Roll No. _____ NLCS/10/Science (086)/95

Pre Board Exam 2025 – 2026

Time Allowed : 3 : 00 Hrs. **M M : 80**

General Instructions: (i) This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.

(ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

Section A (Biology)

Q.1 The process of breaking down of organic matter by microorganism is called 1
A. Photosynthesis B. Respiration C. Decomposition D. Fermentation

Q.2 Dead organic matter- earthworm- bird - hawk is a type of which food chain : 1
A. Grazing food chain B. Detritus food chain C. Food web D. Trophic level

Q.3 The plant hormone promoting rapid cell division in seeds and wilting of leaves respectively are -1
A. Auxin and abscisic acid B. Cytokinin and abscisic acid
C. Gibberlin and auxin D. Abscisic acid and Gibberlin

Q.4 The process of release of egg from ovary is called - 1
A. Mensuration B. Reproduction C. Insemination D. Ovulation

Q.5 In aerobic respiration ,the steps are breakdown of glucose to pyruvate and its further conversion to carbon dioxide. Both process respect occurs in - 1
A. Vacuoles and cytoplasm B. Chloroplast and mitochondria
C. Mitochondria and cytoplasm D. Vacuoles and mitochondria

Q.6 The major cause of depletion of ozone layer is 1
A. Release of oxygen B. Release of carbon dioxide C. Release of CFC D.UV rays

Q.7 The examples of artificial and natural ecosystems are 1
A. Forest and pond B. Gardens and forest
C. lakes and gardens D. Forest and crop fields

Note: The question No. 8 & 9 consists of two statements – Assertion (A) and Reason (R). Answer these questions by 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 the correct explanation of A.

C. A is true but R is false.

D. A is false but R is true.

Q.8 **Assertion (A)** : Cerebellum controls the coordination of body movements and posture. 1
Reason (R): Medula oblangata control and regulate the centre for coughing and sneezing .

Q.9 **Assertion (A)** : Greater number of individuals are present in lower trophic levels 1
Reason (R) : The flow of energy is always uni directional

Q.10 What would be the consequences of deficiency of haemoglobin in our bodies ? 2

Q.11 How the sex or gender is determine in human beings? Explain by making cross . 2

OR

Make a monohybrid cross by taking an example of colour of flower also write the phenotypic and genotypic ratio

Q.12 Give reason for the following - 2
The male reproductive organ responsible for the formation of germ cell is located outside the abdominal cavity.

Q.13 (A)Differentiate between gamete and zygote . 1+2=3
(B)write the four post fertilization changes in flower

Q.14



(A) Identify and Explain the role of X,Y,Z in the above diagram 1½

(B) How artificial kidney different from the natural kidney explain 1½

Q.15 The growing size of human population is a cause of concern for all people. The rate of birth and death in a given population will determine its size. Reproduction is the process by which organism increases their population. The process of sexual maturation for reproduction is gradual and take place while general body growth is still going on. Some degree of sexual maturation does not necessarily mean that the mind or body is ready for sexual act or for having and bringing up childrens .Various contraceptive devices are being used by human beings to control the size of population.

A. List two common sign of sexual maturation in boys and girls . 1

B. What is the result of female foeticide? 1

C. Which contraceptive method changes the hormonal balance of the body .Give an example of it

OR

C. Write the two factors that determine the size of population 2

Q.16 (A) Why Mendel selected pea plant for his experiment on inheritance. (Write Four Points) 2

(B) List all Mendelian characters with their dominant and recessive characters. (with Symbols) 3

OR

(A) How is the equal genetic contribution of male and female parents ensured in the progeny 1

(B) List two difference between- 4

1.Dominant and recessive traits.2.Monohybrid and dihybrid cross.

SECTION – B (Chemistry)

Q.17 Calcium oxide reacts vigorously with water to produce slaked lime. 1

$CaO_{(s)} + H_2O_{(l)} \rightarrow Ca(OH)_{2(aq)}$ This reaction can be classified as:

(i) Combination reaction (ii) Exothermic reaction.

(iii) Endothermic reaction (iv) Oxidation reaction

Which of the following is a correct option?

(A) (i) and (iii) (B) (i), (iii) and (iv) (C) (iii) and (iv) (D) (i) and (ii)

Q.18 Four statements about the reactions of oxides with dilute hydrochloric acid and aqueous sodium hydroxide are listed. 1

I. Aluminium oxide reacts with both dilute hydrochloric acid and aqueous sodium hydroxide.

II. Calcium oxide reacts with dilute hydrochloric acid and aqueous sodium hydroxide.

III. Zinc oxide reacts with both dilute hydrochloric acid and aqueous sodium hydroxide.

IV. Sulphur dioxide does not react with either dilute hydrochloric acid or aqueous sodium hydroxide.

Which statements are correct?

(A). I and II (B). I and III (C). II and IV (D). III and IV

Q.19 Which one of the following processes involve chemical reactions? 1

(A) Storing of oxygen gas under pressure in a gas cylinder

(B) Liquefaction of air

(C) Keeping petrol in a China dish in the open

(D) Heating copper wire in presence of air at high temperature

Q.20 The following table shows the pH values of four solutions A, B, C and D on a pH scale: 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14
		D		A		B						C	

The solutions A, B, C and D respectively are of a

(A) Strong acid, weak acid, neutral, strong base

(B) Weak acid, neutral, weak base, strong base

(C) Weak acid, neutral, strong base, weak base

(D) Weak acid, neutral, strong base, strong acid

Q.21 Which of the following substances when dissolved in equal volume of water, will have the lowest pH value? 1

(A) Sulphuric acid (B) Acetic acid (C) Magnesium hydroxide (D) Sodium hydroxide

Q.22 A metal, 'X', on treatment with sodium hydroxide liberates a gas 'G'. It also liberates the same gas, 'G' on treatment with dilute sulphuric acid. Based on above information, X and 'G' respectively are 1

(A) Copper and Sulphur dioxide (B) Zinc and Sulphur dioxide

(C) Zinc and Hydrogen (D) Copper and Hydrogen

Q.23 An iron nail is added to each of the two test tubes 'P' and 'Q' containing aqueous copper (II) sulphate, and aqueous silver nitrate respectively. Which of the following observation is correct?1

(A). In test tube 'P' iron nail is coated with a blue coating and in test tube 'Q' there is no reaction.

(B) Iron nail is coated with a brown coating in test tube 'P' and silver coating in test tube 'Q'.

(C) There is no reaction in either of the test tubes 'P' or 'Q'.

(D). There is no reaction in test tube 'P' but a silver coating on iron nail is seen in test tube 'Q'.

The question No. 24 consists of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below: 1

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 the correct explanation of A.

C. A is true but R is false.

D. A is false but R is true.

Q.24 **Assertion (A)**: Carbon and its compounds are our major sources of fuels.

Reason (R): Most of the carbon compounds on burning release a large amount of heat and light.

Q.25 Identify the type of each of the following reactions stating the reason for your answers. 2

A. $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe + heat$

B. $Pb(NO_3)_2 + 2KI \rightarrow PbI_2(\downarrow) + 2KNO_3$

Q.26 (A) Anirudh took two metal oxides; aluminium oxide and magnesium oxide as shown in the pictures given below. But he forgot to label them. How will you guide/ help Anirudh to identify the oxides and label them? 1½





(B) In an activity Aishu was given two substances; Copper Sulphide (Cu_2S) and Copper Oxide (Cu_2O) to obtain copper from these compounds. She was able to extract Copper successfully. Illustrate with the help of chemical equations how Aishu might have completed the activity. 1½

Q.27 Derive the names of A, Y, Z, M, P & R 3

$$A + H_2O \xrightarrow{\text{Electrolysis}} \underset{\text{Caustic soda}}{X} + \underset{\text{anode}}{Y\uparrow} + \underset{\text{cathode}}{Z\uparrow}$$

$$\underset{\text{molten}}{A} \xrightarrow{\text{Electrolysis}} \underset{\text{cathode}}{M} + \underset{\text{anode}}{Y\uparrow}$$

$$M + CH_3COOH \longrightarrow P + Z\uparrow$$

$$CH_3COOH + Q \xrightarrow{\text{Conc. } H_2SO_4} R$$

$$R + X \longrightarrow P + Q$$

Q.28 Gourav took 2 mL of dilute NaOH solution in a test tube and added two drops of phenolphthalein solution to it. The solution turned pink in colour. he added dilute H_2SO_4 to the above solution drop by drop until the solution in the test tube became colourless. 40 drops of dilute H_2SO_4 were used for the change in colour from pink to colourless. When Gourav added a drop of NaOH to the solution, the colour changed to back to pink again. Gourav now tried the activity with different volumes of NaOH and recorded him observation in the table given below:

S.No.	Volume of dil. NaOH taken (mL)	Drops of dil. H_2SO_4 used
1	2	20
2	3	30
3	4	40

Answer the following questions based on the above information:

(A) If Gourav used concentrated H_2SO_4 in place of dilute H_2SO_4, how many drops will be required for the change in colour to be observed? 1½

(a) 40 (b) < 40 (c) >40

Justify your answer.

(B) Gourav measured 20 drops of dil. H_2SO_4 and found its volume to be 1 mL. If Gourav observed a change in colour of NaOH solution by using 3 mL of H_2SO_4, how many mL of NaOH did he add to the test tube initially?

OR

Gourav takes 10 drops of dilute H_2SO_4 in the test tube and adds two drops of phenolphthalein solution to it. Then he adds NaOH dropwise. Gourav observes a change in colour after adding 20 drops of NaOH. What change in colour would he observe and why? 1½

(C) Write a balanced chemical equation for the reaction taking place in the above experiment. 1

Q.29 Devas while doing certain reactions observed that heating of substance 'X' with vinegar like smell with a substance 'Y' (which is used as an industrial solvent) in presence of conc. Sulphuric acid on a water bath gives a sweet-smelling liquid 'Z' having molecular formula $C_4H_8O_2$. When heated with caustic soda (NaOH), 'Z' gives back the sodium salt of the compound 'Y'. Identify 'X', 'Y', and 'Z'. Illustrate the changes with the help of suitable chemical equations. 5

OR

(a) Tejas classified the reaction between Methane and Chlorine in presence of sunlight as a substitution reaction. Support Tejas's view with suitable justification and illustrate the reaction with the help of a balanced chemical equation. 2

(b) 'A' & 'B' are sodium salts of long-chain carboxylic acid and long chain Sulphonic acid respectively. Which one of A or B will you prefer as a cleansing agent while using underground water (hand pump water)? Give the reason for your answer. 3

SECTION – C (Physics)

Q.30 An object is placed at a distance of 15 cm from a concave mirror of focal length 10 cm. The image formed will be: 1

(a) Real, inverted and magnified (b) Real, inverted and diminished

(c) Virtual, erect and diminished (d) Virtual, erect and magnified

Q.31 When a ray of light passes through a glass prism It suffers two refractions. During these refractions the ray bends: 1

(a) Away from the base in both case

(b) Towards the base in both cases

(c) Towards the base in first case and away from the base in second case

(d) Away from the base in first case and towards the base in second case.

Q.32 **Assertion (A):** A concave mirror can form a real and inverted image of an object. 1

Reason (R): Real and inverted images can be formed only when reflected rays appear to meet.

(a) Both A and R are true, and R is the correct explanation of A.

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

(c) A is true, but R is false.

(d) A is false, but R is true.

Q.33 Space is mostly vacuum, devoid of any medium. 2

(a) What colour does the sun appear to the astronauts on International Space Station?

(b) Give reason for your answer to part (a)

Q.34 Two resistors of 12 Ω and 6 Ω are connected in parallel and the combination is connected to a battery of 6 V. Calculate: 2

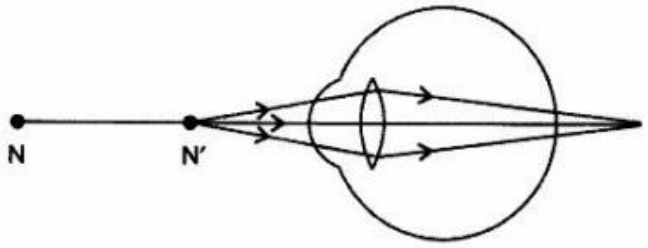
(i) The total resistance of the circuit.

(ii) The current through the circuit.

OR

Two wires of equal lengths, one of copper and the other of manganin (an alloy) have the same thickness. Which one can be used for (i) electrical transmission lines, and (ii) electrical heating devices? Why?

Q.35 Study the diagram given below and answer the question that follow it. 1×3=3



(a) Identify the defect of vision. Give reason for your answer.

(b) State two possible causes of this defect.

(c) How can we rectify this defect? Explain with a diagram.

Q.36 (a) State Ohm's law and write it's mathematical relation? 1½

(b) A household uses two bulbs of 60 W each for 5 hours a day and an electric heater of 1000 W for 2 hours daily. Calculate the total energy consumed in one day in kWh. 1½

Q.37 "A current carrying conductor put in a magnetic field experience a magnetic force" explain with an suitable activity. List the factors on which direction of this force depends? 3

Q.38 Analyse the following observation table showing variation of image-distance (v) with object-distance (u) in case of a convex lens and answer the questions that follow without doing any calculations :

S. No	Object-Distance u(cm)	Image-Distance v (cm)
1	-90	+18
2	-60	+20
3	-30	+30
4	-20	+60
5	-18	+90
6	-10	+100

(a) State the lens formula. 2

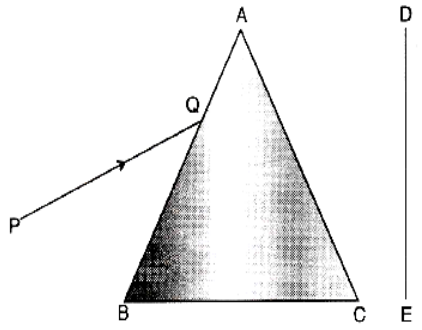
(b) Write the serial number of that observation which is not correct. How did you arrive at this conclusion? 1

(c) Take an appropriate scale to draw ray diagram for the observation at S. No. 2. 1

OR

Under what condition does a biconvex lens of glass having a certain refractive index act as a plane glass sheet when immersed in a liquid?

Q.39 A narrow beam PQ of white light is passing through a glass prism ABC as shown in the diagram.



Trace it on your answer sheet and show the path of the emergent beam as observed on the screen DE.

(i) Write the name and cause of the phenomenon observed.

(ii) Where else in nature is this phenomenon observed?

(iii) Based on this observation state the conclusion which can be drawn about the constituents of white light. 5

OR

(a) (I)What is meant by scattering of light?

(ii) State the factors on which the colour of scattered light perceived by us depends.

(b) Which of the two is scattered more easily-lighter short wavelength or light of longer wave length Give reason.

(c) How is the eye defect of old person differing from near-sightedness and far-sightedness?

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