CBSE Class 10 Science Question Paper 2020

General Instructions :

Read the following instructions very carefully and strictly follow them :

(i) *This question paper comprises* ***three*** *Sections – A, B and C. There are* ***30*** *questions in the question paper.* ***All*** *questions are compulsory.*

(ii) ***Section A*** *– Questions no.* ***1*** *to* ***14*** *— all questions or part thereof are of* ***one*** *mark each. These questions comprise Multiple Choice Questions (MCQ), Very Short Answer (VSA) and Assertion–Reason type questions. Answer to these questions should be given in* ***one word*** *or* ***one sentence.***

(iii) ***Section B*** *– Questions no.* ***15*** *to* ***24*** *are short answer type questions, carrying* ***3*** *marks each. Answer to these questions should not exceed 50 to 60 words.*

(iv) ***Section C*** *– Questions no.* ***25*** *to* ***30*** *are long answer type questions, carrying* ***5*** *marks each. Answer to these questions should not exceed 80 to 90 words.*

(v) *Answers should be brief and to the point. Also the above mentioned word limit be adhered to as far as possible.*

(vi) *There is no overall choice in the question paper. However, an internal choice has been provided in some questions in each Section.* ***Only one of the choices*** *in such questions have to be attempted.*

(vii) *In addition to this, separate instructions are given with each section and question, wherever necessary.*

SECTION A

1. State the common characteristic of the following elements : 1

Boron, Silicon, Germanium and Arsenic

OR

State the Periodic Law on which the Modern Periodic Table is based. 1

2. Covalent compounds are generally poor conductors of electricity. Why ? 1

3. Question numbers 3(a) – 3(d) are based on the table and related information in the passage given below.

Thyroid Stimulating Hormone (TSH) stimulates thyroid gland to produce thyroxine. Study the table given below.

Table : TSH levels during pregnancy

Stage of pregnancy	Normal (mU/L)	Low (mU/L)	High (mU/L)
First trimester	0·2 – 2·5	< 0·2	2·5 – 10
Second trimester	0·3 – 3·0	< 0·3	3·01 – 4·5
Third trimester	0·8 – 5·2	< 0·8	> 5·3

It is important to monitor TSH levels during pregnancy. High TSH levels and hypothyroidism can especially affect chances of miscarriage. Therefore, proper medication in consultation with a doctor is required to regulate/control the proper functioning of the thyroid gland.

3(a) Give the full form of TSH. 1

3(b) State the main function of TSH. 1

3(c) Why do TSH levels in pregnant women need to be monitored ? 1

3(d) A pregnant woman has TSH level of 8·95 mU/L. What care is needed for her ? 1

4. Answer question numbers 4(a) – 4(d) on the basis of your understanding of the following paragraph and the related studied concepts :

Solar power in India is a fast developing industry. The country's solar installed capacity reached 30·071 GW as of 31 July, 2019. India has the lowest capital cost per MW to install solar power plants. Solar electricity generation recorded nearly 3·4% of total utility electricity generation in January 2019. The following table shows Annual Solar Power Generation of the last six years.

Year	Solar Power Generation (TWh)
2013 – 14	3·35
2014 – 15	4·60
2015 – 16	7·45
2016 – 17	12·09
2017 – 18	25·87
2018 – 19	39·27

Our country is lucky to receive solar energy for the greater part of the year. It is estimated that during a year India receives the energy equivalent to more than 5000 trillion kWh from the Sun.

4(a) What are solar cells ? 1

4(b) How much voltage can be developed and how much electricity can be produced by one typical solar cell when exposed to the Sun ? 1

4(c) The future of power generation by solar energy is bright in India. Give reason. 1

4(d) List two advantages of solar cells. 1

5. A cylindrical conductor of length '*l*' and uniform area of cross-section 'A' has resistance 'R'. Another conductor of length 2·5 *l* and resistance 0·5 R of the same material has area of cross-section 1

(A) 5 A

(B) 2·5 A

(C) 0·5 A

(D) $\frac{1}{5}$ A

6. The image distance from the eye lens in the normal eye when we increase the distance of an object from the eye 1

(A) increases.

(B) decreases.

(C) remains unchanged.

(D) depends on the size of the eyeball.

7. The values of mA and μA are 1

(A) 10^{-6} A and 10^{-9} A respectively

(B) 10^{-3} A and 10^{-6} A respectively

(C) 10^{-3} A and 10^{-9} A respectively

(D) 10^{-6} A and 10^{-3} A respectively

. The Reni village of Garhwal is famous for 1

(A) Monocultures of pine, teak and eucalyptus.

(B) Chipko Movement.

(C) Extensive biodiversity.

(D) Participation of local people in efficient management of forests.

9. Consider the following criticisms that are generally addressed when a new project is launched :

I. Displacement of peasants and local tribals without compensation.

II. Swallowing up large amount of public money without any benefits.

III. Deforestation and loss of biodiversity.

The criticisms about large dams in particular are 1

(A) I and II

(B) II and III

(C) I and III

(D) I, II and III

OR

Switching off unnecessary lights and fans and repairing leaking taps correctly defines which term of 5R's ? 1

(A) Recycle

(B) Reuse

(C) Repurpose

(D) Reduce

10. An element X with atomic number 12 forms a compound with element Y with atomic number 17. The formula of the compound formed is 1

(A) XY

(B) XY_2

(C) X_2Y

(D) X_2Y_3

OR

An element X is forming acidic oxide. Its most probable position in the modern periodic table is 1

(A) Group 1 and Period 3

(B) Group 16 and Period 3

(C) Group 17 and Period 3

(D) Group 2 and Period 3

P.T.O.

11. Strong heating of ferrous sulphate leads to the formation of a brown solid and two gases. This reaction can be categorised as

(A) displacement and redox.

(B) decomposition and redox.

(C) displacement and endothermic.

(D) decomposition and exothermic. 1

12. If 10 mL of H_2SO_4 is mixed with 10 mL of $Mg(OH)_2$ of the same concentration, the resultant solution will give the following colour with universal indicator :

(A) Red

(B) Yellow

(C) Green

(D) Blue 1

For question numbers 13 and 14, two statements are given – one labelled Assertion (A) and the other labelled 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 (A).

(ii) Both (A) and (R) are true, but (R) is ***not*** the correct explanation of the assertion (A).

(iii) (A) is true, but (R) is false.

(iv) (A) is false, but (R) is true.

13. *Assertion (A) :* At high temperatures, metal wires have a greater chance of short circuiting.

Reason (R) : Both resistance and resistivity of a material vary with temperature. 1

Assertion (A) : Carbon has a strong tendency to either lose or gain electrons to attain noble gas configuration.

Reason (R) : Carbon has four electrons in its outermost shell and has the tendency to share electrons with carbon or other elements. 1

SECTION B

15. In the electrolysis of water

(a) Name the gases liberated at anode and cathode.

(b) Why is it that the volume of gas collected on one electrode is two times that on the other electrode ?

(c) What would happen if dil. H_2SO_4 is not added to water ?

OR 3

A chemical compound 'X' is used in the soap and glass industry. It is prepared from brine.

(a) Write the chemical name, common name and chemical formula of 'X'.

(b) Write the equation involved in its preparation.

(c) What happens when it is treated with water containing Ca or Mg salts ? 3

16. A shining metal 'M', on burning gives a dazzling white flame and changes to a white powder 'N'.

(a) Identify 'M' and 'N'.

(b) Represent the above reaction in the form of a balanced chemical equation.

(c) Does 'M' undergo oxidation or reduction in this reaction ? Justify. 3

17. (a) List any two distinguishing features between Mendeleev's Periodic Table and the Modern Periodic Table.

(b) With the help of an example, explain Dobereiner's Triads.

(c) State Modern Periodic Law. 3

18. (a) In the process of respiration, state the function of alveoli.

(b) Rate of breathing in aquatic organisms is much faster than that in terrestrial organisms. Give reasons.

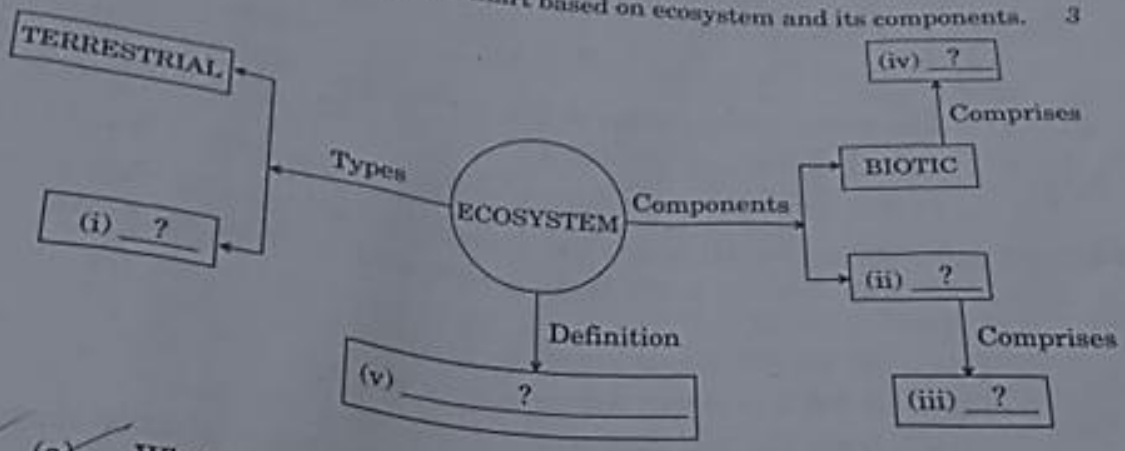
(c) Complete the following pathway showing the breakdown of glucose : 3

Glucose (6-carbon molecules) $\xrightarrow{\text{in cytoplasm}}$ (i) ? (3-carbon molecules + energy) $\xrightarrow[\text{in mitochondria}]{\text{Presence of } O_2}$ (ii) ? + H_2O + energy

19. What is meant by trophic level in a food chain ? Construct a terrestrial food chain with four trophic levels. The energy flow in a food chain is always unidirectional. Why ? 3

OR

Complete the following flow chart based on ecosystem and its components. 3



20. (a) What provides nutrition to human sperms ? State the genetic constitution of a sperm.

(b) Mention the chromosome pair present in zygote which determines the sex of (i) a female child, and (ii) a male child. 3

21. Define the following :

(a) Speciation

(b) Natural Selection

(c) Genetic Drift 3

22. A child is standing in front of a magic mirror. She finds the image of her head bigger, the middle portion of her body of the same size and that of the legs smaller. Explain the construction of the magic mirror using different types of mirrors. Also state the reasons in support of your answer. 3

23. A student uses spectacles of focal length – 2·5 m.

(a) Name the defect of vision he is suffering from.

(b) Which lens is used for the correction of this defect ?

(c) List two main causes of developing this defect.

(d) Compute the power of this lens. 3

OR

Give reasons :

(a) Red colour is selected for danger signals.

(b) The sky appears dark in space.

(c) The time difference between actual sunset and apparent sunset is about 2 minutes. 3

24. (a) A coil of insulated wire is connected to a galvanometer. What would be observed if a strong bar magnet with its south pole towards one face of the coil is

(i) moved quickly toward it ?

(ii) moved quickly away from it ?

(iii) held stationary near it ?

(b) Name the phenomena involved.

(c) State the conclusion based on the observations in (i), (ii) and (iii). 3

SECTION C

25. Consider the molecular formula of the carbon compounds (a) and (b) given below :

(a) C_3H_8O

(b) $C_3H_6O_2$

(i) Identify the functional groups in (a) and (b) and write their structures.

(ii) Are (a) and (b) isomers ? Give reason.

(iii) What happens when alkaline $KMnO_4$ is added, drop by drop, into a test tube containing warm propanol ? Write the chemical equation for the reaction and state the role of alkaline $KMnO_4$ in this reaction. 5

P.T.O.

(a) Name the mode of reproduction of the following organisms and state the important feature of each mode :

(i) Planaria

(ii) Hydra

(iii) Rhizopus

(b) We can develop new plants from the leaves of Bryophyllum. Comment.

(c) List two advantages of vegetative propagation over other modes of reproduction. 5

28. Design an activity to show that chlorophyll is essential for photosynthesis. 5

29. (a) Draw a labelled ray diagram to show the path of a ray of light incident obliquely on one face of a glass slab.

(b) Calculate the refractive index of the material of a glass slab. Given that the speed of light through the glass slab is 2×10^8 m/s and in air is 3×10^8 m/s.

(c) Calculate the focal length of a lens, if its power is $-2{\cdot}5$ D. 5

OR

(a) A person suffering from myopia (near-sightedness) was advised to wear corrective lens of power $-2{\cdot}5$ D. A spherical lens of same focal length was taken in the laboratory. At what distance should a student place an object from this lens so that it forms an image at a distance of 10 cm from the lens ?

(b) Draw a ray diagram to show the position and nature of the image formed in the above case. 5

30. (a) State Ohm's Law.

(b) How is an ammeter connected in an electric circuit ?

(c) The power of a lamp is 100 W. Find the energy consumed by it in 1 minute.

(d) A wire of resistance 5 Ω is bent in the form of a closed circle. Find the resistance between two points at the ends of any diameter of the circle. 5