

**Series : JBB/3**

**SET - 2**

कोड नं.  
Code No. **31/3/2**

रोल नं.  
Roll No. **CBSE BOARD PAPER 2020**



परीक्षार्थी कोड को उत्तर-पुस्तिका के मुख-पृष्ठ पर अवश्य लिखें।  
Candidates must write the Code on the title page of the answer-book.

नोट	NOTE
(I) कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 23 हैं।	(I) Please check that this question paper contains 23 printed pages.
(II) प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए कोड नम्बर को छात्र उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें।	(II) Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
(III) कृपया जाँच कर लें कि इस प्रश्न-पत्र में 30 प्रश्न हैं।	(III) Please check that this question paper contains 30 questions.
(IV) कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, प्रश्न का क्रमांक अवश्य लिखें।	(IV) Please write down the Serial Number of the question in the answer-book before attempting it.
(V) इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है। प्रश्न-पत्र का वितरण पूर्वाह्न में 10.15 बजे किया जाएगा। 10.15 बजे से 10.30 बजे तक छात्र केवल प्रश्न-पत्र को पढ़ेंगे और इस अवधि के दौरान वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे।	(V) 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.



**विज्ञान**

**SCIENCE**

निर्धारित समय : 3 घण्टे

Time allowed : 3 hours

अधिकतम अंक : 80

Maximum Marks : 80

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**098B**

1

P.T.O.

**General Instructions :**

Read the following instructions very carefully and strictly follow them :

- (i) The question paper comprises **three** Sections, **A, B** and **C**. There are 30 questions in the question paper. **All** questions are compulsory.
- (ii) **Section A** – all questions / or parts (question no. 1 to 14) thereof in this section 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**.
- (iii) **Section B** – question 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** – question 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) Answer 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. Define electropositivity. 1

OR

The atomic radii of first group elements are given below :

Group-I element	Atomic Radii (pm)
Na	86
K	231
Rb	244
Cs	282

State the reason behind the observed trend in the above elements. 1

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P.T.O.

2. How are covalent bonds formed? 1

3. Questions numbers 3(a) to 3(d) are based on table given below. Study the table in which the levels of Thyroid Stimulating Hormone (TSH) in women are given and answer the questions that follow on the basis of understanding of the following paragraph and the related studied concepts.

Age Range	Normal (mU/L)	Low (mU/L)
18 – 29 years	0.4 – 2.34 mU/L	< 0.4 mU/L
30 – 49 years	0.4 – 4.0 mU/L	< 0.4 mU/L
50 – 79 years	0.46 – 4.68 mU/L	< 0.46 mU/L

Women are at greater risk for developing abnormal TSH levels during menstruation, while giving birth and after going through menopause. Around 5% of women in the United States have some kind of thyroid problem compared to 3% of men. Despite claims that high TSH increases your risk for heart disease, a 2013 study found no link between high TSH and heart diseases. But a 2017 study showed that older women are especially at risk for developing thyroid cancer if they have high TSH levels along with thyroid nodules.

- (a) A 35 year old woman has TSH level 6.03 mU/L. What change should she bring in her diet to control this level? 1
- (b) When do women face a greater risk of abnormal TSH level? 1
- (c) State the consequence of low TSH level. 1
- (d) Name the mineral that is responsible for synthesis of hormone secreted by thyroid gland. 1

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P.T.O.

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

The Tehri dam is the highest dam in India and one of the highest in the World. The Tehri dam withholds a reservoir of capacity  $4.0 \text{ km}^3$  and surface area  $52 \text{ km}^2$ . It is used for irrigation, municipal water supply and the generation of 1000 MW of hydro electricity.

The Tehri Dam has been the object of protests. Environment activist Shri Sunder Lal Bahuguna led the "Anti Tehri Dam Movement" from 1980s to 2014. The protest was against the displacement of town inhabitants and environmental consequences of the weak ecosystem. The relocation of more than 1,00,000 people from the area has led to protracted legal battles over resettlement rights and ultimately resulted in the delayed completion of the project.

- (a) How is hydropower harnessed ? 1  
 (b) Define 1 MW. 1  
 (c) Mention two disadvantages of constructing Tehri Dam. 1  
 (d) What happens when water from great heights is made to fall on blades of turbine ? 1

5. An element 'X' is forming an acidic oxide. Its position in modern periodic table will be

- (a) Group 1 and Period 3  
 (b) Group 2 and Period 3  
 (c) Group 13 and Period 3  
 (d) Group 16 and Period 3 1

OR

Consider the following statements about an element 'X' with number of protons 13.

- (A) It forms amphoteric oxide  
 (B) Its valency is three  
 (C) The formula of its chloride is  $\text{XCl}_3$

The correct statement(s) is/are

- (a) only (A)  
 (b) only (B)  
 (c) (A) and (C)  
 (d) (A), (B) and (C) 1



6. An aqueous solution 'A' turns phenolphthalein solution pink. On addition of an aqueous solution 'B' to 'A', the pink colour disappears. The following statement is true for solution 'A' and 'B'.
- (a) A is strongly basic and B is a weak base.
  - (b) A is strongly acidic and B is a weak acid.
  - (c) A has pH greater than 7 and B has pH less than 7.
  - (d) A has pH less than 7 and B has pH greater than 7. 1
7. In which of the following, the identity of initial substance remains unchanged ?
- (a) Curdling of milk
  - (b) Formation of crystals by process of crystallisation
  - (c) Fermentation of grapes
  - (d) Digestion of food 1
8. Several factories were pouring their wastes in rivers A and B. Water samples were collected from these two rivers. It was observed that sample collected from river A was acidic while that of river B was basic. The factories located near A and B are
- (a) Soaps and detergents factories near A and alcohol distillery near B.
  - (b) Soaps and detergents factories near B and alcohol distillery near A.
  - (c) Lead storage battery manufacturing factories near A and soaps and detergents factories near B.
  - (d) Lead storage battery manufacturing factories near B and soaps and detergents factories near A. 1

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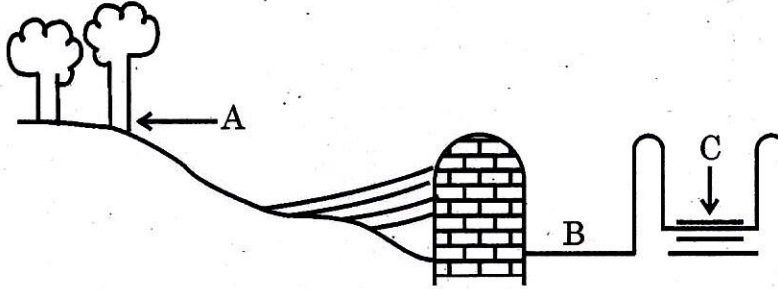


9

P.T.O.

9. A diagram of traditional water harvesting system is given below :

The statement which defines the system and its parts is



- (a) This is an ideal setting of the Khadin system and A = Catchment area; B = Saline area & C = Shallow dugwell
- (b) This is an ideal setting of the Shallow dugwell system and A = Catchment area; B = Saline area and C = Khadin
- (c) This is an ideal setting of Catchment area and A = Khadin, B = Saline area and C = Shallow dugwell
- (d) This is showing Saline area and A = Catchment area; B = Khadin and C = Shallow dugwell

1

**OR**

The major ill effect of mono culture practice in forests is on the

- (a) biodiversity which faces large destruction
- (b) local people whose basic needs can no longer be met from such forests
- (c) industries
- (d) forest department

1

10. The maximum resistance which can be made using four resistors each of resistance  $\frac{1}{2} \Omega$  is.

- (a)  $2 \Omega$
- (b)  $1 \Omega$
- (c)  $2.5 \Omega$
- (d)  $8 \Omega$

1

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11

P.T.O.

11. A cylindrical conductor of length 'l' and uniform area of cross section 'A' has resistance 'R'. The area of cross section of another conductor of same material and same resistance but of length '2l' is

- (a)  $\frac{A}{2}$
- (b)  $\frac{3A}{2}$
- (c) 2A
- (d) 3A

$$R = \frac{\rho l}{A} \quad R = \frac{\rho 2l}{A}$$

$$2 = \frac{2l}{l} \frac{A}{A}$$

1

12. The sky appears dark to passengers flying at very high altitudes mainly because :

- (a) Scattering of light is not enough at such heights.
- (b) There is no atmosphere at great heights.
- (c) The size of molecules is smaller than the wavelength of visible light.
- (d) The light gets scattered towards the earth.

1

**Note :** 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 (a), (b), (c) and (d) as given below :

- (a) Both (A) and (R) are true and (R) is correct explanation of the assertion.
- (b) Both (A) and (R) are true but (R) is not the correct explanation of the assertion.
- (c) (A) is true but (R) is false.
- (d) (A) is false but (R) is true.

13. **Assertion (A) :** Alloys are commonly used in electrical heating devices like electric iron and heater.

**Reason (R) :** Resistivity of an alloy is generally higher than that of its constituent metals but the alloys have low melting points than their constituent metals. (c)

1

14. **Assertion (A) :** Following are the members of a homologous series :



**Reason (R) :** A series of compounds with same functional group but differing by  $-\text{CH}_2-$  unit is called a homologous series.

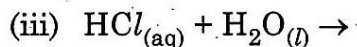
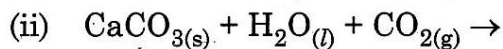
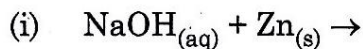
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**Section - B**

15. Complete and balance the following chemical equations :



**3**

**OR**

During electrolysis of brine, a gas 'G' is liberated at anode. When this gas 'G' is passed through slaked lime, a compound 'C' is formed, which is used for disinfecting drinking water.

(i) Write formula of 'G' and 'C'.

(ii) State the chemical equation involved.

(iii) What is common name of compound 'C' ? Give its chemical name.

**3**

16. Mention with reason the colour changes observed when :

(i) silver chloride is exposed to sunlight.

(ii) copper powder is strongly heated in the presence of oxygen.

(iii) a piece of zinc is dropped in copper sulphate solution.

**3**

17. Three elements X, Y and Z have atomic numbers 7, 8 and 9 respectively.

(a) Arrange them in the decreasing order of their atomic radii.

(b) Which of the three is most electronegative ? Why ?

(c) Write the formula of compound formed between

(i) X and Y

(ii) X and Z

**3**

18. (a) State the role played by the following in the process of digestion.

(i) Enzyme trypsin

(ii) Enzyme lipase

(b) List two functions of finger like projections present in the small intestine.

**3**

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**15**

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19. (a) Define ecosystem.  
 (b) Autotrophs are at the first level of food chain. Give reason.  
 (c) In a food chain of frogs, grass, insects and snakes assign trophic level to frogs. To which category of consumers do they belong to ? **3**

**OR**

- (a) Explain the role of UV radiation in producing ozone layer.  
 (b) Mention the reaction involved.  
 (c) Why is excessive use of CFCs a cause of concern ? **3**
20. List three factors that could lead to speciation. Which of these cannot be a major factor in the speciation of a self-pollinating plant species and why ? **3**

21. A green stemmed rose plant denoted by GG and a brown stemmed rose plant denoted by gg are allowed to undergo a cross with each other.

- (a) List your observations regarding  
 (i) Colour of stem in their  $F_1$  progeny *green*  
 (ii) Percentage of brown stemmed plants in  $F_2$  progeny if  $F_1$  plants are self pollinated.  
 (iii) Ratio of GG and Gg in the  $F_2$  progeny.  
 (b) Based on the finding of this cross, what conclusion can be drawn ? **3**
22. (a) Water has refractive index 1.33 and alcohol has refractive index 1.36. Which of the two medium is optically denser ? Give reason for your answer.  
 (b) Draw a ray diagram to show the path of a ray of light passing obliquely from water to alcohol.  
 (c) State the relationship between angle of incidence and angle of refraction in the above case. **3**

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P.T.O.

23. (a) With the help of labelled ray diagram show the path followed by a narrow beam of monochromatic light when it passes through a glass prism.
- (b) What would happen if this beam is replaced by a narrow beam of white light ? 3

**OR**

- (a) A person is suffering from both myopia and hypermetropia.
- (i) What kind of lenses can correct this defect ?
- (ii) How are these lenses prepared ?
- (b) A person needs a lens of power + 3D for correcting his near vision and -3D for correcting his distant vision. Calculate the focal lengths of the lenses required to correct these defects. 3

24. Give reasons for the following :


- (i) There is either a convergence or a divergence of magnetic field lines near the ends of a current carrying straight solenoid.
- (ii) The current carrying solenoid when suspended freely rests along a particular direction.
- (iii) The burnt out fuse should be replaced by another fuse of identical rating. 3

**Section - C**

25. Write balanced chemical equations to explain what happens, when

- (i) Mercuric oxide is heated.  $HgO \xrightarrow{\Delta} Hg + O_2$
- (ii) Mixture of cuprous oxide and cuprous sulphide is heated.
- (iii) Aluminium is reacted with manganese dioxide.
- (iv) Ferric oxide is reduced with aluminium.
- (v) Zinc carbonate undergoes calcination. 5

**OR**

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**P.T.O.**

- (i) By the transfer of electrons, illustrate the formation of bond in magnesium chloride and identify the ions present in this compound.
- (ii) Ionic compounds are solids. Give reasons.
- (iii) With the help of a labelled diagram show the experimental set up of action of steam on a metal. 5

26. (a) Carry out following conversions :

- (i) Ethanol to ethene
- (ii) Ethanol to Ethanoic acid

(b) Differentiate between addition reaction and substitution reaction. Give one example of each. 5

27. (a) How do leaves of plants help in excretion ? Explain briefly.

(b) Describe the structure and function of a nephron. 5

28. (a) Draw a diagram showing germination of pollen on stigma of a flower and mark on it the following organs/parts :

- (i) Pollen Grain
- (ii) Pollen tube
- (iii) Stigma
- (iv) Female germ cell

(b) State the significance of pollen tube.

(c) Name the parts of flower that develop after fertilization into

- (i) Seed
- (ii) Fruit

5

**OR**

(a) "Use of a condom is beneficial for both the sexes involved in a sexual act." Justify this statement giving two reasons.

(b) How do oral contraceptive help in avoiding pregnancies ?

(c) What is sex selective abortion ? How does it affect a healthy society ? (State any one consequence) 5

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**P.T.O.**

29. (a) Define Power and state its SI unit.
- (b) A torch bulb is rated 5 V and 500 mA. Calculate its
- Power
  - Resistances
  - Energy consumed when it is lighted for  $2\frac{1}{2}$  hours.

5

30. (a) A security mirror used in a big showroom has radius of curvature 5 m. If a customer is standing at a distance of 20 m from the cash counter, find the position, nature and size of the image formed in the security mirror.

- (b) Neha visited a dentist in his clinic. She observed that the dentist was holding an instrument fitted with a mirror. State the nature of this mirror and reason for its use in the instrument used by dentist.

5

**OR**

Rishi went to a palmist to show his palm. The palmist used a special lens for this purpose.

- State the nature of the lens and reason for its use.
- Where should the palmist place/hold the lens so as to have a real and magnified image of an object ?
- If the focal length of this lens is 10 cm and the lens is held at a distance of 5 cm from the palm, use lens formula to find the position and size of the image.

5

