which we can increase the strength of magnetic field produced by a circular coil carrying current?
 24. State the following laws:
 - a. Maxwell's right hand rule.
 - b. Fleming's left hand rule
 - c. Fleming's right hand rule.
 25. What do you mean by electromagnetic Induction? Explain the induction of current in the secondary coil with change in current in primary coil.
 26. Distinguish between an electric motor and generator?
 27. What are the factors which govern the force experienced by a current carrying conductor placed in a uniform magnetic field depends?
 28. What is the frequency of a.c current that you use in your house?
 29. What is magnetic field?
 30. There is a battery operated toy, what kind of motor is being used in it?
 31. Give two example of devices in which d.c motor is used.
 32. Give two examples in which a.c motor is used.
 33. What will be the frequency of an alternating current, if its direction changes after every 0.05 sec?
 34. What is direct current (d.c) and alternating current (a.c).
 35. What is the principle behind the working of electric generator? Explain its working with the help of well labeled diagram.

LIGHT REFLECTION AND REFRACTION HUMAN EYE AND THE COLOURFUL WORLD

36. An object is placed at a distance of 10cm from a convex mirror of focal length 15 cm. find the position and nature of the image.
37. What do you understand by the principal focus of a concave mirror?
38. Why do we prefer a convex mirror as a rear-view mirror in vehicles
39. The refractive index of diamond is 2.42. What is the meaning of this statement?
40. What is the difference between real and virtual images?
41. What are the uses of a concave mirror?
42. What is the property of image formed by a concave lens?
43. Name the three primary colours?
44. For which colour the refractive index of material is maximum?
45. Find the focal length of a convex mirror where radius of curvature is 32 cm.
46. Find the power of a concave lens of focal length 2m.
47. What is refraction of light? Write a law of refraction.

48. A doctor has prescribed a corrective lens of power + 1.5 D. Find the focal length of the lens. Is the prescribed lens diverging or converging?
49. An object 5 cm in length is held 25 cm away from a converging lens of focal length 10cm. Draw the ray diagram and find the position, size and nature of the image formed.
50. Define reflection of light.
51. What happens to the light when it travels from denser to rarer medium?
52. Where will the image be formed when an object is placed between the pole and focus point of the mirror?
53. What colour we obtain when we mix red and green?
54. What is short sightedness or myopia? What causes myopia? How is myopia corrected?
55. Why does it take some time to see objects in a dim room when you enter the room from bright sunlight outside?
56. What is Presbyopia? How is it corrected?
57. Define dispersion and spectrum?
58. What happens to the image distance in the eye when we increase the distance of an object from the eye?
59. Why does the sky appear dark instead of blue to an astronaut?
60. In an eye, where is image formed?
61. What is iris?
62. Cinematography is based on which principle?
63. The far point of a myopic person is 80cm in front of the eye. What is the nature and power of the lens required to correct the problem?
64. What do you understand by power of accommodation of the eye?
65. Define least distance of distinct vision.
66. Why do stars twinkle?
67. How will you say that white light of the sun is made of seven colours?
68. Where is far point located for a normal eye?
69. Cylindrical lenses are used to correct which type of defects of vision?
70. Hypermetropia is corrected by which type of lens?
71. What is the cause of cataract?

SOURCES OF ENERGY

72. Can you place alcohol under the category of renewable source of energy?
73. What is non-renewable source of energy?
74. Which type of energy we use to perform our day to day work?
75. What is geothermal energy? When is it available?
76. Give two merits of solar energy.
77. What are the limitations of wind energy?
78. How are the blades of a windmill designed for harnessing wind energy?
79. What are the advantages of nuclear energy?
80. Distinguish between renewable and non-renewable sources of energy. Give examples too.
81. What is solar cooker? Explain its working with the help of a neat & labeled diagram.
82. Which component of sunlight is responsible for carrying heat?
83. Which material is used for making solar cell?

84. Name a renewable source of energy that we can harness for the whole year non-stop?
85. Why the use of dry wood is not considered as good domestic fuel?
86. What are the forms of ocean energy that can be harnessed? Give some places in our country where it can be harnessed?
87. State three advantages of solar cooker?
88. What do you mean by OTEC? What are the conditions necessary for the working of an OTEC?
89. What do you mean by Biomass? What is Biogas? Draw a diagram of biogas plant and explain its working.
90. What are the various forms in which energy from water can be used?

OUR ENVIRONMENT/MANAGEMENT OF NATURAL RESOURCES

91. What is pollution?
92. What is afforestation?
93. Name two sources which are threats to our marine water?
94. Name the two sources of water pollution?
95. Give two advantages of using wind energy?
96. What is soil erosion and its causes?
97. What are the sources of water pollution?
98. What do you mean by term N.G.O?
99. Describe the factors responsible for pollution of river Ganga?
100. Name the chemical which is responsible for depletion of ozone layer?
101. What do you mean by the term biota?
102. What is water harvesting?
103. What is agriculture?
104. What do you mean by the term effluents?
105. What are the ill effects of ozone layer depletion?
106. What are pesticides and herbicides?
107. Distinguish between national parks and national sanctuaries.
108. What are the steps one may take to check soil erosion?
109. How can we control water pollution?
110. How is ozone gas useful for our ecosystem?
111. What is water table? State some characteristics of drinking water.
112. Name the disease caused by the prolonged inhalation of cotton fiber dust.
113. What do you mean by eutrophication?
114. What is food chain? What forms the basis of every food chain?
115. Name a pollutant which enters our body via food chain.
116. Which chemical compound is responsible for the depletion of ozone layer?
117. What is acid rain? How has acid rain affected our ecosystem?
118. Discuss briefly the main causes of soil erosion.
119. Give an example of greenhouse gas.
120. What is smog?
121. Give the full form of the following

- i. IUCN
- ii. DDT

122. The flow of energy in the food chain is unidirectional. Comment.

123. Name a pollutant which enters our body via food chain.

124. What do you mean by biological magnification? List the substances that cause Biological Magnification.

LIFE PROCESSES

125. How does the process of nutrition take place in amoeba? Explain with the help of labeled figures.

126. What is peristaltic movement? How helpful are they in human digestion?

127. How do the alveoli of lungs in human body help in the exchange of gases?

128. Write the methods used by the plants to get rid of excretory products.

129. Sketch a flow diagram for the various pathways for breakdown of glucose.

130. How are carbohydrates, proteins & fats digested in small intestine?

131. What do you mean by holozoic nutrition?

132. Give the full forms of ATP and ADP.

133. Describe the structure and functioning of nephron in the human body.

134. Why do herbivores need a longer intestine and the carnivores the shorter one?

135. What are the differences between arteries and veins?

136. Describe what happens to the eaten food in stomach?

137. How does the transportation of food take place in plants?

138. How is lymph formed? Write its functions.

139. What is bile?

140. Why is the rate of respiration faster in aquatic organisms as compared to terrestrial organisms?

141. Draw a well labeled sectional view of human heart showing the passage of flow of blood.

142. Write the basic differences between autotrophic and heterotrophic nutrition.

143. Name and write the function of the enzyme present in human saliva.

144. Why is the process of simple diffusion sufficient for taking in food, exchange of gases and removal of waste in unicellular organism but not sufficient in multicellular organism?

145. What are the events taking place in the process of photosynthesis?

146. Define emulsification

147. Write the values of normal systolic and diastolic pressures in the human body.

148. What are the names of future shoot and future root in a germinating seed?

CONTROL AND COORDINATION

149. What are the two ways of control and coordination in animals?

150. What are two different types of plant movements?

151. What is insulin? Where is it produced?

152. How are the animal movements different from that of plant movements?

153. What is reflex arc? Where is it formed?

154. What is the general scheme of nerve impulses traveling in our body?

155. Name the chemical substances which control and coordinate in plants.
156. Which part of the brain does give rise to spinal cord?
157. Draw the well-labelled figures of human brain.
158. Name the hormones secreted at puberty in males and females?
159. Does thinking also involve the creation of nerve impulses?
160. How do animal muscles move in order to perform an action or movement?
161. How are the information and decision processed in the forebrain?
162. What are plant hormones? What is the relationship between their site of production and site of action?
163. Name the longest cell in our body.
164. What is cranium?
165. Why are endocrine glands also known as ductless glands?

REPRODUCTION

166. Why is DNA copying an essential part of the process of reproduction?
167. Why is variation beneficial to the species but not necessarily for the individual?
168. What are the changes seen in the girls at the time of puberty?
169. How does the embryo get nourishment inside the mother's body?
170. Write any one method to avoid pregnancy in human beings.
171. Where does fertilization take place in human female?
172. What are advantages of sexual reproduction over asexual reproduction?
173. How does the vegetative reproduction take place in Bryophyllum?
174. Draw and label the diagram of human female reproductive system.
175. Why is vegetative propagation practiced for growing some types of plants?
176. If a woman is using copper-T will it help in protecting her from sexually transmitted disease?
177. Name the parts of female reproductive system in human beings.
178. How many individuals are involved in sexual reproduction?
179. Name any one organism showing process of regeneration.
180. What are the functions performed by the testis in human beings?
181. What is menstruation?
182. Name the different methods of contraception?
183. What could be the reasons for adopting contraceptive methods?
184. How does reproduction help in providing stability to populations of species?
185. Draw and label longitudinal section of a flower.
186. What type of reproduction involves gametes?
187. How does binary fission differ from multiple fission?
188. How is the process of pollination different from fertilization?
189. What is the role of the seminal vesicles and the prostate gland?
190. How does the asexual mode of reproduction take place in yeast?
191. Write full form of DNA How does the mode of reproduction different in unicellular and multicellular organisms?
192. Show by figures only the asexual mode of reproduction by budding in case of Hydra.
193. Draw and label the figure showing germination of pollen on stigma.

HEREDITY AND VARIATION

194. What is the basic structural unit of a DNA? What are its components?
195. Define (i) Variation (ii) Fossils (iii) Gene.
196. What is Mendel's factor better known as?
197. What do you mean by autosomes?
198. What is Darwin's theory of evolution?
199. Who is known as "father of genetics"?
200. Differentiate between homologous and analogous organs.
201. Give two functions of chromosomes.
202. What is heredity?
203. What is Mendel's contribution to heredity and evolution?
204. Explain the Law of Purity of Gametes.
205. Explain the inheritance of Dominant characters with the help of cross between a tall pea plant and a short pea plant.
206. Explain the law of Independent assortment with the help of Dihybrid cross.
207. "Sex of a child is a matter of chance" explain with the help of cross between the human male and female sex chromosomes.
208. What evidence does fossil provide about our evolution?
209. What are vestigial organs? Give examples
210. Are forelimbs of man and frog analogous organs? Why or why not?
211. What do you mean by organic evolution?
212. What are the features that Archaeopteryx has in common to the reptiles?

CHEMICAL REACTIONS

213. What happens when an iron nail is dipped in copper sulphate solution?
214. Explain the oxidation in terms of gain or loss of oxygen with examples.
215. Explain the terms oxidizing and reducing agents.
216. Oil and fat containing food items are flushed with Nitrogen. Why?
217. Why do we apply paint on iron articles?
218. What do you understand by corrosion?
219. Define oxidizing agent.
220. Identify the component oxidized in the following reaction : $\text{H}_2\text{S} + \text{Cl}_2 \rightarrow \text{S} + 2\text{HCl}$
221. Which of the following is a combination and which is a displacement reaction?
 - (a) $\text{Cl}_2 + 2\text{KI} \rightarrow 2\text{KCl} + \text{I}_2$
 - (b) $2\text{K} + \text{Cl}_2 \rightarrow 2\text{KCl}$
222. A solution of a substance 'X' is used for white washing. (a) Name the substance 'X' and write its formula.(b) Write the reaction of the substance 'X' named in (a) above with water.
223. What is the difference between displacement and double displacement reactions? Write example of each reaction.
224. Why should magnesium ribbon be cleaned before burning in air?
225. Explain the oxidation in terms of gain or loss of oxygen with examples.
226. What do you understand by corrosion?

227. What is a chemical reaction?
228. Define rancidity.
229. What is meant by oxidation?
230. What are displacement reactions?
231. What is catalytic decomposition?
232. What do you understand by a balanced chemical equation? Why should the chemical equation be Balanced?
- Sodium + Water \longrightarrow Sodium hydroxide + Hydrogen
 - Barium Chloride + Aluminium Sulphate \longrightarrow Barium Sulphate + Aluminium Chloride
- (c) Hydrogen sulphide + Oxygen \longrightarrow Water + Sulphur dioxide
233. Why respiration is considered an exothermic reaction? Explain.
234. What is the difference between combination and decomposition reaction? Give one example of each type.
235. What type of reaction is represented by the digestion of food in our body?
236. Why does the colour of copper sulphate solution change when an iron nail is dipped in it?
237. What are double displacement reactions? Give an example.

ACID BASES AND SALTS

238. A metal compound 'X' reacts with dilute hydrochloric acid to produce gas (Y). The gas (Y) evolved extinguishes a burning candle. Write a balanced chemical equation for the reaction if one of the compounds formed is calcium chloride. Write names of x & y.
239. Why does distilled water not conduct electricity, whereas rainwater does?
240. Fresh milk has a pH 6. How do you think the pH will change as it becomes sour?
241. Name the acid found in (a) Soft drinks (b) Vinegar.
242. How does an acid taste?
243. Which gas is usually liberated when an acid reacts with a metal? Illustrate with an example. How will you test for the presence of this gas?
244. What are acid & base indicators?
245. What are alkalis?
246. Why does an aqueous solution of acid conduct electricity?
247. Write an equation to show the reaction between Plaster of Paris and water.
248. Name the sodium compound which is used for softening hard water.
249. Name three mineral acids.
250. How is concentration of hydroxide ions (OH^-) affected when excess of base is dissolved in a solution of sodium hydroxide?
251. What is bleaching powder? How is it prepared? Write chemical equation involved in the preparation of bleaching powder. Write two uses of bleaching powder.
252. What is the chemical name of washing soda?
253. What is a base?
254. What is an alkali?
255. Define pH.
256. What is an indicator?

METALS AND NON-METALS

257. Why the reaction of metals with water, hydrogen and acid cannot be used to compare the reactivity of metals?
258. Write the electron - dot structure for sodium and magnesium.
259. Why do electrovalent compounds have high melting and boiling points?
260. What are minerals?
261. What do you understand by ores?
262. Define activity series of metals.
263. Which type of metals is found in Free State in the earth's crust?
264. Write two advantages and one limitation of using carbon as reducing agent in the metallurgy.
265. What is the difference between Calcination and roasting?
266. What happens when zinc is added to a solution of iron (II) sulphate? Write the chemical reaction.
267. Write equation for the reaction of
- Calcium with water
 - Potassium with water
 - Zinc with dilute hydrochloric acid
268. What is gangue?
269. What do you understand by metallurgy?
270. Name two metals which will displace hydrogen from dilute acid and two metals which will not.
271. What is an alloy?
272. What chemical process is used for obtaining a metal from its oxide?
273. Define corrosion of metals? What is rust? How can be rusting prevented?
274. What is chemical name and formula of limestone? What happens when limestone is strongly heated? Write the chemical equation involved. How can the presence of excess of CO₂ be tested in a class room from the products formed?
275. Give an example of a metal which -
- is the best conductor of heat
 - is a poor conductor of heat
276. Give two examples of metals which can be easily cut with a knife .
277. Which gas is evolved when magnesium reacts with very dilute nitric acid? Write the equation involved.
278. Explain why is sodium Kept immersed in kerosene oil?
279. What do you understand by Aquaregia?
280. In the electrolytic refining of a metal M, what would you take as the anode and the cathode?
281. Represent the formation of MgO and Na₂O by the transfer of electrons. Name the ions present in these compounds.
282. Differentiate between metal and non – metals on the basis of their chemical properties.
283. Explain why zinc metal can displace copper from copper sulphate solution but copper cannot displace zinc from zinc sulphate solution.
284. Why are stainless steel cooking pans often given a copper outer bottom?
285. Give two uses of Aluminium.

286. State the major steps usually involved in the metallurgical processes. Name the chief ore of aluminium. Describe with a labelled diagram and with the necessary chemical equations, how aluminium is extracted from this ore.
287. What do you understand by metals?
288. Write a metal and a non metal which is liquid at room temperature.
289. Define malleability.
290. What are non-metals?
291. Name a metal that is not corroded in air.
292. What type of oxides is formed when non-metals combine with oxygen?

CARBON AND ITS COMPOUNDS

293. What is meant by a functional group in an organic compound?
294. Which of the following would yield an unsaturated hydrocarbon on cracking : C_6H_{14} , C_2H_6 , C_2H_4 ?
295. Name the products formed when methane burns in :
- Sufficient supply of air.
 - Insufficient supply of air.
- Write the chemical equations for above reactions.
296. How is an ester prepared in the lab? Write its one use in daily life.
297. With the help of a labelled diagram explain how methane is prepared in the laboratory. Explain with the help of chemical equation. Why it is dangerous to burn methane in insufficient supply of air?
298. What is the optimum temperature for fermentation?
299. Why are carbon and its compounds used as fuels for most application?
300. What is hydrogenation?
301. What are synthetic detergents? Give one example of synthetic detergent. Write its two advantages over soap.
302. Compound 'A' is obtained from wood-tar distillation. It has specific smell and burning taste. It burns with blue flame to give CO_2 and H_2O . It is soluble in water. It is used as a fuel and solvent. It reacts with sodium metal and gives out hydrogen gas. It reacts with acetic acid to form pleasant fruity smelling compound 'B' in presence of concentrated H_2SO_4 . Identify 'A' and 'B' and give equations for all the reactions involved.
303. What is fermentation? How is ethanol prepared by fermentation? Give two uses of ethyl alcohol. What are the harmful effects of drinking alcohol?
304. What are the saturated hydrocarbons?
305. What is fermentation?
306. Name the type of compounds which give fruity smell.
307. What change will you observe if you test soap with a litmus paper (red and blue)?
308. Name one alcohol which is poisonous.
309. What substances are added to ethanol to make it unfit for drinking purposes?
310. Which of the following hydrocarbon undergo addition reactions: C_2H_6 , C_3H_8 , C_3H_6 , C_2H_2 , and CH_4 ?

PERIODIC CLASSIFICATION OF ELEMENTS

311. Why do you think the noble gases are placed in a separate group?
312. How many elements were known when Mendeleev classified the elements?

313. Why are the elements in the same group of the periodic table show close resemblance in chemical behavior?

314. Why are anions bigger than their parent atoms?

315. How does the electronic configuration of an atom relate to its position in the Modern Periodic Table?

316. Write the demerits of Newlands' law of octaves.

317. Write the merits of Mendeleev's classification of elements.

318. In the following diagram for the first three periods of the periodic table, five elements have been represented by the letters a, b, c, d and e (which are not their chemical symbols):

1		2	13	14	15	16	17	18
			a				b	
	c					d		e

(i) Select the letter which represents a halogen.

(ii) Select the letter which represents a noble gas.

(iii) What type of bond is formed between a and b?

(iv) What type of bond is formed between c and d?

(v) Which element will form a divalent anion?

319. What are the limitations of Dobereiner's triad?

320. What was the criterion used by Mendeleev in creating his periodic table?

321. State the modern periodic law.

322. Nitrogen (atomic number 7) and phosphorus (atomic number 15) belong to group 15 of the periodic table.

Write the electronic configuration of these two elements. Which of these will be more electronegative?

Why?

323. Element X forms a chloride XCl_2 , which is a solid with a high melting point. X would most likely be in the same group of the periodic table as:

(a) Na (b) Mg (c) Al (d) Si

324. For each the following triads, name the element with the characteristics specified below:

Elements	Least atomic radius	Chemically least reactive
F, Cl, Br
Li, Na, K