

**INSTRUCTIONS:**

- ⇒ All questions are compulsory.
- ⇒ The question paper consists of three subjects. (Physics, Chemistry and Biology)
- ⇒ Each subject consists of 4 sections: A, B, C and D.
- ⇒ Internal choice is given in each section.
- ⇒ All questions in Section A are one-mark questions. These are to be answered in about 10 - 20 words each.
- ⇒ All questions in Section B are two-marks questions. These are to be answered in about 40 - 50 words each.
- ⇒ All questions in Section C are three-marks questions. These are to be answered in about 60 - 80 words each.
- ⇒ All questions in Section D are four-marks questions. These are to be answered in about 90 - 120 words each.
- ⇒ This question paper consists of a total of 39 questions.
- ⇒ New Section should be answered on new page and questions must be answered as per given sequence only.

**PHYSICS**

**SECTION A**

**(I) Fill in the blanks:**

1. Three resistors of  $1 \Omega$ ,  $2 \Omega$  and  $3 \Omega$  are connected in parallel. The combined resistance of the three resistors should be..... [1]
2. A wire of resistance R is divided in 10 equal parts. These parts are connected in parallel. The equivalent resistance of such a connection will be..... [1]

**(II) True/False:**

3. When we enter a dark room coming from outside, immediately the things inside the room do not appear clear to our eyes. This is because pupils take time to adjust..... [1]

**(II) MCQ :**

4. Which method is used to produce electricity in hydroelectric power plant? [1]
  - a. By boiling the water to produce steam
  - b. By ionizing water
  - c. By running dynamo by kinetic energy
  - d. Any of the above

**SECTION B**

5. What is meant by power of accommodation of eye? [2]
6. How is the strength of magnetic field near a straight current-conductor [2]
  - (i) related to the strength of current in the conductor?
  - (ii) is affected by changing the direction of flow of current in the conductor?
7. The increase in demand for energy is affecting our environment adversely. List two effects [2]

**OR**

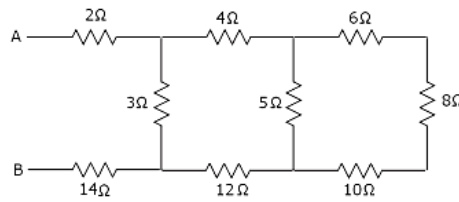
Why is there a need to harness non-conventional sources of energy? Give two main reasons.

**SECTION C**

8. It is desired to obtain an erect image of an object, using concave mirror of focal length of 12 cm. [3]
  - (i) What should be the range of the object distance in the above case?
  - (ii) Will the image be smaller or larger than the object? Draw a ray diagram to show the formation of image in this case.
  - (iii) Where will the image of this object be, if it is placed 24 cm in front of the mirror?
9. i) What is the function of earth wire in electrical instruments? [3]
  - ii) Explain what is short circuiting an electric supply.
  - iii) What is the usual current rating of the fuse wire in the line to feed?
    - (a) Lights and fans?
    - (b) Appliances of 2kW or more power?

OR

Find the resultant resistance for the given circuit.



10. What do you mean by scattering of light? Why does the sky appear dark instead of blue to an astronaut? [3]

SECTION D

11. (i) On entering in a medium from air, the speed of light becomes half of its value in air. Find the refractive index of that medium with respect to air? [4]  
 (ii) A glass slab made of a material of refractive index  $n_1$  is kept in a medium of refractive index  $n_2$ . A light ray is incident on the slab. Draw the path of the rays of light emerging from the glass slab, if  
 (A)  $n_1 > n_2$                       (B)  $n_1 = n_2$                       (C)  $n_1 < n_2$
12. (i) Consider a conductor of resistance 'R', length 'L', thickness 'd' and resistivity 'ρ'. Now this conductor is cut into four equal parts. What will be the new resistivity of each of these parts? Why? [4]  
 (ii) Find the resistance if all of these parts are connected in:  
 (a) Parallel                                      (b) Series

OR

- (i) If the current I through a resistor is increased by 100% (assume that temperature remains unchanged), the increase in power dissipated will be?  
 (ii) Two bulbs marked 200 watt-250 volts and 100 watt-250 volts are joined in series to 250 volts supply. Calculate the power consumed in circuit ?

CHEMISTRY

SECTION A

1. Fill in the blanks: [1]  
 Most metal oxides are \_\_\_\_\_ in nature whereas non-metals are \_\_\_\_\_ or \_\_\_\_\_.
2. On the basis of sequence of the given reactions identify the most and least reactive elements respectively: [1]  
 $X + YA \rightarrow XA + Y$  .....(i)  
 $X + YB \rightarrow XB + Y$  ..... (ii)  
 $Z + XA \rightarrow ZA + X$  ..... (iii)  
 (1) X and Z                      (2) Y and Z                      (3) Z and X                      (4) Z and Y
3. Match column I with II [1]

Sr. No.	Column I	Sr. No.	Column II
A	$_{20}\text{Ca}$	P	3 <sup>rd</sup>
B	$_8\text{O}$	Q	1 <sup>st</sup>
C	$_{17}\text{Cl}$	R	2 <sup>nd</sup>
D	$_{15}\text{P}$	S	4 <sup>th</sup>

- (1) A- S, B-P, C-S, D-Q                      (2) A-S, B-R, C-P, D-Q  
 (3) A-S, B-Q, C-P, D-R                      (4) A-R, B-S, C-P, D-Q
4. State the given statement true or false. [1]  
 The carbon atoms in graphite have a different number of neutrons from those in diamond.

5. State the Dobereiner's law with appropriate example. [1]

**SECTION B**

6. Give reason: [2]

- Silver articles turn black and copper vessels turn green after sometime.
- Ammonia is a base but it does not contain hydroxyl group.

7. At ordinary temperature the surface of metals such as magnesium, aluminum, zinc etc. is covered with a thin layer. What is the composition of this layer? State its importance. [2]

8. Write the chemical name of the following compounds. [2]

- $\text{CH}_3\text{-CH=CH-CH}_3$
- $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-COOH}$

**OR**

Define pH scale. Draw a figure showing variation of pH with change in concentration of  $\text{H}^+$  (aq) and  $\text{OH}^-$  (aq) ions. Mention the pH of the acidic, basic and neutral solutions respectively.

**SECTION C**

9. An element X belongs to 3<sup>rd</sup> period and group 16 of the Modern Periodic table. [3]

- Determine the number of valence electrons and the valency of X.
- Molecular formula of the compound of X when it reacts with hydrogen and write its electron dot diagram.
- Name the element X and state whether it is metallic or non-metallic.

10. What happens when chlorine is passes over slaked lime at 313K? Write chemical equation of the reaction involved and state two uses of the product. [3]

**OR**

Explain the action of dilute hydrochloric acid on following with suitable chemical equations:

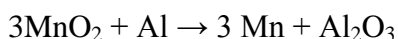
- Magnesium ribbon,
- Sodium hydroxide,
- Crushed egg shells.

**SECTION D**

11. (a) Write balanced chemical equation for the following reactions: [4]

Hydrogen sulphide burns in air to give water and sulphur dioxide.

- (b) Name the reducing agent in the following reaction:



- (c) What is rancidity? How it is prevented?

12. a. Write the steps involved in the extraction of pure metals in the middle of the activity series from their carbonate ores. [4]

- b. How is copper extracted from its sulphide ore? Explain the various steps supported by chemical equations. Draw a labelled diagram for the electrolytic refining of copper

**OR**

- (i) Write the molecular formula of benzene and draw its structure. List in tabular form how covalent compounds differ from ionic compounds.

- (ii) What happens when 5% alkaline  $\text{KMnO}_4$  solution is added drop by drop to warm ethanol taken in a test tube? State the role of alkaline  $\text{KMnO}_4$  solution in this reaction.

**BIOLOGY**

**SECTION A**

1. Digestion of following food takes place by [1]



a



b

	a	b
(1)	Lipase	Salivary Amylase
(2)	Bile juice	Pepsin
(3)	Trypsinogen	Renin
(4)	Pancreatic Amylase	Salivary amylase

2. During inhalation process diaphragm [1]  
 (1) Contract and dome shape (2) Relax & flat  
 (3) Contract and flat (4) Relax and dome shape
3. Which of the following is not example of homologous organs? [1]  
 (1) Bone of human arm & Bone of bird wing (2) Wing of bird and Wing of Butter fly  
 (3) Sweet potatoes and potatoes (4) Both (2) & (3)
4. Which of the following is terrestrial ecosystem? [1]  
 (1) A natural forest (2) A lake (3) A pond (4) An aquarium
5. What is Coliform? [1]  
 (1) Group of bacteria (2) Group of viruses  
 (3) Group of microorganisms (4) Group of diseases
6. Define term. a. Heredity b. Gene [1]
7. Direction: True or False: If false, rewrite correct sentence. [1]  
 Auxin is hormone which produces from adrenal gland.

**SECTION B**

8. What is divergent evolution? Why sexual mode of reproduction having more advantage then asexual mode of reproduction? [2]
9. Write the location and hormone of following gland. [2]  
 a. Testes b. Adrenal

**OR**

Write the function of following organ.

- a. Fallopian Tube b. Uterus c. Ureter d. Nephron

10. Define term Food chain. Why the number of trophic level in a food chain is limited? [2]
11. What is stakeholder? How the trees help to prevent the soil erosion and flood? [2]

**SECTION C**

12. A cross was carried out between a pure bred tall pea plant and a pure bred dwarf pea plant and  $F_1$  progeny was obtained. Later, the  $F_1$  progeny was selfed to obtain,  $F_2$  progeny. Answer the following questions. [3]
- i. What is the phenotype of the  $F_1$  progeny and why?
  - ii. Give the phenotype ratio of the  $F_2$  progeny.
  - iii. Why is the  $F_2$  progeny different from the  $F_1$  progeny?
13. Explain following physiology process of living organism. [3]
- (a) Breathing process
  - (b) Photosynthesis process in plant
14. Explain the different method of contraception. [3]

**OR**

How the developments of baby take place in mother womb?

**SECTION D**

15. a. Draw a diagram of the Human Brain and label on it: [4]  
Cerebellum, Cerebrum, Medulla oblongata and Pons
- b. Which part of brain controls the following function of body?
- i. Breathing rate
  - ii. Heart rate
  - iii. Body balance
  - iv. Reflex action