

Note:

- i. All questions are compulsory.
- ii. Use of calculators is not allowed.
- iii. Figures to the right indicate full marks.
- iv. Start writing each main question on new page.
- v. For each MCQ (i.e. Q. No. 1-A) evaluation would be done for first attempt only.
- vi. For each MCQ correct answer must be written along with its alphabet.

Eg.: (i) (A)....., (ii) (B), (iii) (C)

- vi. Draw scientifically correct labeled diagrams wherever necessary.

1. (A) Choose the correct alternative and rewrite the statements:**5**

i. The moon and the artificial satellites are moving only under the influence of the _____ of the earth.

- (A) escape velocity (B) gravitational field
(C) acceleration (D) centripetal force

ii. In _____ method a less reactive metal is coated on a more reactive metal by electrolysis.

- (A) alloying (B) electroplating
(C) anodization (D) f-block

iii. To prevent rusting, a layer of _____ metal is applied on iron sheets.

- (A) copper (B) aluminium
(C) iron ore (D) zinc

iv. We can see the Sun even when it is little below the horizon because of

- (A) Reflection of light (B) Refraction of light
(C) Dispersion of light (D) Absorption of light

v. The temperature of ice can be decreased below 0°C by mixing _____ in it.

- (A) saw dust (B) sand (C) salt (D) coal

(B) Solve the following questions :

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- i) In which block of the modern periodic table are the nonmetals found?
- ii. Write chemical equation for the following event.
Zinc oxide is dissolved in dilute hydrochloric acid.
- iii. Name the electronic configuration and atomic number of Aluminum.
- iv. Write structural formulae of methanol.
- v. Name the oxide that forms salt and water by reacting with both acid and base.

2. (A) Give Scientific reasons:

(any two)

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- (i) It is recommended to use air tight container for storing oil for long time.
- (ii) The value of g is zero at the centre of the earth..
- (iii) Geostationary satellites not useful for studies of Polar Regions.

(B) Solve the following questions:

(any three)

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- i. What is a catalyst? Write any one reaction which is brought about by use of catalyst?
- ii. Write short note on Mendeleev's periodic law.
- iii. The absolute refractive index of water is 1.36. What is the velocity of light in water?
(velocity of light in vacuum 3×10^8 m/s)
- iv. Explain the role of latent heat in the change of state of a substances?
- v. Explain the term Metallurgy.

3. Solve the following questions:

(any five)

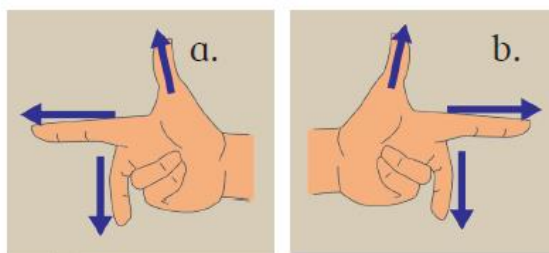
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- (i) Write the three laws given by Kepler. How did they help Newton to arrive at the inverse square law of gravity?

(ii) An element has its electron configuration as 2,8,8,2. Now answer the following questions.

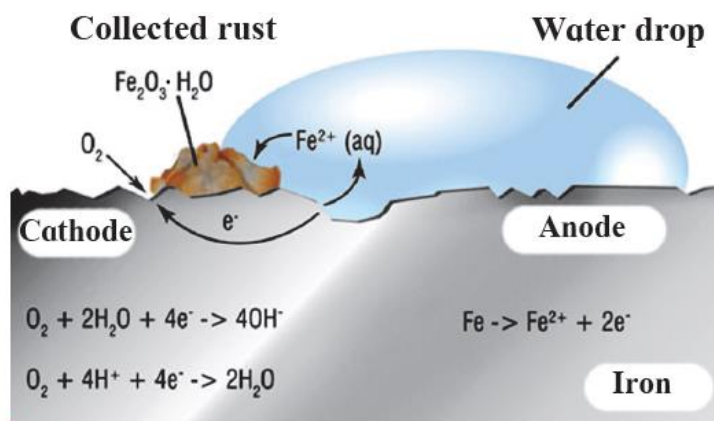
- What is the atomic number of this element?
- What is the group of this element?
- To which period does this element belong?

(iii) Name the following diagrams and explain the concept behind them.



(iv) Prove: If the angle of incidence and angle of emergence of a light ray falling on a glass slab are i and e respectively, prove that, $i = e$.

(v) Observe the following picture and write down the chemical reaction with explanation.



(vi). Read the following paragraph and answer the questions.

If heat is exchanged between a hot and cold object, the temperature of the cold object goes on increasing due to gain of energy and the temperature of the hot object goes on decreasing due to loss of energy.

The change in temperature continues till the temperatures of both the objects attain the same value. In this process, the cold object gains heat energy and the hot object loses heat energy. If the system of both the objects is isolated from the environment by keeping it inside a heat resistant box (meaning that the energy exchange takes place between the two objects only), then no energy can flow from inside the box or come into the box.

- a. Heat is transferred from where to where?
- b. Which principle do we learn about from this process?
- c. Which property of the substance is measured using this principle?

(vii) Write the IUPAC names of the following structural formulae.

- a. $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
- b. $\text{CH}_3 - \text{CH}_2 - \text{COOH}$
- c. $\text{CH}_3 - \text{CO} - \text{CH}_2 - \text{CH}_3$

(viii) What is meant by space debris? Why there is need to manage the debris.

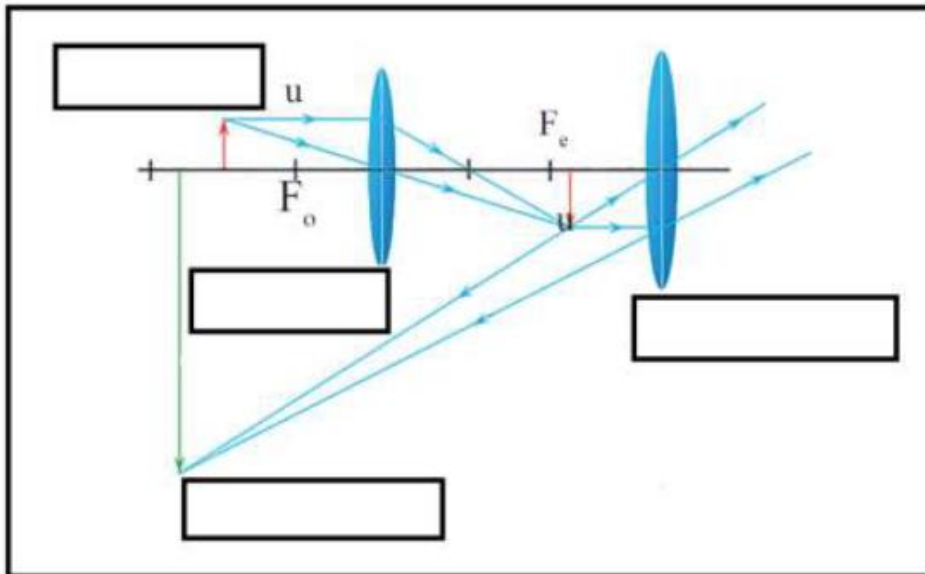
4. Solve any one of the following questions: (any one) 5

i. Study the following principle and answer the question.

A force is exerted on the current carrying conductor. The direction of this force depends on both the direction of the current and the direction of the magnetic field. This force is maximum when the direction of current is perpendicular to the direction of the magnetic field.

- a) By which law we can determine the direction of force exerted on the current carrying conductor.
- b) In which electrical equipment this principle is used.
- c) Draw a diagram representing construction of this equipment.
- d) Write the working of this equipment in brief.

ii. Observe the following figure and answer the questions:



- i. Which type of microscope has the arrangement of lenses shown in the adjoining figure?
- ii. Label the figure correctly.
- iii. Write the working of this microscope.
- iv. Where does this microscope used?
- v. Suggest a way to increase the efficiency of this microscope.

Chapter wise weightage *		
Chp No	Chapter Name	Marks
1	Gravitation	6
2	Periodic Classification of Element	6
3	Chemical reactions and equations	6
4	Effects of electric current	7
5	Heat	6
6	Refraction of light	6
7	Lenses	7
8	Metallurgy	5
9	Carbon compounds	6
10	Space Missions	5
	Total Marks	60

*Note: Complete paper is made as per reduced syllabus 2020 – 2021