Chapter #01:-

Date

Nature of chemistry in science

① → Definition of chemistry

② → Branches of chemistry

(i) Organic	(v) Biochemistry	(ix) Polymer
(ii) Inorganic	(vi) Environmental	(x) Geochemistry
(iii) Physical	(vii) Industrial	(xi) Nuclear
(iv) Analytical	(viii) Medicinal	(xii) Astrochemistry

③ → Examples of essential questions that are important for the branches of chemistry

(i) Organic	(v) Biochemistry	(ix) Polymer
	(vi) Environmental	(x) Geochemistry
(ii) Inorganic	(vii) —	(xi) Nuclear
(iii) Physical	(viii) Medicinal	(xii) Astrochemistry
(iv) Analytical		

Date

(4) → Daily life applications of chemistry

(i) organic

(ii) Inorganic

(iii) Physical

(iv) Analytical

(v) Environmental

Date

① Chemistry :-

→ Chemistry is defined as the science, that investigates

* the material of the universe and
* the changes these materials undergo.

→ Chemistry deals with the

* composition,
* structure,
* properties,
* behaviour and
* changes of matter and energy.

Interaction of chemistry with other matter and energy :-

→ Understanding the fundamental concepts of chemistry help to explain

* natural phenomena and

Date

apply them to the formation of

* new substances,
* drugs and
* technologies.

② Branches of chemistry :-

(i) Organic chemistry :-

→ It is the branch of chemistry, that deals with substances containing

* carbon,

except carbonates, bicarbonates, oxides and carbides.

Date

(ii) Inorganic chemistry:-

→ It is the branch of chemistry, that deals with

* elements and their compounds except organic compounds.

(iii) Physical chemistry:-

→ It is the branch of chemistry, that deals with

* laws and theories

to understand the structure and changes of matter.

(iv) Analytical chemistry:-

→ It is the branch of chemistry, that deals with

* the methods and instruments

Date

for determining the

* composition and propesties of matter.

(v) Biochemistry:-

→ It is the branch of chemistry, that deals with

* physical and chemical changes that occurs in living organisms.

(vi) Environmental chemistry:-

→ It is the branch of chemistry, that deals with

* the study of chemical and toxic substances that pollute the environment and

* their adverse effects on human beings.

Date

(vii) Industrial chemistry:-

→ It is the branch of chemistry, that deals with

* the large-scale production of chemical substances

(viii) Medicinal chemistry:-

→ It is the branch of chemistry, that deals with

* the study of interaction between drugs and biological targets,
* as well as the development of new medicinal agents.

(ix) Polymer chemistry:-

→ It is the branch of chemistry, that deals with

* the study of polymers, their types, properties, uses, importance and types of polymerizations.

Date

e.g:- Examples of synthetic polymers include

* nylon bearings,
* plastic bags,
* polyethylene cups,
* polyester,
* Teflon coated cookware, and
* epoxy glue etc.

(x) Geochemistry:-

→ It is the branch of chemistry, that deals with

* the study of chemical composition, distribution and transformation of elements and compounds in the earth's crust,

such as rocks, minerals, soils, water and the atmosphere.

(xi) Nuclear chemistry:-

→ It is the branch of chemistry, that deals with

* the changes that occur in atomic nuclei.

Date

(xii) Astrochemistry:-

→ It is the branch of chemistry, that deals with

* the study of chemical processes and reactions that occur in astronomical environments, such as, stars, planets, comets, and interstellar space.

(3) Examples of essential questions that are important for the branches of chemistry:-

(i) Organic chemistry:-

(1) Why carbon is considered the backbone of O.C?

(2) What are the major functional groups, in organic molecules, and how do they affect chemical properties?

Date

(ii) Inorganic chemistry :-

① What distinguishes inorganic compounds from organic compounds?

② How does periodic table helps to organise elements?

(iii) Physical chemistry :-

① What is the structure of an atom, and how it influence chemical behavior?

② How do different types of chemical bonds (ionic, covalent, metallic) form, and function?

(vi) Analytical chemistry :-

① How are analytical methods used to

* identify and
* quantify

chemical substances?

Date

(v) Biochemistry:-

(1) How do biomolecules (such as carbohydrates, proteins, nucleic acids and lipids) contribute to the structure and function of living organisms?

(vi) Environmental chemistry:-

(1) How do human activities contribute to air pollution, and what are the consequences for the environment?

(2) What role do greenhouse gases play in climate change, and how can we reduce their effects?

(vii) Medicinal chemistry:-

(1) How are drugs designed and developed for specific therapeutic purposes?

(viii) Polymer chemistry:-

(1) What are polymers, and how do their structures affect their properties?

Date

(ix) Geochemistry:-

① How do geological processes influence
* the distribution of elements in the earth's crust?

(x) Nuclear chemistry:-

① How do nuclear reactions differ from chemical reactions,
and what are their applications?

② What is the role of radioisotopes in
* medicine and industry?

(xi) Astronomy:-

① What type of reactions occur in astronomical environments?

Date

(4) Daily life applications of chemistry:-

(i) Organic chemistry:-

→ Organic chemists synthesize new medicines that interact with

* specific targets like proteins or enzymes.

(ii) Inorganic chemistry:-

→ Lithium-ion (Li-ion) batteries are used as rechargeable batteries for

* electronic toys,
* wireless headphones,
* handheld power tools,
* small and large appliances,
* electrical storage devices and
* electrical vehicals.

Date

(iii) Physical chemistry:-

→ Physical chemistry is a part of our everyday life.

→ The batteries in our vehicles are built on the principles of electrochemistry, which is a branch of physical chemistry.

(vi) Analytical chemistry:-

→ Forensic chemistry is the application of analytical chemistry.

→ It involves the examination of physical traces such as;

* body fluids,
* bones,
* fibers and
* drugs.

→ It can be used to identify unknown compounds.

e.g:- Drugs are often found in various colored powders and are analyzed to determine their content.

Date

(v) Environmental chemistry:-

→ It is used to protect water, that has been poisened by soil and dust by using different methods.

e.g:- ★ Sedimentation
★ Filtration and
★ disinfection.

Exercise # CH 01

Q # 02, (i) Not included
(ii) Done already
(iii) Not included
(iv) Done already
(v) ✓

(v) Uses of nuclear chemistry:-

① It is used in nuclear power stations

★ to generate electricity. e.g: U-235.

Date

② It is used in medical imaging.

e.g:- I-123 is used to image the brain.

③ It is used in medical diagnosis.

e.g:- I-131 is used in diagnosing

* thyroid problems.

→ Na-24 is used do detect

* blockage in blood flow.

④ It is used in therapeutic treatments.

e.g:- Co-60 is used in

* cancer treatment for radiotherapy.

Chapter Completed *1*