

CBSE EXAMINATION PAPER-2025

SCIENCE

(Solved)

Time allowed : 3 hours

Maximum Marks : 57

General Instructions :

Read the following instructions carefully and follow them :

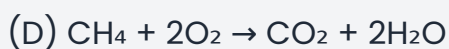
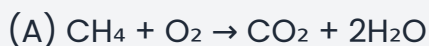
- i. This question paper contains **31 questions**. All questions are **compulsory**.
- ii. This question paper is divided into **5 sections**.
- iii. **Section A** – questions number **1 to 15** are multiple choice questions Each question carries **1 marks**.
- iv. **Section B** – questions number **16 to 21** are very short answer Each question carries **2 marks**.
- v. **Section C** – questions number **22 to 26** are short answer Each question carries **3 marks**.
- vi. **Section D** – questions number **27 to 28** are case based questions
- vii. **Section E** – questions number **29 to 31** are long answer Each question carries **5 marks**.
- viii. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.
- ix. Use of calculator is NOT allowed.

Section A

Question 1.

The correct balanced chemical equation showing exothermic reaction in which natural gas burns in air is:

[1 Marks]



Explanation: The correct answer is ' $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O} + \text{Energy}$ '. This equation accurately represents the combustion of natural gas (methane, CH_4) with oxygen (O_2) to produce carbon dioxide (CO_2) and water (H_2O), while also indicating that energy is released during the process, which is characteristic of exothermic reactions.

Question 2.

The warning sign shown in the given figure must invariably be displayed/pasted on the containers which contain hydroxide of:

[1 Marks]

(A) Sodium

(B) Calcium

(C) Magnesium

(D) Aluminium

Explanation:

The sign is used to **warn against corrosive chemicals** that can destroy living tissues or materials upon contact. **Sodium hydroxide (NaOH)** is:

- **Highly corrosive** in nature
- Can cause **severe chemical burns** to skin and eyes
- Reacts vigorously with water and organic tissues

Therefore, **containers with sodium hydroxide must display this warning symbol.**

Question 3. The body of human beings works within the pH range of:

[1 Marks]

(A) 6.1 to 6.8

(B) 6.5 to 7.3

(C) 7.5 to 8.1

(D) 7.0 to 7.8

Explanation: The correct option is 7.0 to 7.8 because the provided context states that our body functions within this pH range. Living organisms require a specific pH level to survive, and the context emphasizes that this range is crucial for human health.

Question 4. Aluminium powder is used in thermit welding because:

[1 Marks]

(A) Its reaction with iron is highly exothermic.

(B) When it is heated with iron (III) oxide, molten iron is obtained.

(C) Its melting point is low as compared to iron and a molten alloy of iron and aluminium is formed on heating which is used to join railway tracks.

(D) When it is heated with iron (III) oxide, molten aluminium oxide is obtained to join railway tracks.

Explanation: The correct option is 'When it is heated with iron (III) oxide, molten iron is obtained.' This is correct because the thermit reaction involves the reduction of iron (III) oxide (Fe_2O_3) by aluminium (Al), which produces molten iron (Fe) and aluminium oxide (Al_2O_3), along with a significant amount of heat, allowing the metal to be in a molten state for effective welding.

Question 5.

Two metals zinc and tin are dissolved separately in definite proportions in molten copper (the primary metal) to obtain two different alloys respectively known as:

[1 Marks]

(A) Brass and Solder

(B) Bronze and Brass

(C) Solder and Bronze

(D) Brass and Bronze

Explanation:

The correct answer is 'Brass and Bronze.' Brass is an alloy of copper and zinc (Cu and Zn), while bronze is an alloy of copper and tin (Cu and Sn). This is consistent with the context that explains the compositions of these alloys.

Question 6. One-cell thick blood vessels are known as:

[1 Marks]

(A) Alveoli

(B) Capillaries

(C) Veins

(D) Arteries

Explanation: The correct answer is 'Capillaries' because, according to the context, the smallest blood vessels are described as having walls that are one-cell thick. These capillaries are responsible for the exchange of materials between the blood and surrounding cells.

Question 7. Bryophyllum produces new plant through:

[1 Marks]

(A) Apical buds formed on the tip of the plant

(B) Vegetative buds produced in the notches of the leaf

(C) Fruits formed on the branches of the plant

(D) Flowers produced in the notches of the branches

Explanation: Bryophyllum produces new plants through vegetative buds that are formed in the notches along the leaf margins. When these buds fall on moist soil, they can develop into new plants, as stated in the relevant context.

Question 8. The number of chromosomes in a cell division is halved. This kind of cell division is observed in:

[1 Marks]

(A) Only testis

(B) Only ovary

(C) Ovary and testis both

(D) All cells of the body

Explanation: The correct option is 'Ovary and testis both' because meiosis is the type of cell division that reduces the chromosome number by half, producing gametes (sperm and eggs) in both the male (testis) and female (ovary) reproductive organs. This process is essential for sexual reproduction and ensures that when fertilization occurs, the resulting offspring have the correct number of chromosomes.

Question 9.

If the absolute refractive indices of two media X and Y are $\frac{6}{5}$ and $\frac{4}{3}$ respectively, then the refractive index of Y with respect to X will be:

[1 Marks]

(A) $\frac{10}{9}$

(B) $\frac{9}{8}$

(C) $\frac{8}{9}$

(D) $\frac{9}{10}$

Explanation: The refractive index of medium Y with respect to medium X can be calculated using the formula: $n(Y \text{ relative to } X) = \frac{n(Y)}{n(X)}$. Here, $n(Y) = \frac{4}{3}$ and $n(X) = \frac{6}{5}$. Thus, $n(Y \text{ relative to } X) = \frac{4/3}{6/5} = \frac{4}{3} * \frac{5}{6} = \frac{20}{18} = \frac{10}{9}$. Therefore, the correct answer is $\frac{10}{9}$.

Question 10. An object is placed at a distance of 30 cm from the pole of a concave mirror. If its real and inverted image is formed at 60 cm in front of the mirror, the focal length of the mirror is:

[1 Marks]

(A) -15 cm

(B) -20 cm

(C) +15 cm

(D) +20 cm

Explanation: To find the focal length of the concave mirror, we use the mirror formula: $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$, where $v = -60$ cm (image distance, negative for real images) and $u = -30$ cm (object distance, negative as per sign convention). Substituting the values gives $\frac{1}{(-60)} + \frac{1}{(-30)} = \frac{1}{f}$, simplifying leads to $f = -20$ cm. Thus, the focal length of the mirror is -20 cm.

Question 11.

In the given figure the angle of incidence and the angle of deviation respectively are:

[1 Marks]

(A) 1 and 6

(B) 7 and 4

(C) 7 and 6

(D) 1 and 5

Explanation: The correct answer is 1 and 6. This is because the angle of incidence ($\angle i$) is traditionally measured with respect to the normal from the refracting surface, matching to 1, while the angle of deviation ($\angle D$) corresponds to the deviation of the ray as it passes through the prism, which is represented by the value 6.

Question 12. An electric bulb is connected to a power supply of 220 V. If the current drawn by the bulb from the supply is 500 mA, the power of the bulb is:

[1 Marks]

(A) 110 W

(B) 11 W

(C) 1100 W

(D) 220 W

Explanation: The correct answer is 110 W. Using the formula $P = VI$, where $V = 220 \text{ V}$ and $I = 0.5 \text{ A}$ (500 mA), we calculate the power as $P = 220 \text{ V} \times 0.5 \text{ A} = 110 \text{ W}$.

Question 13.

Identify from the following a group containing all non-biodegradable substances:

[1 Marks]

(A) Leather, Silk, Wool

(B) DDT, Polyester, Glass

(C) Cotton, Wood, Nylon

(D) Leather, Glass, Plastic

Explanation:

The correct option is ' DDT, Polyester, Glass' because these materials are known for their persistence in the environment and do not readily decompose. The context mentions non-biodegradable substances, which are generally materials that last a long time in the environment without breaking down, adversely affecting ecosystems.

Question 14.

Assertion (A): Nichrome is an alloy which is commonly used in electrical heating devices such as electric irons, toasters, etc.

Reason (R): The resistivity of nichrome is high and its resistance decreases with increase in temperature.

[1 Marks]

(A) Assertion (A) is false, but Reason (R) is true.

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(C) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(D) Assertion (A) is true, but Reason (R) is false.

Explanation: Assertion (A) is true because nichrome is indeed widely used in electrical heating devices due to its high resistivity, which allows it to convert electrical energy into heat efficiently. However, Reason (R) is false because while nichrome has high resistivity, its resistance actually increases with an increase in temperature, contrary to what is stated. Thus, the correct response is that Assertion (A) is true, but Reason (R) is false.

Question 15.

Assertion (A): Animals will not get energy if they eat (consume) coal as food.

Reason (R): Specific enzymes are needed for the breakdown of a particular food.

[1 Marks]

(A) Assertion (A) is false, but Reason (R) is true.

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(C) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(D) Assertion (A) is true, but Reason (R) is false.

Explanation: Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). Animals cannot derive energy from coal because specific enzymes required for breaking down organic food substances are absent, which supports the fact that coal cannot be digested and absorbed for energy.

Section B

Question 16. Name the parts of hind-brain of the human brain. Which part of the hind-brain controls involuntary actions such as blood pressure and salivation?

[2 Marks]

Answer: The hind-brain consists of three main parts: the medulla oblongata, pons, and cerebellum. The medulla oblongata is the part of the hind-brain that controls involuntary actions such as blood pressure, salivation, and vomiting. It plays a crucial role in regulating essential autonomic functions necessary for survival.

Question 17.

Write one function each of the following, in a seed:

- (i) Seed coat
- (ii) Cotyledon
- (iii) Radicle
- (iv) Plumule

[2 Marks]

Answer: The seed coat serves as a protective outer layer that safeguards the embryo from physical damage and pathogens. The cotyledon acts as the initial source of nutrients for the young plant during germination. The radicle, which is the embryonic root, is responsible for anchoring the plant and absorbing water and nutrients from the soil. Lastly, the plumule is the embryonic shoot that eventually develops into the stem and leaves of the plant.

Question 18.

Out of the two lenses, one concave and the other convex, state which one will diverge a parallel beam of light falling on it. Draw a ray diagram to show the principal focus of the lens.

[2 Marks]

Answer: The concave lens diverges a parallel beam of light that falls on it. When parallel rays pass through a concave lens, they appear to diverge from a point on the same side of the lens, known as the principal focus. The rays do not actually converge; instead, they spread apart after refraction. A ray diagram would illustrate parallel rays entering the lens and diverging from the principal focus on the same side.

Question 19. An electric kettle is rated 750 W; 220 V. Can this kettle be used in a circuit which has a fuse of current rating 3 A? Give reason for your answer.

[2 Marks]

Answer: To determine if the electric kettle can be used in a 3 A circuit, we first calculate the current it draws. Using the formula $P = VI$, we find $I = P/V$, which gives $I = 750 \text{ W} / 220 \text{ V} = 3.41 \text{ A}$. Since 3.41 A exceeds the 3 A fuse rating, using the kettle could lead to fuse blowout. Thus, the kettle cannot be safely used in this circuit.

Question 20.

Write the main steps to culture yeast in the laboratory.

[2 Marks]

Answer: To culture yeast, first dissolve about 10 grams of sugar in 100 mL of water. Then, take 20 mL of this sugar solution in a test tube and add a pinch of yeast granules. Seal the test tube with a cotton plug to allow gas exchange and keep it in a warm place. After 1 to 2 hours, take a small drop of the yeast culture from the test tube, place it on a slide, and cover it with a coverslip for observation under a microscope.

Question 21.

A ray of light after refraction from a convex lens emerges parallel to its principal axis.

(i) Draw a labelled ray diagram to show it.

(ii) In this case, the incident ray before refraction from the lens passes through a point on its principal axis. Name the point.

[2 Marks]

Answer:

(i) A ray of light passing through the principal focus of a convex lens is refracted by the lens such that it emerges parallel to the principal axis. The ray diagram shows the incident ray coming from the left, passing through the focal point (F) of the convex lens before striking the lens, and then refracting to travel parallel to the principal axis on the other side.

(ii) The point through which the incident ray passes before entering the convex lens is called the **principal focus** of the lens.

Section C

Question 22.

Write the electron-dot structures of (i) sodium, and (ii) oxygen. Using these structures, show the formation of sodium oxide. Mark the anion and cation present in this compound.

(At. No. – Sodium = 11 and Oxygen = 8)

[3 Marks]

Answer: Sodium (Na) has an atomic number of 11, so it has 1 electron in its outermost shell. The electron-dot structure for sodium is represented as $\text{Na}\cdot$. Oxygen (O), with an atomic number of 8, has 6 electrons in its outer shell, shown as $\cdot\cdot\text{O}\cdot\cdot$. When sodium reacts with oxygen, sodium donates its one electron to oxygen, forming Na^+ (the cation) and O^{2-} (the anion). The resulting compound is sodium oxide (Na_2O), where two sodium ions combine with one oxide ion to achieve stability.

Question 23.

(a) Define hormone.

(b) "Hormones should be secreted in precise quantities. We have a feedback mechanism through which this is done." With the help of an example justify the statement.

[3 Marks]

Answer: A hormone is a chemical messenger produced by glands in the endocrine system, which travels through the bloodstream to target distant organs for regulation of various physiological processes. Hormones must be secreted in precise quantities for optimal functioning; this is managed by feedback mechanisms. For instance, when blood sugar levels rise, pancreatic cells detect this increase and secrete insulin, helping to lower blood sugar levels. As blood sugar falls, insulin secretion decreases, demonstrating the negative feedback loop that maintains homeostasis.

Question 24.

The lowest part of the ear called earlobe, is closely attached to the side of the head in some of us (Figure 'X'), and not in others, called free earlobe (Figure 'Y'). Attached and free earlobes are two variants found in human populations. The gene for free earlobe is dominant over attached earlobes.

(a) A man with attached earlobes marries a woman having free earlobes. 50% of their children have free earlobes and 50% have attached earlobes. Explain the inheritance of this trait and write the trait combinations of the progeny.

(b) Write the gene combinations of the father and the mother in the above case.

[3 Marks]

Answer: In this scenario, the man with attached earlobes has the genotype 'aa' (homozygous recessive) while the woman with free earlobes has the genotype 'Aa' (heterozygous). The gene for free earlobes (A) is dominant over attached earlobes (a). When they have children, there are two possible allele combinations from the parents: 'Aa' (free earlobes) and 'aa' (attached earlobes). Since there is a 50% chance for each, the offspring will have a 50% ratio of free to attached earlobes.

Question 25. A convex lens forms an 8.0 cm long image of a 2.0 cm long object which is kept at a distance of 6.0 cm from the optical center of the lens. If the object and image are on the same side of the lens, find (i) the nature of the image, (ii) the position of the image, and (iii) the focal length of the lens.

[3 Marks]

Answer: The nature of the image formed by the convex lens in this case is virtual and erect since the object distance is less than the focal length of the lens. For a convex lens, if the object is within the focal length, the image will form on the same side as the object. The position of the image can be calculated using the lens formula $1/f = 1/v - 1/u$. Given $u = -6$ cm, we find that $v = -12$ cm. Therefore, the image is virtual and located at 12 cm from the lens. To find the focal length, we use $1/f = 1/v + 1/u$, which yields $f = 4$ cm.

Question 26. Write the essential function performed by ozone at the higher levels of the atmosphere. How is it formed in the upper atmosphere? Write the name of the group of chemicals mainly responsible for the depletion of the ozone layer.

[3 Marks]

Answer: The essential function of ozone in the upper atmosphere is to protect the Earth from harmful ultraviolet (UV) radiation emitted by the Sun. This UV radiation can cause serious health issues such as skin cancer and cataracts, as well as harming various organisms and ecosystems. Ozone is formed in the upper atmosphere through a process where UV light splits oxygen molecules (O_2) into individual oxygen atoms (O). These free oxygen atoms then react with other oxygen molecules to form ozone (O_3). The main

group of chemicals responsible for the depletion of the ozone layer are chlorofluorocarbons (CFCs), which are used in industrial applications such as refrigeration, aerosol sprays, and foam production. CFCs break down ozone molecules and significantly reduce the ozone concentration in the atmosphere.

Section D

Question 27. When a girl is born, the ovaries already contain thousands of immature eggs. On reaching puberty, some of these start maturing. One matured egg is released every month by one of the ovaries. The two oviducts unite into an elastic bag-like structure known as the uterus.

(1) How does the uterus prepare itself to receive and nurture the growing embryo?

Explain.

[1 Marks]

Answer: The uterus prepares itself for the arrival of a growing embryo through a series of physiological changes that occur monthly during the menstrual cycle. After puberty, with the release of a matured egg from the ovary, the uterine lining begins to thicken in a process called endometrial proliferation. This thickening is predominantly due to the increase in hormones, primarily estrogen and progesterone. The prepared uterine lining becomes nutritious and enriched with blood vessels to provide the necessary environment for implantation. If the egg is fertilized by sperm and successfully implants in the uterine wall, the changes support the embryo's growth, allowing it to receive nutrients and oxygen essential for development. If fertilization does not occur, the thickened lining is shed during menstruation.

Key Points: 1. Release of matured egg from the ovary. 2. Thickening of uterine lining (endometrium) due to hormones. 3. Preparation of a nutritious environment for embryo implantation and growth.

(2) Write the site of fertilization in human female.

[1 Marks]

Answer: In the human female reproductive system, fertilization typically occurs in the oviducts, also known as fallopian tubes. After ovulation, a matured egg is released from the ovary and travels through the oviduct, where it can meet the sperm that has entered through the vagina. If a sperm penetrates the egg, fertilization occurs inside

the oviduct, which ultimately leads to the formation of a zygote that will later implant in the uterus for further development.

Key Points: Oviducts are the site of fertilization - Matured egg is released from the ovary - Sperm enters through the vagina - Fertilization occurs when sperm meets the egg in the oviduct

(3) What happens when the egg is not fertilized?

[2 Marks]

Answer: When the egg is not fertilized, it undergoes a process called menstruation. After being released from the ovary, if the egg does not meet a sperm for fertilization, it does not implant in the uterus. As a result, the thickened lining of the uterus, which was prepared to receive a fertilized egg, sheds, leading to menstrual bleeding. This cycle typically occurs every 28 to 30 days and marks the beginning of a new menstrual cycle. The immature eggs in the ovaries remain until they begin to mature in subsequent cycles.

Key Points: egg release- menstruation- thickened uterine lining sheds

(4)

How does the developing embryo get nutrition from the mother's blood ? Explain.

[2 Marks]

Answer: The developing embryo receives nutrition from the mother's blood through a specialized structure called the placenta. The placenta forms after implantation of the embryo in the uterine lining. It facilitates the exchange of nutrients, oxygen, and waste between the mother and the embryo. The mother's blood vessels supply essential nutrients and oxygen to the placenta, which then transports these vital substances to the embryo. Additionally, the placenta also assists in the removal of waste products from the embryo's blood back into the mother's bloodstream. This efficient exchange system is crucial for the proper growth and development of the embryo.

Key Points: placenta formation-nutrient exchange-mother's blood vessels

Question 28.

A person allowed a narrow beam of white light from the sun to enter a dark room through a small aperture and placed a glass prism in its path in such a manner that the beam falls on the face AB of the prism as shown in the figure.

A screen S is placed on the other side of the prism, facing AC. On turning the prism slowly, a beautiful band of colours is obtained on the screen. It is the spectrum of sunlight.

(1) State the reason for getting a band of seven colours in the above case.

[1 Marks]

Answer: The band of seven colours is obtained because white sunlight is made up of seven different colours. When white light passes through the glass prism, it bends or refracts. Different colours bend by different amounts due to their different wavelengths. This causes white light to separate into its seven constituent colours, forming a spectrum on the screen.

Key Points: White light consists of seven colours–Different colours have different wavelengths–Different amounts of bending (refraction) occurs–Due to dispersion, white light splits into seven colours–spectrum is formed on the screen

(2) Name the phenomenon due to which a prism splits the incident white light into a band of colours.

[1 Marks]

Answer: The phenomenon is called dispersion.

Key Points: Prism splits white light–White light is made of many colours–Different colours bend differently–This splitting of light into colours is called dispersion

(3) Explain with the help of a labelled ray diagram, an experimental arrangement to show the recombination of the spectrum of white light.

[2 Marks]

Answer: Take two identical glass prisms and arrange them such that the spectrum formed by the first prism is allowed to pass through the second prism kept inverted (in

the opposite orientation). First, allow a narrow beam of white sunlight to pass through the first prism, which disperses it into seven colours forming a spectrum on a screen. Then, place the second prism in the path of this spectrum but in the inverted position. When the spectrum passes through the second prism, the colours recombine to form white light again on the screen. This shows that the spectrum can be recombined to get the original white light. (Labelled ray diagram should show sunlight entering the first prism, spectrum formation, second prism in inverted position, and white light recombining on the screen.)

Key Points: Use of two identical prisms – First prism disperses white light into spectrum – Second prism inverted to recombine spectrum – Spectrum converts back into white light – Labelled ray diagram showing light path through both prisms

(4)

Draw a labelled ray diagram to show the formation of a rainbow.

[2 Marks]

Answer: A labelled ray diagram shows a triangular glass prism with a narrow beam of white sunlight entering one face of the prism (face AB). The white light refracts on entering the prism and disperses into seven colours inside the prism due to different refractive indices of the colours. The emerging rays exit from the opposite face (face AC) and fall on a screen where a spectrum is formed, displaying the seven colours of the rainbow in order: violet, indigo, blue, green, yellow, orange, and red.

Key Points: Labelled prism with faces AB and AC–White light entering the prism– Refraction and dispersion of light inside the prism– Emergence of seven colours forming a spectrum–Screen placed to observe the spectrum

Section E

Question 29.

(i) "The length of the small intestine in various animals depends on the food they eat." Justify the statement.

(ii) Discuss the role of the pancreas and bile juice in the digestion of food in human beings.

(iii) How is the small intestine designed to absorb digested food ?

[5 Marks]

Answer: The length of the small intestine in animals varies, adapting to their diet.

Herbivores, like cows, consume fibrous plant material. Their longer small intestines allow for extended digestion and fermentation of cellulose, which is challenging to break down. In contrast, carnivores, such as tigers, eat meat that is easier to digest, resulting in shorter small intestines due to less required transit time.

The pancreas plays a crucial role in digestion by secreting enzymes like lipase for fats and trypsin for proteins, while bile, produced by the liver and stored in the gallbladder, aids in the emulsification of fats.

Finally, the small intestine's design includes villi and microvilli that increase the surface area, enhancing nutrient absorption. This specialized structure ensures effective uptake of amino acids, sugars, and fatty acids, which are vital for the body's metabolism.

Question 30.

(i) State the role of rings of cartilage present in the throat.

(ii) Discuss the role of the ribs and diaphragm when air is taken in during the breathing cycle.

(iii) Why do we get muscle cramps during heavy exercise ? Explain.

[5 Marks]

Answer: The rings of cartilage in the throat, also known as tracheal rings, play a crucial role in maintaining the structure of the airway. They prevent the trachea from collapsing, thereby ensuring that air can freely flow to and from the lungs. During inhalation, the ribs and diaphragm work together to facilitate breathing; when the diaphragm contracts, it moves downward, and the ribs elevate, expanding the chest cavity. This creates a negative pressure that draws air into the lungs. Muscle cramps during heavy exercise occur due to an imbalance of electrolytes and dehydration, resulting in involuntary muscle contractions. High-intensity activity depletes energy stores and leads to the accumulation of lactic acid, which can trigger cramps. Proper hydration and stretching are key to preventing such cramps.

Question 31.

(i) Define the term solenoid. Draw the pattern of the magnetic field lines in and around a current carrying straight solenoid. Mark on the pattern the (i) direction of current, (ii) direction of field lines near the ends of the solenoid, and (iii) region where the magnetic field is uniform.

(ii) How would you make an electromagnet using a current carrying solenoid ?

[5 Marks]

Answer: A solenoid is a coil consisting of many circular turns of insulated copper wire, tightly wound in a cylindrical shape. When electric current is passed through it, it creates a magnetic field similar to that of a bar magnet, with one end acting as a north pole and the other as a south pole. The magnetic field lines inside the solenoid are parallel and equidistant, indicating a uniform magnetic field. To create an electromagnet, insert a soft iron rod inside the solenoid. When current flows, the rod becomes magnetized, turning it into a magnet, which can be switched on and off by controlling the electric current.

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