



Series Z1XYW/6

SET ~ 3

प्रश्न-पत्र कोड

Q.P. Code

31/6/3

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.

- कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 31 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 परीक्षार्थी 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 31 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 candidates 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



31/6/3

112 C

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P.T.O.



General Instructions :

Read the following instructions carefully and strictly follow them :

- (i) *This question paper contains **39** questions. **All** questions are compulsory.*
- (ii) *Question paper is divided into **FIVE** sections viz. Section **A, B, C, D** and **E**.*
- (iii) *In section **A** - question number **1** to **20** are Multiple Choice Questions (MCQs) carrying **1** mark each.*
- (iv) *In section **B** - question number **21** to **26** are Very Short Answer (VSA) type questions carrying **2** marks each. Answer to these questions should be in the range of **30** to **50** words.*
- (v) *In section **C** - question number **27** to **33** are Short Answer (SA) type questions carrying **3** marks each. Answer to these questions should be in the range of **50** to **80** words.*
- (vi) *In section **D** - question number **34** to **36** are Long Answer (LA) type questions carrying **5** marks each. Answer to these questions should be in the range of **80** to **120** words.*
- (vii) *In section **E** - question number **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.*

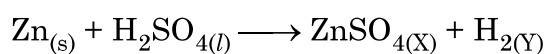


SECTION – A

Select and write **one** most appropriate option out of the four options given for each of the questions **1 – 20**.

1. Select the appropriate state symbols of the products given as X and Y in the following chemical equation by choosing the correct option from table given below :

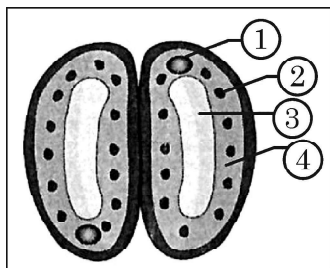
1



	(X)	(Y)
(a)	(s)	(l)
(b)	(aq)	(g)
(c)	(aq)	(s)
(d)	(g)	(aq)

2. In the given diagram of a closed stomata : (1), (2), (3) and (4) respectively are

1

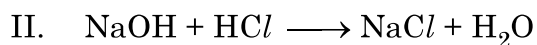
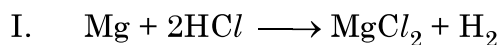


- (a) nucleus, chloroplast, guard cell, vacuole
(b) nucleus, chloroplast,, vacuole, guard cell
(c) chloroplast, nucleus, vacuole, guard cell
(d) vacuole, guard cell, nucleus, chloroplast



3. Consider the following chemical equation I and II

1



The correct statement about these equations is –

- (a) 'I' is a displacement reaction and 'II' is a decomposition reaction.
(b) 'I' is a displacement reaction and 'II' is double displacement reaction.
(c) Both 'I' and 'II' are displacement reactions.
(d) Both 'I' and 'II' are double-displacement reactions.
4. There are four solutions A, B, C, and D with pH values as follows :

Solution	A	B	C	D
pH	2.0	7.0	8.0	12.0

Which solution(s) would liberate hydrogen gas with zinc ?

1

- (a) A only
(b) D only
(c) A and D
(d) B and C
5. Walking in a straight line and riding a bicycle are the activities which are possible due to a part of the brain. Choose the correct location and name of this part from the given table :

1

	Part of the Brain	Name
(a)	Fore brain	Cerebrum
(b)	Mid brain	Hypothalamus
(c)	Hind brain	Cerebellum
(d)	Hind brain	Medulla



6. Metal oxides generally react with acids, but few oxides of metal also react with bases. Such metallic oxides are : 1

I. MgO

II. ZnO

III. Al_2O_3

IV. CaO

(a) I and II

(b) II and III

(c) III and IV

(d) I and IV

7. In torch lights and head lights of vehicles, the bulb is placed 1

(a) between the pole and the focus of the reflector.

(b) very near to the focus of the reflector.

(c) between the focus and centre of curvature of the reflector.

(d) at the centre of curvature of the reflector.

8. Few drops of aqueous solution of ammonium chloride are put on a universal indicator paper. The paper turns pink.

Study the following table and choose the correct option.

1

Nature	Ammonium chloride is a salt of	Range of pH
(a) acidic	weak acid and strong base	less than 7
(b) basic	weak acid and strong base	more than 7
(c) acidic	strong acid and weak base	less than 7
(d) basic	strong acid and strong base	7



9. Bronze is an alloy of 1
- (a) Copper and Zinc (b) Aluminium and Tin
- (c) Copper, Tin and Zinc (d) Copper and Tin

10. Choose the option giving correct matching the items given in Column – I & II. 1

Column – I	Column – II
A. Physical environment	(i) Ozone layer depletion
B. Exposure to UV radiation	(ii) Bacteria and Fungi
C. Chlorofluoro Carbon compounds	(iii) Abiotic components
D. Decomposers	(iv) Skin Cancer

- | | | | |
|-----------|------|------|------|
| A | B | C | D |
| (a) (iii) | (i) | (iv) | (ii) |
| (b) (iii) | (iv) | (i) | (ii) |
| (c) (iii) | (iv) | (ii) | (i) |
| (d) (iii) | (i) | (ii) | (iv) |

11. The thread like structures that develop on a moist slice of bread in Rhizopus are 1
- (a) Sporangia (b) Filaments
- (c) Rhizoids (d) Hyphae

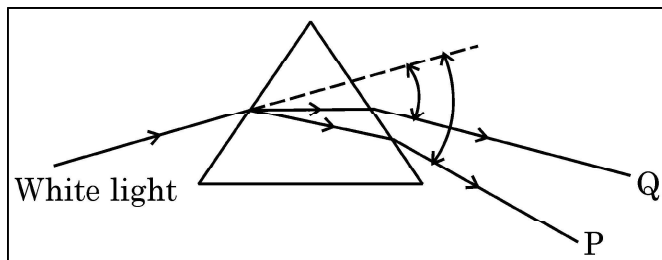
12. The change in the focal length of an eye lens in human beings is caused by the action of 1
- (a) optic nerves (b) ciliary muscles
- (c) retina (d) cornea



13. The magnetic field inside a long straight current carrying solenoid : 1

- (a) is zero.
- (b) decreases as we move towards its end.
- (c) increases as we move towards its end.
- (d) is same at all points.

14. In the following diagram showing dispersion of white light by a glass prism, the colours 'P' and 'Q' respectively are – 1



- | | |
|--------------------|----------------------|
| (a) Red and Violet | (b) Violet and Red |
| (c) Red and Blue | (d) Orange and Green |

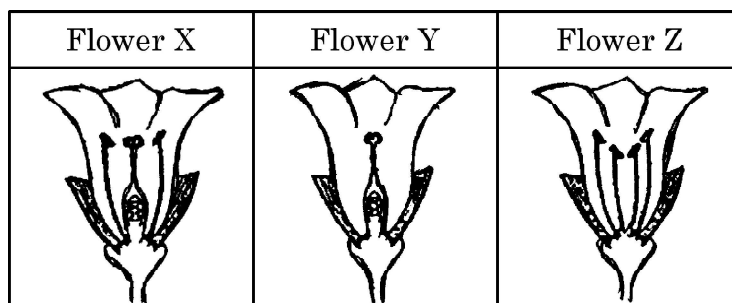
15. In an experiment with pea plants, a pure tall plant (TT) is crossed with a pure short plant (tt). The ratio of pure tall plant to pure short plants in F_2 generation will be 1

- | | |
|-----------|-----------|
| (a) 1 : 3 | (b) 3 : 1 |
| (c) 1 : 1 | (d) 2 : 1 |



16. Consider the following three flowers namely X, Y and Z. Which flower(s) would develop into a fruit ?

1



- (a) 'X' only
(b) 'Z' only
(c) 'X' and 'Y' only
(d) 'Y' and 'Z'

Q. No. 17 to 20 are Assertion – Reasoning based questions.

These consists of two statements –

Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below :

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

17. **Assertion (A) :** The energy which passes to the herbivores does not come back to autotrophs.

1

Reason (R) : The flow of energy in a food chain is unidirectional.

18. **Assertion (A) :** Melting point and boiling point of ethanol are lower than that of sodium chloride.

1

Reason (R) : The forces of attraction between the molecules of ionic compounds are very strong.



19. **Assertion (A) :** Testes in human males are located outside the abdominal cavity in scrotum. 1

Reason (R) : Scrotum provides a lower temperature than the normal body temperature for sperm formation.

20. **Assertion (A) :** It is advised that while diluting an acid one should add water to acid and not acid to water keeping the solution continuously stirred. 1

Reason (R) : The process of dissolving an acid into water is highly exothermic.

SECTION – B

Q. No. 21 to 26 are Very Short Answer Questions.

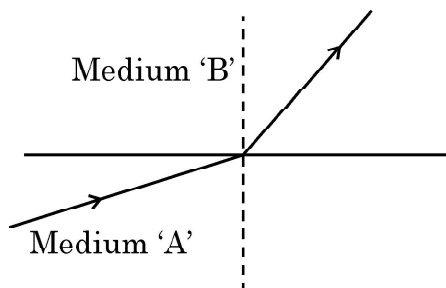
21. Let the resistance of an electrical device remain constant, while the potential difference across its two ends decreases to one fourth of its initial value. What change will occur in the current through it ? State the law which helps us in solving the above stated question. 2
22. (a) How is an electric impulse created in human nervous system ? Identify the parts of a neuron which helps the nerve impulse to travel 2
- (i) towards the cell body
- (ii) away from the cell body

OR

- (b) With the help of an example, explain how does the feedback mechanism regulate the hormone secretion. 2



23. A light ray enters from medium A to medium B as shown in the figure.

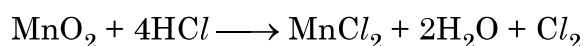


- (a) Which one of the two media is denser w.r.t. other medium ? Justify your answer. 1
- (b) If the speed of light in medium A is v_a and in medium B is v_b , what is the refractive index of B with respect to A. 1

OR

- (a) A ray of light starting from diamond is incident on the interface separating diamond and water. Draw a labelled ray diagram to show the refraction of light in this case. 1
- (b) Absolute refractive indices of diamond and water are 2.42 and 1.33 respectively. Find the value of refractive index of water w.r.t. diamond. 1

24. State whether the given chemical reaction is a redox reaction or not. Justify your answer. 2



25. Give the name of the enzyme present in the fluid in our mouth cavity. State the gland which produces it. What would happen to the digestion process if this gland stops secreting this enzyme ? 2
26. Draw magnetic field lines produced around a straight current carrying conductor passing through a cardboard. How will the strength of the magnetic field change when the point where magnetic field is to be determined is moved away from the conductor ? 2



SECTION – C

Q. No. 27 to 33 are Short Answer Questions.

27. What is a solenoid ? When does a solenoid behave as a magnet ? Draw the pattern of the magnetic field produced inside it showing the directions of the magnetic field lines. 3

28. (a) (i) What property do acids and bases have in common ? Explain it with an example.
(ii) A compound which is prepared from gypsum has the property of hardening when mixed with water.
Identify the compound and write its formula. How is this compound prepared ? Describe it in the form of a chemical equation only. 3

OR

- (b) (i) Write the chemical name and Molecular formula of tooth enamel.
(ii) How does it get corroded ? What is the preventive measure for this ? 3
29. (a) Write the percentage of (i) solar energy captured by the autotrophs and (ii) energy transferred from autotrophs to the next level in a food chain.
(b) What are trophic levels ? Why do different food chains in an ecosystem not have more than four to five trophic levels ? Give reason. 3
30. Explain the process of transport of oxygenated and deoxygenated blood in a human body. 3



31. A person is unable to see clearly a poster fixed on a distant wall. He however sees it clearly when standing at a distance of about 2 m from the wall.

- (a) Draw ray diagram to show the formation of image by his eye lens when he is far away from the wall.
- (b) List two possible reasons of this defect of vision.
- (c) Draw ray diagram to show the correction of this defect using appropriate lens.

3

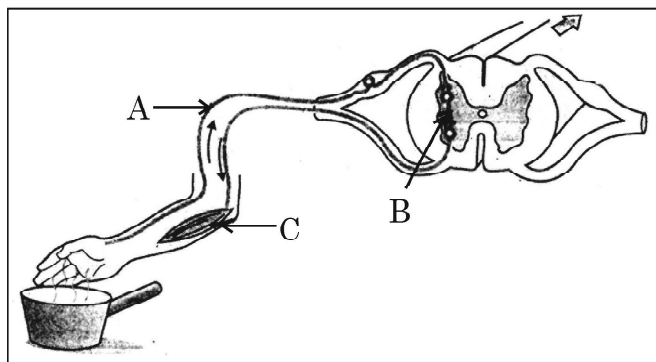
32. (a) Name the gland and the hormone secreted by it in scary situations in human beings. List any two responses shown by our body when this hormone is secreted into the blood.

3

OR

- (b) In the given diagram
 - (i) Name the parts labelled A, B, and C.
 - (ii) Write the functions of A and C.
 - (iii) Reflex arcs have evolved in animals ? Why ?

3



33. State the change in colour observed in each of the following cases mentioning the reason :

3

- (a) Silver chloride is exposed to sunlight.
- (b) A piece of zinc is dipped in ferrous sulphate solution.
- (c) Copper powder is strongly heated in air.



SECTION – D

Q. No. 34 to 36 are Long Answer Questions.

34. (a) (i) What is meant by resistance of a conductor ? Define its SI unit.
- (ii) List two factors on which the resistance of a rectangular conductor depends.
- (iii) How will the resistance of a wire be affected if its
- (1) length is doubled, and
- (2) radius is also doubled ?

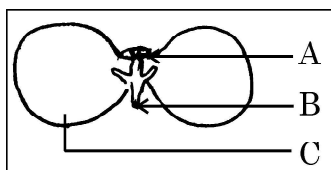
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Give justification for your answer.

OR

- (b) In an electric circuit three bulbs of 100 W each are connected in series to a source. In another circuit set of three bulbs of the same wattage are connected in parallel to the same source.
- (i) Will the bulb in the two circuits glow with the same brightness ? Justify your answer.
- (ii) Now, let one bulb in both the circuits get fused. Will the rest of the bulbs continue to glow in each circuit ? Give reason for your answer.
35. (a) Name the two types of pollination and differentiate between them.
- (b) Explain the post fertilization changes that occur in the ovary of a flower.
- (c) Given below is a diagram of a germinating seed. Label the parts that
- (i) gives rise to future shoot.
- (ii) gives rise to future root system.
- (iii) stores food.

5





36. (a) (i) A compound 'A' with a molecular formula of $C_2H_4O_2$ reacts with a base to give salt and water. Identify 'A', state its nature and the name of the functional group it possesses. Write chemical equation for the reaction involved.
- (ii) When the above stated compound 'A' reacts with another compound 'B' having molecular formula C_2H_6O in the presence of an acid, a sweet smelling compound 'C' is formed.
- (1) Identify 'B' and 'C'.
- (2) State the role of acid in this reaction.
- (3) Write chemical equation for the reaction involved. 5

OR

- (b) (i) Name the compound formed when ethanol is heated at 443 K in the presence of conc. H_2SO_4 and draw its electron dot structure. State the role of conc. H_2SO_4 in this reaction.
- (ii) What is hydrogenation ? Explain it with the help of a chemical equation. State the role of this reaction in industry. 5

SECTION – E

Q. No. 37 to 39 are case based / data based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

37. A student took three concave mirrors of different focal lengths and performed the experiment to see the image formation by placing an object at different distances with these mirrors as shown in the following table. 4

Case No.	Object-distance	Focal length
I	45 cm	20 cm
II	30 cm	15 cm
III	20 cm	30 cm

Now answer the following questions :



- (a) List two properties of the image formed in Case I.
- (b) In which one of the cases given in the table, the mirror will form real image of same size and why ?
- (c) Name the type of mirror used by dentists. Give reason why do they use such type of mirrors.

OR

- (c) Look at the table and identify the situation (object distance and focal length) which resembles the situation in which concave mirrors are used as shaving mirrors ? Draw a ray diagram to show the image formation in this case.

38. All human chromosomes are not paired. Most human chromosomes have a maternal and a paternal copy, and we have 22 such pairs. But one pair called the sex chromosomes, is odd in not always being a perfect pair. Women have a perfect pair of sex chromosomes. But men have a mismatched pair in which one is normal sized while the other is a short one.

4

- (a) In humans, how many chromosomes are present in a Zygote and in each gamete ?
- (b) A few reptiles rely entirely on environmental cues for sex determination. Comment.
- (c) “The sex of a child is a matter of chance and none of the parents are considered to be responsible for it”. Justify it through flow chart only.

OR

- (c) Why do all the gametes formed in human females have an Xchromosome ?



39. On the basis of reactivity metals are grouped into three categories –

4

- (i) Metals of low reactivity
- (ii) Metals of medium reactivity
- (iii) Metals of high reactivity

Therefore metals are extracted in pure form from their ores on the basis of their chemical properties.

Metals of high reactivity are extracted from their ores by electrolysis of the molten ore.

Metals of low reactivity are extracted from their sulphide ores, which are converted into their oxides. The oxides of these metals are reduced to metals by simple heating.

- (a) Name the process of reduction used for a metal that gives vigorous reaction with air and water both.
- (b) Carbon cannot be used as a reducing agent to obtain aluminium from its oxide ? Why ?
- (c) Describe briefly the method to obtain mercury from cinnabar. Write the chemical equation for the reactions involved in the process.

OR

- (c) Differentiate between roasting and calcination giving chemical equation for each.

