

Series DAA1B/3

Set-3

प्रश्न-पत्र कोड
Q.P. Code

31/3/3

रोल नं.

Roll No.

--	--	--	--	--	--	--	--



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 SCIENCE

निर्धारित समय : 3 घण्टे

Time allowed : 3 hours

अधिकतम अंक : 80

Maximum Marks : 80

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 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 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.

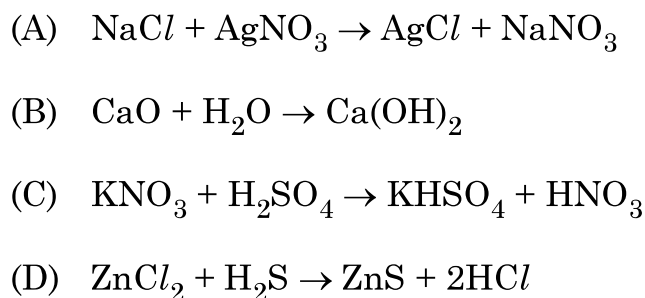
General Instructions :

Read the following instructions very carefully and strictly follow them :

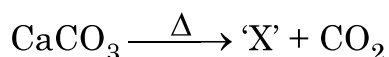
- (i) *This question paper consists of **39** questions. **All** questions are compulsory.*
- (ii) *This Question paper is divided into **five** sections – **A, B, C, D** and **E**.*
- (iii) ***Section A** - Question Nos. **1** to **20** are Multiple Choice Questions. Each question carries **1** mark.*
- (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**(20 × 1 = 20)****In this section, Question Nos. 1 to 20 are Multiple-Choice Questions.****All questions are compulsory.**

1. Which one of the following reactions is different from the remaining three ? **1**



2. Identify the product 'X' obtained in the following chemical reaction : **1**



- (A) Quick lime (B) Gypsum
(C) Lime Stone (D) Plaster of Paris

3. Select a pair of natural indicator from the following : **1**

- (A) Litmus and methyl orange
(B) Turmeric and Litmus
(C) Phenolphthalein and methyl orange
(D) Methyl orange and Turmeric

4. A chemical compound used in glass, soap and paper industries is **1**

- (A) Washing Soda (B) Baking Soda
(C) Bleaching Powder (D) Common Salt

5. क्वथन नली में लेड नाइट्रेट को गर्म करने पर प्राप्त होने वाले उत्पाद हैं -

1

- (A) PbO , N_2O और O_2 (B) NO , PbO और O_2
 (C) $\text{Pb}(\text{NO}_2)_2$ और O_2 (D) NO_2 , PbO और O_2

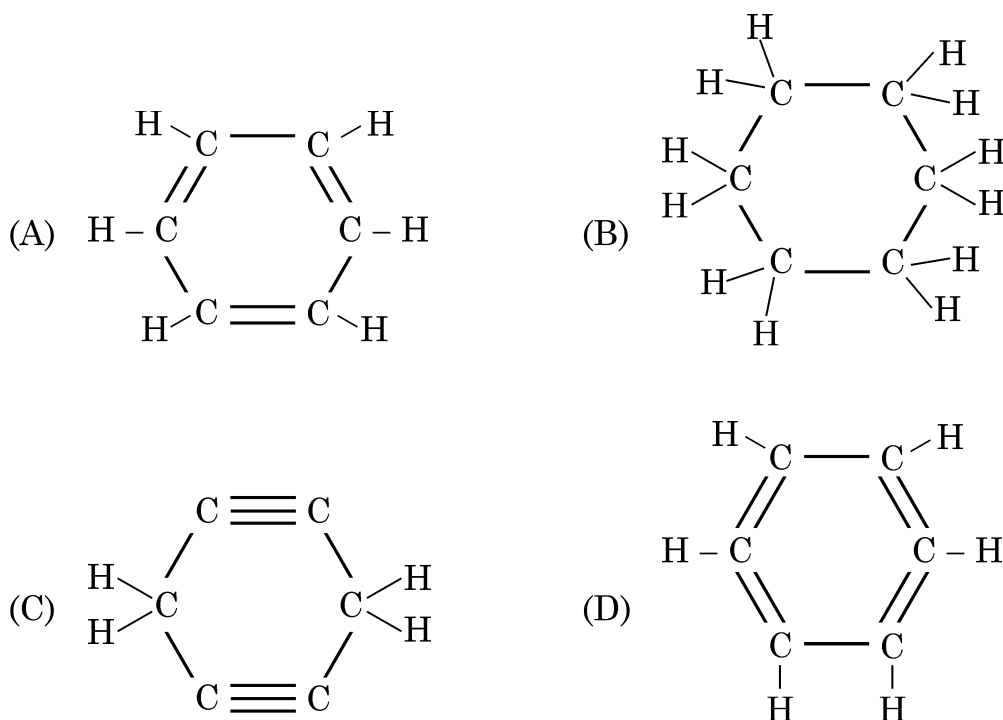
6. निम्नलिखित में से असंतृप्त हाइड्रोकार्बनों का समूह पहचानिए :

1

- (A) प्रोपेन, एथीन, ब्यूटाइन
 (B) एथीन, प्रोपेन, हैक्सेन
 (C) साइक्लोहैक्सेन, मीथेन, एथेन
 (D) ब्यूटाइन, एथीन, प्रोपाइन

7. साइक्लोहैक्सेन का संरचनात्मक सूत्र है

1



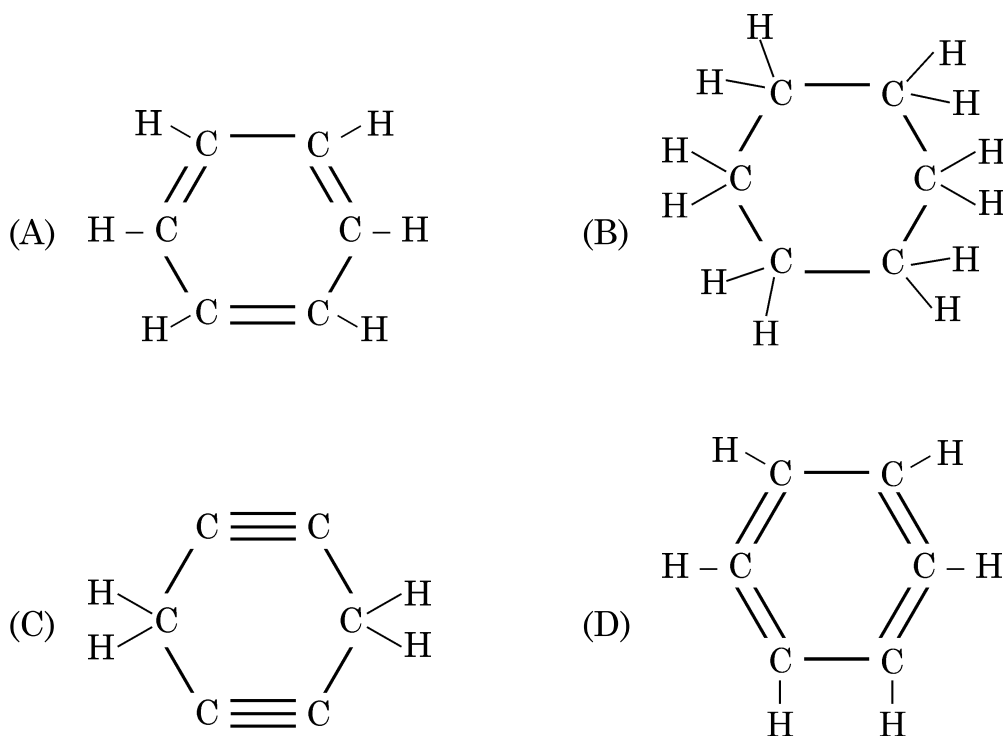
5. The products obtained when Lead nitrate is heated in a boiling tube. 1

- (A) PbO , N_2O and O_2 (B) NO , PbO and O_2
(C) $\text{Pb}(\text{NO}_2)_2$ and O_2 (D) NO_2 , PbO and O_2

6. Identify a group of the unsaturated hydrocarbons from the following : 1

- (A) Propane, Ethene, Butyne
(B) Ethene, Propane, Hexane
(C) Cyclohexane, Methane, Ethane
(D) Butyne, Ethene, Propyne

7. The structural formula of Cyclohexane is 1



8. Which of the following statement (s) is (are) true about human heart ? **1**

- (a) Right atrium receives oxygenated blood from lungs through pulmonary artery.
- (b) Left atrium transfers oxygenated blood to left ventricle which sends it to various parts of the body.
- (c) Right atrium receives deoxygenated blood from different parts of the body through vena cava.
- (d) Left atrium transfers oxygenated blood to aorta which sends it to different parts of the body.

(A) (b) only (B) (a) and (d)

(C) (b) and (c) (D) (b) and (d)

9. In an experiment to study independent inheritance of two separate traits : shape and colour of seeds, the ratio of the different combinations in F_2 progeny would be **1**

(A) 1 : 3 (B) 1 : 2 : 1

(C) 9 : 3 : 3 : 1 (D) 9 : 1 : 1 : 3

10. Select from the following a plant hormone which promotes cell division. **1**

(A) Gibberellins (B) Auxins

(C) Abscissic Acids (D) Cytokinins

11. Offsprings formed as a result of sexual reproduction produce more variations because

1

- (A) genetic material is contributed by many parents.
- (B) sexual reproduction is a lengthy process.
- (C) genetic material is contributed by two individuals of same species to produce a new generation.
- (D) DNA copying is not accompanied by the creation of cellular apparatus.

12. Sex determination depends upon the environment in

1

- (A) Birds
- (B) Amphibians
- (C) Reptiles
- (D) Fishes

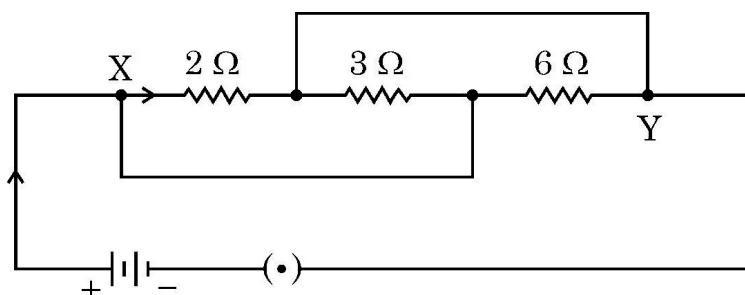
13. In case of four wires of same material, the resistance will be minimum if the diameter and length of the wire respectively are

1

- (A) $D/2$ and $L/4$
- (B) $D/4$ and $4L$
- (C) $2D$ and L
- (D) $4D$ and $2L$

14. In the given circuit the total resistance between X and Y is :

1



- (A) 12Ω
- (B) 4Ω
- (C) 6Ω
- (D) 1Ω

15. Consider the following statements about ozone :

1

- (a) Ozone is poisonous gas.
- (b) Ozone shields the earth's surface from the infrared radiation from the sun.
- (c) Ozone is a product of UV radiations acting on oxygen molecule.
- (d) At the lower level of the earth's atmosphere, ozone performs most essential function.

The correct statements are

- | | |
|-----------------|-----------------|
| (A) (a) and (b) | (B) (a) and (c) |
| (C) (b) and (c) | (D) (b) and (d) |

16. A food chain will be more advantageous in terms of energy if it has

1

- | | |
|----------------------|----------------------|
| (A) 2 trophic levels | (B) 3 trophic levels |
| (C) 4 trophic levels | (D) 5 trophic levels |

Q. 17 to 20 consists of two statements – Assertion (A) and Reason (R), answer these questions selecting the appropriate option given below :

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (B) Both (A) and (R) are true and (R) is not correct explanation of (A).
- (C) (A) is true, but (R) is false.
- (D) (A) is false, but (R) is true.

17. **Assertion (A) :** Red light signals are used to stop the vehicles on the road. **1**

Reason (R) : Red coloured light is scattered the most so as to be visible from a large distance.

18. **Assertion (A) :** A piece of Zinc metal gets reddish brown coating when kept in copper sulphate solution for some time. **1**

Reason (R) : Copper is more reactive metal than Zinc.

19. **Assertion (A) :** Offsprings produced by asexual reproduction are genetically similar to the parents. **1**

Reason (R) : Asexual reproduction involves a single parent.

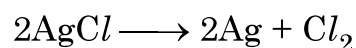
20. **Assertion (A) :** Producers are capable of using light energy from the sun to make food available in an ecosystem. **1**

Reason (R) : All food chains in an ecosystem start with a producer.

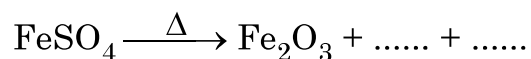
SECTION – B

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

21. (a) Write the essential conditions for following reaction to take place and name its types :



(b) Complete the following chemical reaction in the form of a balanced equation :



2

- 
22. (a) List any two pairs of visible contrasting characters of garden pea plants used by Mendel for his experiments stating the dominant and recessive characters in each pair. 2

OR

22. (b) In human beings, the probability of getting a male or a female child is 50%. Explain with the help of a flow diagram only. 2

23. Where are auxins synthesized ? How do they promote phototropism ? 2

24. (a) Draw a labelled diagram to show the pattern of magnetic field lines produced due to a current carrying straight conductor. Mark on it the direction of current in the conductor and the direction of magnetic field lines. 2

OR

24. (b) Name the device used to magnetise a piece of magnetic material. Draw a labelled diagram to show the arrangement used for the magnetisation of a cylinder made of soft iron. 2

25. When do we say that a particular person is suffering from hypermetropia ? List two causes of this defect. Name the type of lens used to correct this defect. 2

26. Give reasons for the following :

2

- (a) Food web is more stable than a food chain in an ecosystem.
- (b) A food chain should not have more than four to five trophic levels.

SECTION – C

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

27. (a) Name the chemical reaction that occurs between iron (III) oxide and aluminium metal. Write its balanced chemical equation. Why is this reaction called displacement reaction ? Give one use of this reaction.

3

OR

- (b) A student is working in a laboratory with metal 'E' which is stored under kerosene oil. Some how a small piece of this metal falls in a beaker containing water and starts burning.

3

- (i) Name the metal 'E'.
- (ii) Write chemical equation for the reaction when metal 'E' reacts with water. State the nature (acidic/basic/neutral) of the product obtained.
- (iii) Name the process by which this metal 'E' is obtained from its molten chloride.

28. State reasons for the following :

3

- (a) Zinc oxide is an amphoteric oxide.
- (b) Calcium starts floating when immersed in water.
- (c) In the reactions of nitric acid with metals, generally hydrogen gas is not evolved.



29. We water the soil but it reaches the topmost leaves of the plants. Explain in brief the process involved. 3

30. Write the name and location of a hormone which helps a person to respond when chased by a dog. Mention the responses in the body which help him to deal with the situation. 3

31. Explain in brief the function of an electric fuse in a domestic circuit. An electric heater of current rating 3 kW; 220 V is to be operated in an electric circuit of rating 5 A. What is likely to happen when the heater is switched 'ON' ? Justify your answer with necessary calculation. 3

32. Draw a schematic diagram of a circuit consisting of a battery of four dry cells of 1.5 V each, a $2\ \Omega$ resistor, a $6\ \Omega$ resistor, $16\ \Omega$ resistor and a plug key all connected in series. Put an ammeter to measure the current in the circuit and a voltmeter across the $16\ \Omega$ resistor to measure potential difference across its two ends. Use Ohm's law to determine 3

(a) ammeter reading, and

(b) voltmeter reading when key is closed.

33. Name and explain the phenomenon of light due to which the path of a beam of light becomes visible when it enters a smoke filled room through a small hole. Also state the dependence of colour of the light we receive on the size of the particle of the medium through which the beam of light passes.

3

SECTION – D

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

34. (a) (i) Draw a ray diagram to show the path of the refracted ray in each of the following cases :

A ray of light incident on a concave lens

- (1) parallel to its principal axis, and
- (2) is directed towards its principal focus.

- (ii) A 4 cm tall object is placed perpendicular to the principal axis of convex lens of focal length 24 cm. The distance of object from the lens is 16 cm. Find the position and size of image formed.

5

OR

34. (b) (i) Draw a ray diagram to show the path of the reflected ray in each of the following cases :

A ray of light incident on a convex mirror

- (1) parallel to its principal axis, and
- (2) is directed towards its principal focus

- (ii) A 1.5 cm tall candle flame is placed perpendicular to the principal axis of a concave mirror of focal length 12 cm. If the distance of the flame from the pole of the mirror is 18 cm, use mirror formula to determine the position and size of the image formed.

5

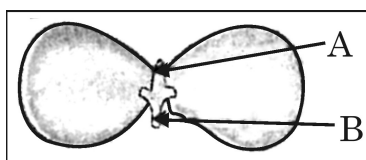
35. (a) Name any two sexually transmitted diseases.
(b) Prenatal sex determination is prohibited by law. Why ?
(c) Name any three methods of contraception stating one side-effect of each.

5

OR

35. (a) Name a unisexual and a bisexual flower.
- (b) Define cross pollination. State how it is carried out.
- (c) Observe the diagram given below and name the parts marked as 'A' and 'B'.

5



Mention the function of each of these parts.

36. (a) (i) Five solutions A, B, C, D and E when tested with pH paper showed pH as 4, 1, 13, 7 and 10 respectively. Which solution is :
- (1) Strongly acidic (2) Strongly alkaline (3) Weakly acidic
(4) Neutral and (5) Weakly alkaline ? Arrange the solutions in increasing order of H^+ ion concentration.
- (ii) Write the name and formula of (1) an acidic salt and (2) a basic salt giving the name of the parent acid and parent base used to form the salt in each case.

5

OR

36. (b) Name and state in brief the process which is used to prepare sodium hydroxide from sodium chloride. In this process along with the main product two gases 'X' and 'Y' are also given off at the two electrodes. Name 'X' and 'Y' specifying the name of their respective electrode at which each gas is obtained. One of these gases when reacts with dry calcium hydroxide produces a compound 'Z' which is widely used in water treatment plants and textile industries. Name Z and write chemical equation for the reaction involved in its formation.

5

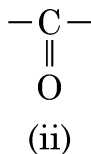
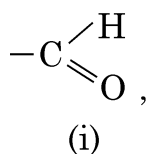
SECTION – E

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

37. More than three million carbon compounds have been discovered in the field of chemistry. The diversity of these compounds is due to the capacity of carbon atoms for bonding with one another as well as with other atoms. Most of the carbon compounds are poor conductors of electricity and have low melting and boiling points. 4

(a) Write the molecular formula of first two members of homologous series having functional group $-\text{Br}$. 1

(b) Given below are the formulae of some functional groups : 1



Write the name of these functional groups.

- (c) What would be observed on adding a 5% alkaline potassium permanganate drop by drop to some warm ethanol taken in a test tube ? State the role of KMnO_4 in the reaction and write the chemical equation for the reaction involved. 2

OR

- (c) Write the name of the compound formed when ethanol is heated at 443 K temperature with excess of conc. H_2SO_4 . What is the role of conc. H_2SO_4 in the reaction ? Write the chemical equation for the reaction involved. 2

38. Human digestive system is a tube running from mouth to anus. Its main function is to breakdown complex molecules present in the food which cannot be absorbed as such into smaller molecules. These molecules are absorbed across the walls of the tube and the absorbed food reaches each and every cell of the body where it is utilised for obtaining energy. 4

(a) Name the glands present in the buccal cavity and write the components of food on which the secretion of these glands act upon. 1

(b) Two organs have a sphincter muscle at their exit. Name them. 1

(c) What will happen if :

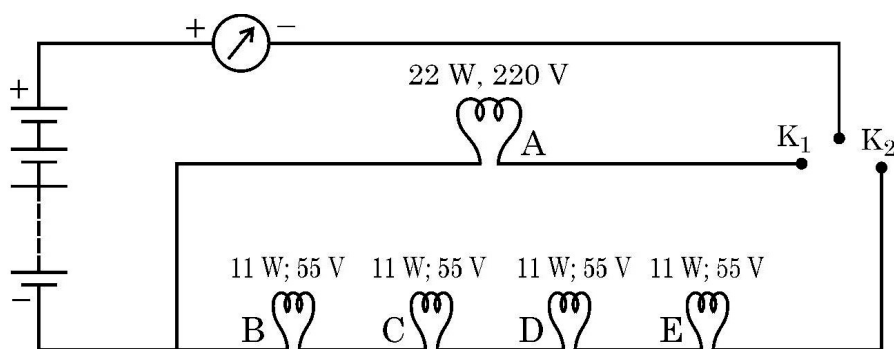
(i) mucus is not secreted by the gastric glands.

(ii) Villi are absent in the small intestine. 2

OR

(c) "Bile juice does not contain any enzyme, yet it has important roles in digestion." Justify the statement. 2

39. In a domestic circuit five LED bulbs are arranged as shown. The source voltage is 220 V and the power rating of each bulb is marked in the circuit diagram. Based on the following circuit diagram, answer the following questions : 4



(a) State what happens when 1

(i) key K_1 is closed.

(ii) key K_2 is closed.



(b) Find the current drawn by the bulb B when it glows. **1**

(c) Calculate **2**

(i) the resistance of bulb B, and

(ii) total resistance of the combination of four bulbs B, C, D and E.

OR

(c) What would happen to the glow of all the bulbs in the circuit when keys K_1 and K_2 both are closed and the bulb C suddenly get fused ?

Give reason to justify your answer. **2**

