



Series ωZWYX/C



Set-5

**प्रश्न-पत्र कोड
Q.P. Code 31(B)**

रोल नं.

Roll No.

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परीक्षार्थी प्रश्न-पत्र कोड को उत्तर-पुस्तिका के मुख-पृष्ठ पर अवश्य लिखें।

Candidates must write the Q.P. Code on the title page of the answer-book.

विज्ञान (केवल दृष्टिबाधित परीक्षार्थियों के लिए) **SCIENCE**

(FOR VISUALLY IMPAIRED CANDIDATES ONLY)

निर्धारित समय : 3 घण्टे

अधिकतम अंक : 80

Time allowed : 3 hours

Maximum Marks : 80

- कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 27 हैं।
- प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को परीक्षार्थी उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें।
- कृपया जाँच कर लें कि इस प्रश्न-पत्र में 39 प्रश्न हैं।
- कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर-पुस्तिका में प्रश्न का क्रमांक अवश्य लिखें।
- 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।
- Please check that this question paper contains 27 printed pages.
- Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains 39 questions.
- **Please write down the serial number of the question in the answer-book before attempting it.**
- 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.

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General Instructions :

Read the following instructions very carefully and strictly follow them :

- (i) *This question paper comprises **39** questions. All questions are compulsory.*
- (ii) *This question paper is divided into **five** sections – **A, B, C, D and E**.*
- (iii) ***Section A** – Questions No. **1** to **20** are Multiple Choice Questions. Each question carries **1** mark.*
- (iv) ***Section B** – Questions No. **21** to **26** are Very Short Answer type questions. Each question carries **2** marks. Answer to these questions should be in the range of **30** to **50** words.*
- (v) ***Section C** – Questions No. **27** to **33** are Short Answer type questions. Each question carries **3** marks. Answer to these questions should in the range of **50** to **80** words.*
- (vi) ***Section D** – Questions No. **34** to **36** are Long Answer type questions. Each question carries **5** marks. Answer to these questions should be in the range of **80** to **120** words.*
- (vii) ***Section E** – Questions No. **37** to **39** are of **3** Source-based / Case-based units of assessment carrying **4** marks each with sub-parts.*
- (viii) *There is no overall choice. However, an internal choice has been provided in some sections. Only one of the alternatives has to be attempted in such questions.*

SECTION A

*This section has **20** Multiple Choice Questions (Q.No. **1** – **20**). All questions are **compulsory**. **20×1=20***

1. In order to balance the following chemical equation, the values of x and y respectively are :
$$3\text{Fe} + x \text{H}_2\text{O} \longrightarrow \text{Fe}_3\text{O}_4 + y \text{H}_2$$

(a) 2, 2	(b) 4, 2
(c) 2, 4	(d) 4, 4
2. The aqueous solution of which one of the following salts will have pH more than seven ?

(a) NH_4Cl	(b) NaCl
(c) Na_2CO_3	(d) NaNO_3









For Questions number 17 to 20, two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of the Assertion (A).
 - (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is **not** the correct explanation of the Assertion (A).
 - (c) Assertion (A) is true, but Reason (R) is false.
 - (d) Assertion (A) is false, but Reason (R) is true.
- 17.** *Assertion (A)* : Ethyne is widely used for cutting and welding iron and steel.
Reason (R) : Ethyne is an unsaturated hydrocarbon involving carbon-to-carbon triple bond.
- 18.** *Assertion (A)* : ATP is the energy currency for most of the cellular processes.
Reason (R) : Endothermic processes in the cell use ATP to carry out reactions.
- 19.** *Assertion (A)* : Pancreas produces a hormone called insulin.
Reason (R) : Insulin increases the blood sugar level in the human body.
- 20.** *Assertion (A)* : A current carrying straight solenoid, when suspended freely rests in geographical north-south direction.
Reason (R) : Earth behaves as a huge magnet which has the north pole towards the geographical south, whereas the current carrying solenoid behaves like a bar magnet.



SECTION B

21. Give one example each of the reaction in which :

- (a) (i) a more reactive metal displaces a less reactive metal from its aqueous salt solution and the colour of the solution changes.
(ii) an insoluble precipitate is formed. 2

OR

(b) When a zinc plate is dipped in ferrous sulphate solution for some time, it is observed that the pale green colour of the solution disappears.

- (i) Explain the observation.
(ii) Write the chemical equation for the reaction taking place. 2

22. Name the site of complete digestion in the human body and write the name of the end products formed of
(i) carbohydrates, (ii) fats, and (iii) proteins. 2

23. Give an example of a plant hormone that promotes growth. Explain how this hormone promotes the growth of tendril around a support. 2

24. “Pancreas has dual nature.” Justify this statement with an example. 2



25. (a) A student cannot see distinctly the charts hanging in the science laboratory. Name the defect of vision he/she is suffering from. List two causes of this defect. Suggest the type of lenses for the modification of this defect. 2

OR

- (b) A person cannot see distinctly the objects placed at the least distance of distinct vision for a normal eye. However, he can easily read a newspaper by placing it at a distance of 40 cm from his eyes. Name the defect of vision in this case. List its two causes. Suggest the type of lenses for his spectacles. 2
26. Name two non-biodegradable substances. In the following food chain, maximum concentration of harmful non-biodegradable chemicals was found in the bodies of hawks. Why ?

Grass —→ Rabbits —→ Snakes —→ Hawks

2

SECTION C

27. Consider the types of reaction mentioned below in (i) and (ii) :
- (i) $\text{AB} + \text{C}_2\text{B} \longrightarrow \text{A}(\text{BC})_2$
- (ii) $\text{ABO}_3 \longrightarrow \text{AO} + \text{BO}_2$
- (a) Identify the types of reactions mentioned in the chemical equations (i) and (ii).
- (b) Give one example for each type of reaction in the form of word equation or chemical equation. 3



- 28.** You have three test tubes containing three colourless liquids, say conc. sulphuric acid, conc. solution of sodium hydroxide and conc. solution of sodium sulphate. You also have strips of pH paper.
- (a) How would identify these three liquids using pH paper strips ?
- (b) Which two liquids, when mixed together in proper quantities can form a neutral salt solution ?
- (c) Write the chemical equation for the reaction that will occur between the two liquids mixed in (b). 3
- 29.** (a) List three events that occur during the process of photosynthesis in plants. 3
- OR**
- (b) What is lymph ? How is lymph different from blood plasma in composition ? List two functions of lymph. 3
- 30.** A candle flame is placed at a distance of 18 cm from the optical centre of a convex lens. If its image is formed on a screen placed at a distance of 36 cm from the lens, answer the following questions :
- (a) What is the magnification of the image formed ?
- (b) What is the focal length of the lens ? Use the “Lens Formula” to determine it. 3



- 31.** (a) Define the following terms in the context of spherical mirrors :
- (i) Pole
 - (ii) Centre of curvature
 - (iii) Principal axis
 - (iv) Principal focus
- (b) An object is placed at a distance of 60 cm from the pole of a concave mirror. If its real and inverted image is formed on a screen placed at a distance of 60 cm in front of the mirror, what is the focal length of the mirror ? Give justification for your answer. 3
- 32.** (a) State Ohm's law. List two factors on which the resistance of a cylindrical conductor at a given temperature depends. A wire was drawn into a wire of double its length by melting it. If the resistance of the old wire was R , what is the resistance of the new wire ? 3
- OR**
- (b) (i) Write the formula for finding the value of the equivalent resistance of three resistors of resistance R_1 , R_2 and R_3 , when the resistors are connected in (i) series, and (ii) parallel.
- (ii) List two advantages of connecting electrical devices in parallel with the source of electricity instead of connecting them in series. 3
- 33.** Define ecosystem. List two artificial (man-made) ecosystems. Natural ecosystems like forests and lakes do not require regular cleaning, whereas the artificial ecosystems start giving foul smell if not cleaned regularly. Why ? 3



SECTION D

34. (a) Write the molecular formula of methane and ethane, stating the general formula of the homologous series to which these compounds belong. What is the difference in the molecular mass in between the two successive members of a homologous series ?
- (b) Write the name and molecular formula of an alcohol having two carbon atoms in its molecule. Write balanced chemical equation to indicate what happens when this compound is heated at 443 K with excess conc. H_2SO_4 . Name the main product formed in the reaction stating the function of conc. H_2SO_4 in the reaction. 5

OR

- (a) How do the following conversions take place ? Write chemical equation for each :
- (i) Ethanol to Ethanoic acid
 - (ii) Ethene to Ethane
- (b) Give one example each with chemical equation for the following reactions :
- (i) Combustion reaction
 - (ii) Substitution reaction
 - (iii) Saponification reaction
35. (a) What is regeneration ? Which types of cells are used by such multicellular organisms to regenerate ? Name the organism which exhibits this process.
- (b) State one function of each of the following parts of the human male reproductive system :
- (i) Vas deferens
 - (ii) Testes
 - (iii) Prostate glands
- 5

OR



- (a) What is meant by pollination ? Name and differentiate between the two types of pollination.
- (b) What happens to the pollen which falls on a suitable stigma ?
- (c) Mention the post-fertilisation changes that occur in
(i) Ovary and (ii) Ovule in the flower. 5
36. (a) What is a solenoid ? When a current is passed through a long, hollow and straight solenoid, a magnetic field is produced. Where is the strength of the magnetic field produced maximum and what is the pattern of the magnetic field at this place ?
- (b) State Fleming's Left Hand Rule. Apply this rule to solve the following problem :
A straight conductor is placed in east-west direction in a uniform magnetic field. If on passing current from east to west, the conductor moves towards north, what is the direction of magnetic field ? 5

SECTION E

Q.No. 37 to 39 are Source-based/Case-based questions with 3 sub-parts. Internal choice is provided in one of these sub-parts.

37. When a ray of light moving in a medium enters obliquely in another medium, it bends from its path. This phenomenon is called refraction of light. The ability of a medium to refract light is expressed in terms of optical density. The term optical density is not the same as mass density. If we compare two optical media, the one with the larger absolute refractive index is an optically denser medium than the other. Also, the speed of light through a given medium is inversely proportional to its optical density.



- (a) Define the term ‘absolute refractive’ index of a medium. 1
- (b) Refractive indices of glass, water and carbon disulphide are 1.50, 1.33 and 1.62 respectively. In which one of these media is the speed of light (i) highest, and (ii) lowest ? 1
- (c) (i) The absolute refractive indices of glass and water are $3/2$ and $4/3$ respectively. If the speed of light in water is 2.25×10^8 m/s, find the speed of light in (I) vacuum, and (II) glass. 2

OR

- (ii) The absolute refractive indices of glass and water are $3/2$ and $4/3$ respectively. Find the refractive index of water with respect to glass. 2

38. The melting points and the boiling points of ionic compounds are comparatively much higher than that of the covalent compounds. The ionic compounds are so called because they are formed by the transfer of electrons from a metal to a non-metal. In the ionic compounds, the transfer of electrons from one element to the other is controlled by their electronic configurations. It is because every element tends to attain a completely filled valence shell of its nearest noble gas or a stable octet.
- (a) The atomic number of sodium is 11. Write its electronic configuration and state the number of electrons it can lose to have a stable octet. 1
- (b) The atomic number of chlorine is 17. Write its electronic configuration. Name the nearest noble gas whose octet chlorine will attain after gaining one electron. 1



- (c) (i) Show the formation of MgO by the transfer of electrons. The atomic numbers of magnesium and oxygen are 12 and 8 respectively. 2

OR

- (ii) Write the symbols and names of the anion and the cation present in the aqueous solution of the following compounds :
(I) Sodium chloride
(II) Potassium nitrate 2

39. Besides heart, the human circulatory system consists of a network of closed branching blood vessels and the blood that circulates continuously in all parts of the human body. The human heart is a muscular organ which is as big as our fist. It has four chambers — two upper chambers called atria and two lower chambers called ventricles. The right side of the human heart is separated from the left side by a dividing wall, which is known as septum.

- (a) Name the smallest blood vessel and state its role in the circulation of blood. 1
(b) Write the importance of platelets in the human blood. 1
(c) (i) Write in tabular form, two differences between an artery and a vein. 2

OR

- (ii) Why is blood circulation in the human heart called double circulation ? Explain. 2