

Series : GF6HE



SET ~ 1



प्रश्न-पत्र कोड
Q.P. Code **31/6/1**

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.

नोट	NOTE
(I) कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 31 हैं।	(I) Please check that this question paper contains 31 printed pages.
(II) कृपया जाँच कर लें कि इस प्रश्न-पत्र में 39 प्रश्न हैं।	(II) Please check that this question paper contains 39 questions.
(III) प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को परीक्षार्थी उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें।	(III) 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.
(IV) कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर-पुस्तिका में यथा स्थान पर प्रश्न का क्रमांक अवश्य लिखें।	(IV) Please write down the serial number of the question in the answer-book at the given place 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 परीक्षार्थी 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 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

General Instructions :

Read the following instructions very carefully and strictly follow them :

- (i) *This question paper comprises of **39** questions. All questions are compulsory.*
- (ii) *This Question paper is divided into **five** sections – **A, B, C, D** and **E**.*
- (iii) ***Section A** - Question Nos. **1** to **20** are Multiple Choice Questions. Each question carries **1** mark.*
- (iv) ***Section B** - Question Nos. **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** - Question Nos. **27** to **33** are Short Answer (SA) type questions. Each question carries **3** marks. Answer to these questions should be in the range of **50** to **80** words.*
- (vi) ***Section D** - Question Nos. **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** - Question Nos. **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.*

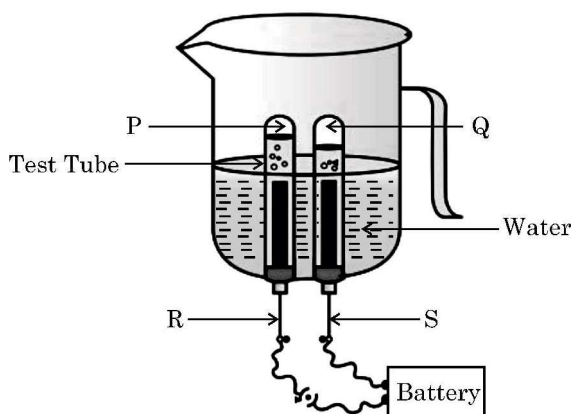
SECTION – A

In this section, Question Nos. 1 to 20 are Multiple-Choice Questions.

All questions are compulsory.

1. In the following experimental setup of electrolysis of water, if P and Q are the gases collected in the test tubes enclosing the electrodes R and S, then select the option/options in which the matching is correct :

1



- (i) P – Oxygen gas , R – Anode
 (ii) P – Hydrogen gas , R – Cathode
 (iii) Q – Hydrogen gas , S – Cathode
 (iv) Q – Oxygen gas , S – Anode
- (A) (i) and (ii) (B) (iii) and (iv)
 (C) (i) and (iii) (D) (ii) and (iv)
2. You have three aqueous solutions A, B and C as given below :
- A - Potassium nitrate
 B - Ammonium chloride
 C - Sodium carbonate
- The ascending order of the pH of these solutions is :
- (A) $A < B < C$ (B) $B < C < A$
 (C) $C < A < B$ (D) $B < A < C$
3. Select from the following a statement which is not true about burning of magnesium ribbon in air :
- (A) It burns with a dazzling white flame.
 (B) A white powder is formed on burning.
 (C) It is an endothermic reaction.
 (D) It is an example of a combination reaction.

1

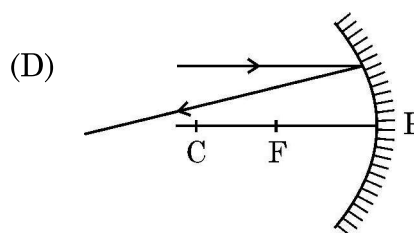
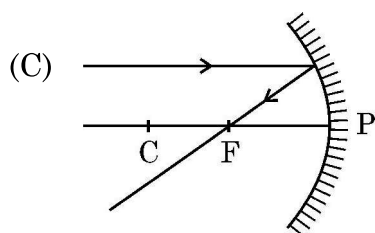
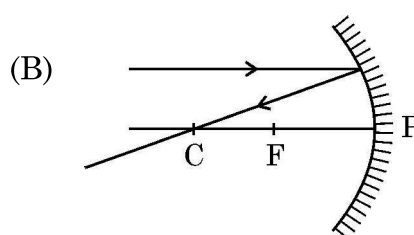
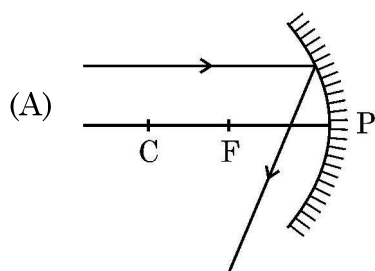
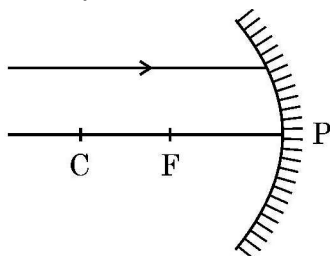
4. A Hydrocarbon which **does not** belong to the same homologous series of carbon compounds is 1
- (A) C_4H_{10} (B) C_6H_{14}
(C) C_7H_{14} (D) $C_{10}H_{22}$
5. The colour of the solution observed after about 1 hour of placing iron nails in copper sulphate solution is 1
- (A) Blue (B) Pale green
(C) Yellow (D) Reddish brown
6. Juice of tamarind turns blue litmus to red. It is because of the presence of a chemical compound called 1
- (A) Acetic acid (B) Methanoic acid
(C) Oxalic acid (D) Tartaric acid
7. The water of crystallization is present in 1
- (i) Bleaching Powder (ii) Plaster of Paris
(iii) Washing Soda (iv) Baking Soda
(A) (ii) and (iv) (B) (ii) and (iii)
(C) (i) and (iii) (D) (i) and (iv)
8. A tall pea plant with round seeds (TTRR) is crossed with a short pea plant with wrinkled seeds (ttrr). The F_1 generation will be 1
- (A) 25% tall with round seeds (B) 50% tall with wrinkled seeds
(C) 75% tall with wrinkled seeds (D) 100% tall with round seeds
9. A pair of endocrine glands located in the human brain is 1
- (A) Parathyroid and Pituitary
(B) Pineal and Thymus
(C) Hypothalamus and Thymus
(D) Hypothalamus and Pineal

10. Select the option having correct matching of the organism given in Column I with the mode of reproduction in Column II : 1

Column I		Column II	
P	Leishmania	1.	Regeneration
Q	Spirogyra	2.	Multiple Fission
R	Planaria	3.	Binary Fission
S	Plasmodium	4.	Fragmentation
		5.	Budding

- (A) P-4, Q-2, R-1, S-3
(B) P-3, Q-4, R-5, S-2
(C) P-3, Q-4, R-1, S-2
(D) P-4, Q-3, R-2, S-1
11. The basic filtration unit of the excretory system in human beings is : 1
- (A) Nephron (B) Urethra
(C) Neuron (D) Urinary bladder
12. In human alimentary canal, the digestive juice secreted by the gastric glands are 1
- (A) Bile, Trypsin, Pepsin
(B) Hydrochloric acid, Pepsin, Mucus
(C) Lipase, Bile, Mucus
(D) Salivary amylase, Pepsin, Bile

13. Identify from the following the ray diagram which shows the correct path of the reflected ray for the ray incident on a concave mirror as shown : 1



14. The part of human eye which controls the amount of light entering into it. 1

- (A) Iris (B) Cornea
(C) Ciliary muscles (D) Pupil

15. Consider the following food chain :

Grass → Grasshopper → Frog → Snake → Eagle 1

If the amount of energy available at third trophic level is 50 kJ, the available energy at the producer level was :

- (A) 0.5 kJ (B) 5 kJ
(C) 500 kJ (D) 5000 kJ

16. The **incorrect** statement about ozone is 1

- (A) It is a deadly poisonous gas.
(B) It shields the surface of the earth from UV radiation from sun.
(C) It is used as a refrigerant and in fire-extinguishers.
(D) It is formed by combining oxygen molecule with free oxygen atom.

Q. Nos. 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 and 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) :** Carbon and its compounds are our major sources of fuels. 1
Reason (R) : Most of the carbon compounds on burning release a large amount of heat and light.

18. **Assertion (A) :** Xylem tissue moves water and minerals obtained from the soil by the roots. 1
Reason (R) : Xylem tissue is found only in the roots of a plant.

19. **Assertion (A) :** In the common domestic circuits the earth wire is connected to a metallic plate buried deep inside the earth. 1
Reason (R) : Earth wire ensures that any leakage of current to the metallic body of the appliance keeps its potential to that of the earth, so the user may not get a severe electric shock.

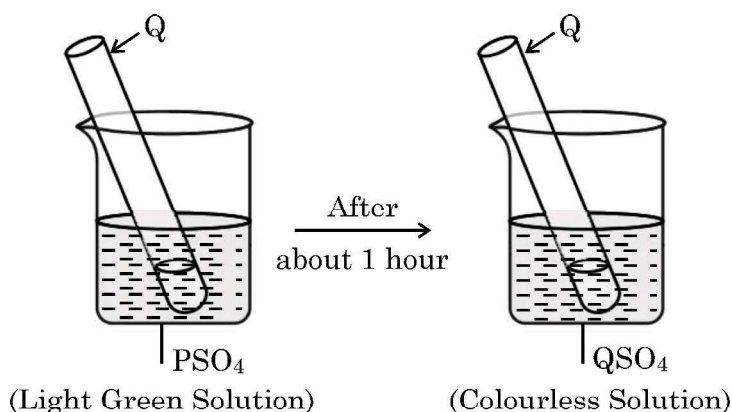
20. **Assertion (A) :** Food web is a network of several food chains operating in an ecosystem. 1
Reason (R) : Food web decreases the stability of an ecosystem.

SECTION – B

Question Nos. 21 to 26 are very short answer type questions. Each question carries 2 marks.

21. A light green coloured solution of sulphate salt of metal 'P' is taken in a beaker, a rod of another metal "Q" is put in this solution as shown the following figures :

2



Identify the metals 'P' and 'Q' and write its chemical equation for the reaction that occurs. State the conclusion of this reaction in terms of reactivity series of metals.

22. (a) How is brain protected in our body ?
(b) A doctor finds in one of his patients that he is not maintaining a proper posture and balance of his body. State the region of brain and also the part of brain which is responsible for it.
23. (a) "Proteins control the expression of various characters." Explain this statement by taking an example of "tallness" as a characteristic in plants.

2

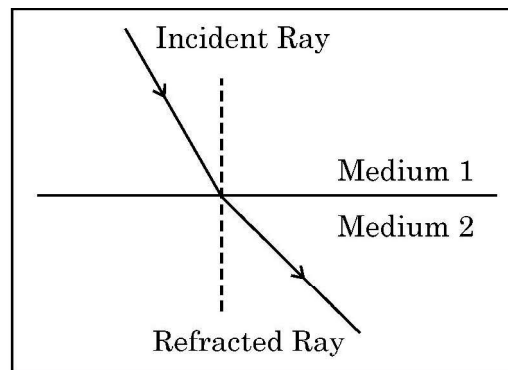
2

OR

- (b) Explain the mechanism of inheritance used by sexually reproducing organisms to ensure the stability of DNA of the species.

2

24. Study the figure in which the path of a ray of light going from Medium 1 to Medium 2 is shown.



- (a) Out of the two Media – Medium 1 and Medium 2, in which is the speed of light more ?
- (b) State reason of bending of the refracted ray away from the normal.
- (c) Express refractive index of Medium 2 with respect to Medium 1 in terms of speed of light in two media.

2

25. (a) Give reasons :

- (i) The sky appears dark to passengers flying at very high altitude.
- (ii) 'Danger' signal lights are red in colour.

2

OR

- (b) What is a rainbow ? "We see a rainbow in the sky only after the rainfall." Why ?
26. We do not clean natural ponds or lakes whereas an aquarium or a swimming pool needs to be cleaned regularly. Why ?

2

2

SECTION – C

Question Nos. 27 to 33 are short answer type questions. Each question carries 3 marks.

27. Write balanced chemical equation for the reactions that occur when
- (a) steam is passed over red hot iron.
 - (b) natural gas is burnt in air.
 - (c) glucose reacts with oxygen in the cells of our body and provides energy.
- 3**
28. (a) State the chemical property in each case on which the following uses of baking soda are based upon :
- (i) as an anti-acids
 - (ii) as a constituent in making baking powder
 - (iii) in soda-acid fire-extinguishers
- 3**

OR

- (b) Write chemical equations to show what happens when an acid reacts with a
- (i) metal
 - (ii) base and
 - (iii) carbonate
- Write the name of the main product formed in each case.
- 3**
29. Name the blood vessel that brings (i) oxygenated blood (ii) deoxygenated blood, to the human heart. Also name that chamber of the heart which receives deoxygenated blood and state how deoxygenated blood from this chamber is sent to lungs for oxygenation.
- 3**

30. The gene combination of purple flowered pea plants is denoted as (WW) and that of white flowered pea plants as (ww), when these two plants are crossed F_1 generation is obtained.

- (a) List two observations made by Mendel in F_1 generation plants.
- (b) Give the (i) percentage of white flowered plants and (ii) ratio of the gene combinations WW, Ww and ww in F_2 generation.
- (c) Write one difference between dominant and recessive trait.

3

31. A student placed a candle flame at different distances from a convex lens and focused its image on a screen. He recorded his observation in tabular form as given below :

S.No.	Distance of flame from the lens (cm)	Distance of the image from the lens
1	– 90	+ 18
2	– 60	+ 20
3	– 40	+ 24
4	– 30	+ 30
5	– 24	+ 40
6	– 20	+ 60
7	– 18	+ 90
8	– 12	+ 120

Analyse the observation table and on the basis of your analysis only, answer the following questions (without doing any calculations) :

- (a) What is the focal length of the convex lens used ? Give reason to justify your answer.
- (b) Which one of the sets of observations is not correct and why ?
- (c) Draw ray diagram to show image formation for any correct set of observation.

3

32. A person uses lenses of +2.0 D power in his spectacles for the correction of his vision.

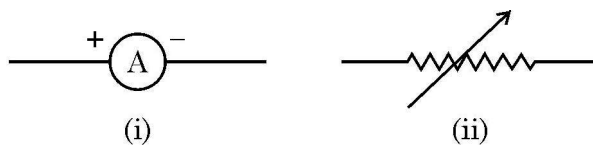
- (a) Name the defect of vision the person is suffering from.
- (b) List two causes of this defect.
- (c) Determine the focal length of the lenses used in the spectacles.

3

33. (a) Explain the statement “Potential difference between two points is 1 volt”.

- (b) What do the symbols given below represent in an electric circuit ? Write one function of each.

3



SECTION – D

Question Nos. 34 to 36 are long answer type questions. Each question carries 5 marks.

34. (a) Name an alcohol and a carboxylic acid having two carbon atoms in their structures. Draw their structures and state how this alcohol can be converted into a carboxylic acid. What happens when these two compounds react in the presence of an acid ? Write chemical equations for the reactions involved in the two cases mentioned above.

5

OR

- (b) What are soaps ? Write the structure of a soap molecule. Explain the cleansing action of a soap. Why are soaps not considered suitable for washing clothes in a region where water is hard ? How is this problem overcome ?

5

35. (a) Define Puberty. List any two changes seen in boys at the time of puberty.
- (b) Why are testes in human males located outside the abdominal cavity in scrotum ?
- (c) List any three techniques of contraception used by humans. Which one of these is not meant for males ?

5

OR

- (a) Name the part performing following functions in human female reproductive system :
- (i) production of eggs
 - (ii) site of fertilization
 - (iii) site of implantation
 - (iv) entry of the sperms
- (b) What changes are observed in the uterus :
- (i) subsequent to implantation of zygote and
 - (ii) if an egg does not get fertilized ?

5

36. (a) What are magnetic field lines ? How is the direction of magnetic field at a point determined ? Draw the pattern of magnetic field lines of the magnetic field produced by a current carrying circular loop. Mark on it the direction of (i) current and (ii) magnetic field lines.

Name the two factors on which the magnitude of the magnetic field due to a current carrying coil depends.

5

OR

- (b) Why can't two magnetic field lines cross each other ? Draw magnetic field lines showing the direction of the magnetic field due to a current carrying long straight solenoid. State the conclusion which can be drawn from the pattern of magnetic field lines inside the solenoid.

Name any two factors on which the magnitude of the magnetic field due to this solenoid depends.

5

SECTION – E

Question Nos. 37 to 39 are Case/Source based questions. Each question carries 4 marks.

37. Many pure metals like copper, iron and gold are very soft and as such are considered unsuitable for certain uses. Metallic objects around us such as cooking utensils, statues, ornaments, guns etc. are actually not made up of pure metals. Instead of pure metals, alloys are used in the design of most of the useful objects. Making alloys enhances the basic properties of a metal which is the primary constituent (metal) of an alloy.

4

- (I) How does electrical conductivity and melting point of a metal change when it is converted to its alloy by mixing a small amount of an element in it ?

1

- (II) Name an alloy used for welding two wires together in an electric circuit. Write its major constituents.

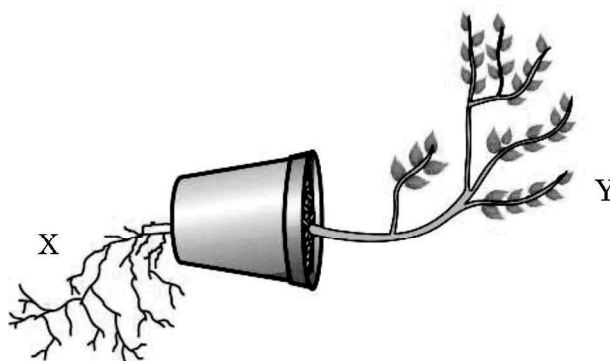
1

(III) (a) What are alloys ? How is 'Brass' (an alloy) prepared ? 2

OR

(III) (b) What is stainless steel ? How is it prepared ? Write one important property which makes it more useful in making cooking utensils as compared to its primary metal. 2

38. The growth movements of plant parts in which the direction of the stimulus determines the direction of the response is known as tropic movements or tropism. Plants also have non-directional movements which may not be growth dependent. 4



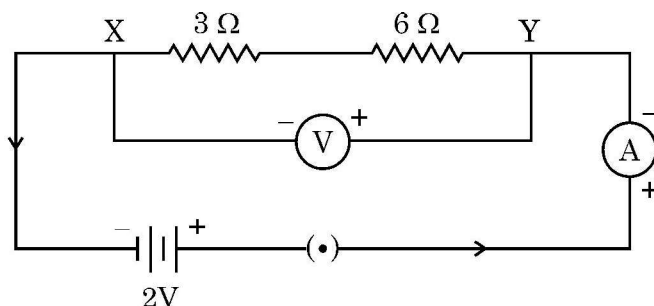
- (I) Name the movement which causes 'X' and 'Y' to grow downwards and upwards respectively. (Refer above figure) 1
- (II) Write the name of a hormone that plays a major role in (i) falling of leaves (ii) rapid cell division 1
- (III) (a) Leaves of the sensitive plant move very quickly in response to 'touch'. How is this stimulus of touch communicated and explain how the movement takes place. 2

OR

- (III) (b) Name the plant hormone which is synthesized at the shoot tip. How does this hormone helps the plant to bend towards light ? 2

39. Study the circuit shown in which two resistors X and Y of resistances $3\ \Omega$ and $6\ \Omega$ respectively are joined in series with a battery of 2 V .

4



- (I) Draw a circuit diagram showing the above two resistors X and Y joined in parallel with same battery and same ammeter and voltmeter.
- (II) In which combination of resistors will the (i) potential difference across X and Y and (ii) current through X and Y, be the same ?
- (III) (a) Find the current drawn from the battery by the series combination of the two resistors (X and Y).

1

1

2

OR

- (III) (b) Determine the equivalent resistance of the parallel combination of the two resistors (X and Y).

2