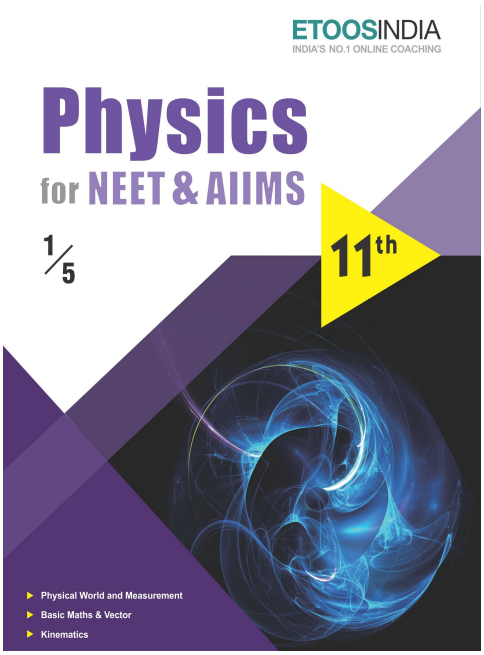
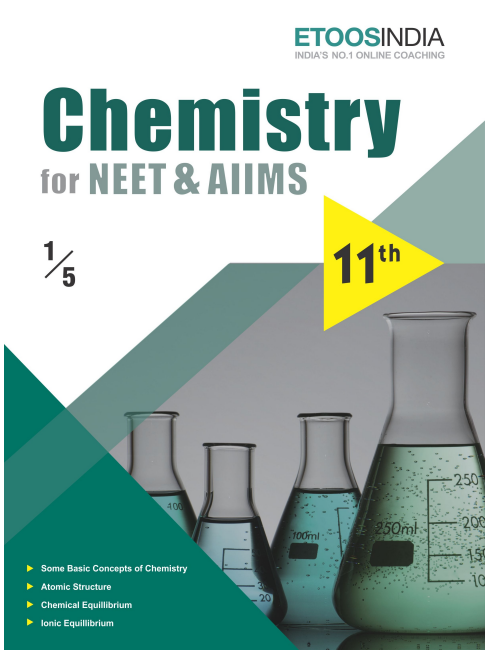
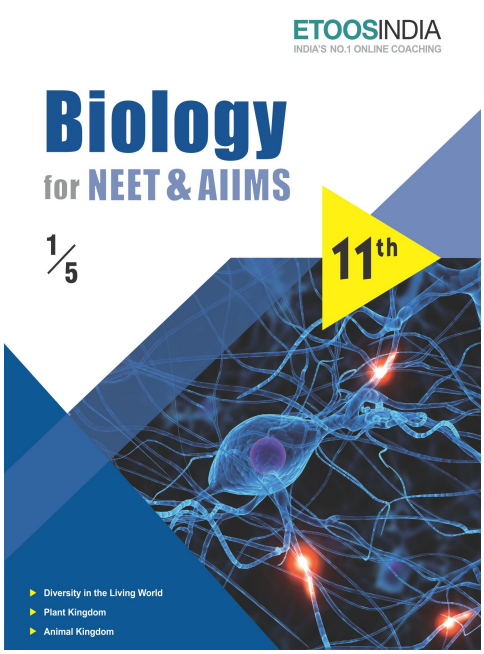
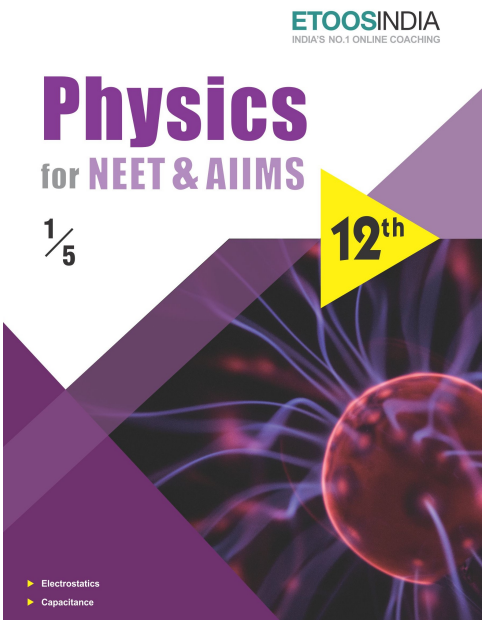
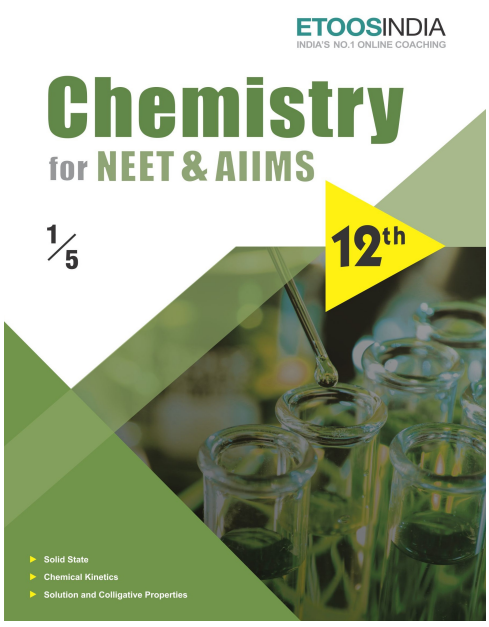
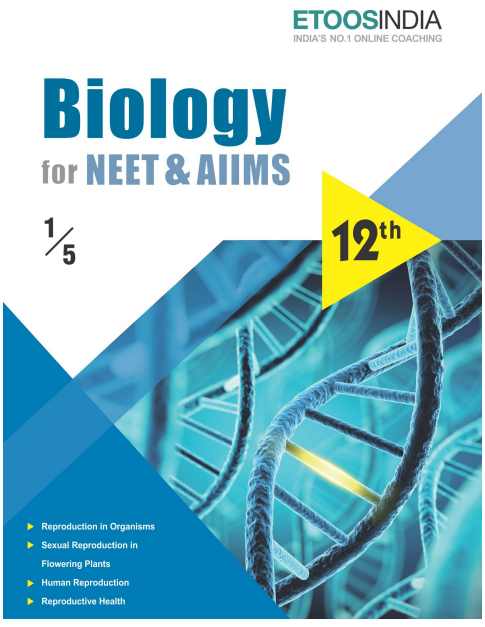












CHAPTER 15

CHEMISTRY IN EVERYDAY LIFE

Science and everyday life cannot and should not be saperated.

"ROSALIND FRANKLIN"

INTRODUCTION

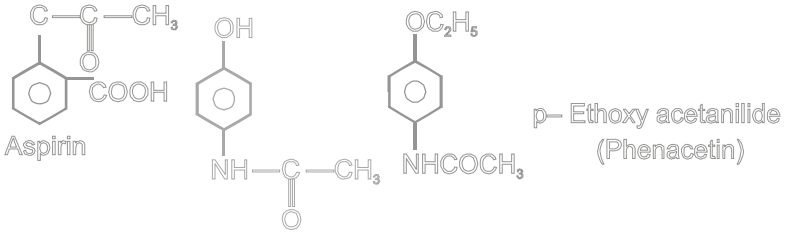
Chemistry in Everyday life helps us to have a look that where chemistry is used in our day to day life's routine. Medicines, Drugs, Chemical messangers in our body (hormones & neurotransmitters), Rocket propellants, chemicals in food, cleansing agents such as soaps & detergents, petrol the most important thing in the world in the present scenario, all types of cosmetics can be explained with the help of chemistry.

Thus advancement in chemistry helps us to synthesize & manufacture all these products economically and improve our standard of living. With the further enhancement of chemistry scientist are trying to delve into other fields as well so that further improvisation can be done.

(D) Antipyretics :

To bring down the body temp. in high fever are called antipyretics.

e.g - (a) Aspirin, (b) Analgin (Novalgin), (c) Paracetamol, (d) Phenacetin



(E) Antimalarials :

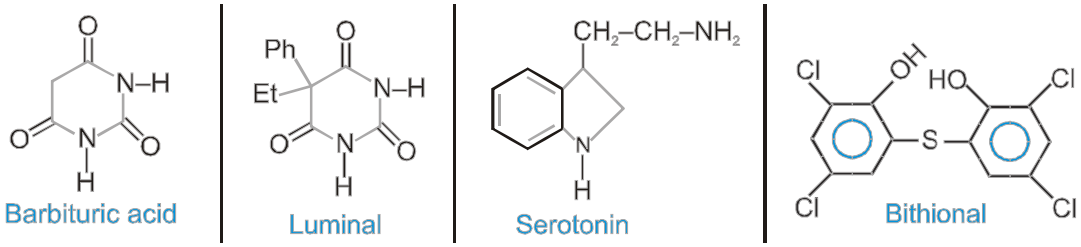
To bring down the body temperature during malarial fever.

e.g. Quinine, Chloroquine, Paraquine and Primaquine etc.

(F) Tranquilizers :

The chemical substances which acts on the central nervous system and has a calming effect.

Since these are used for mental diseases so are known as psychotherapeutic drugs.



Reserpine, an alkanoid, is a powerful tranquilizer. It is obtained from a plant, Rauwolfia serpentina (common name - Sarpagandha) which grows in India.

They are of two types - (a) Sedative or hypnotics (b) Mood elevators

(a) **Sedative** : Reduce nervous tension and promote relaxation. e.g. Reserpine, barbituric acid and its derivatives as luminal & seconal.

(b) **Mood elevators or Antidepressants :** A drug used for treatment of highly depressed patient, who has lost his confidence.

Example : Benzedrine (amphetamine)

(G) Anaesthetics :

These are chemical substances helping for producing general or local insensibility to pain and other sensation.

These are of two types (a) General (b) Local

(a) General :- Produce unconsciousness and are given at the time of major surgical operations.

Example : Gaseous form $\rightarrow$ Nitrous oxide, ethylene, cyclopropane etc.

Liquid form $\rightarrow$ Chloroform, divinyl ether and sodium pentothal etc.

Liquid dish washing detergents are non ionic type. Main problem that appears in the use of this type of detergents. is that if their hydrocarbon chain is highly branched then bacteria cannot degrade this easily, they pollute rivers and other water sources. If hydrocarbon chain is unbranched then they are decomposed by microorganism and thus no pollution occur from them.

Difference between soap and detergents

Although the action of soap and detergents is similar but there are following differences between them :

(1) Soaps are salts of weak acid and strong base whereas detergents are salts of strong acid and strong base.

(2) Aqueous solution of soap is basic where as aqueous solution of detergents is neutral.

$$R\text{–}COONa + H_2O \longrightarrow R\text{–}COOH + NaOH$$

Soap Weak acid strong base

$$ArSO_3Na + H_2O \longrightarrow ArSO_3H + NaOH$$

Detergent Strong acid strong base

(3) Woolen and silk cloths in which soft fibres are present cannot be washed with soap whereas all type of fabrics can be washed with detergents

(4) Soap cannot work in hard water because soaps are precipitated as insoluble salt by reaction with Ca^{2+} and Mg^{2+} ions. Thus more soap is used for removing dust and grease from the clothes where as detergents are not precipitated by Ca^{2+} and Mg^{2+} ions. Thus detergents can be used in hard water also.

ETOOS KEY POINTS

(i) Aspirin is used to prevent heart attacks besides being antipyretic and analgesic agents.

(ii) Soaps, detergents and phospholipids are called surfactants since they lower the surface tension of water.

(iii) Sodium soaps are hard while potassium soaps are soft. Therefore, whashing soaps are mostly sodium soaps while liquid soaps having creams and toilet soaps are potassium salts.

(iv) Unlike soaps, detergents can be used in hard water. The reson being that magnesium and calcium salts of detergents are soluble in water while those of soaps are insoluble in water.

(v) Aspirin is a non-narcotic analgesic but is toxic to liver. It also undergoes hydrolysis in the stomach producing salicyclic acid which causes bleeding from the stomach wall. Therefore, other non-narcotic analagesics such as naproxen, ibuprofen and diclofenac sodium or potassium are preferred to aspirin.

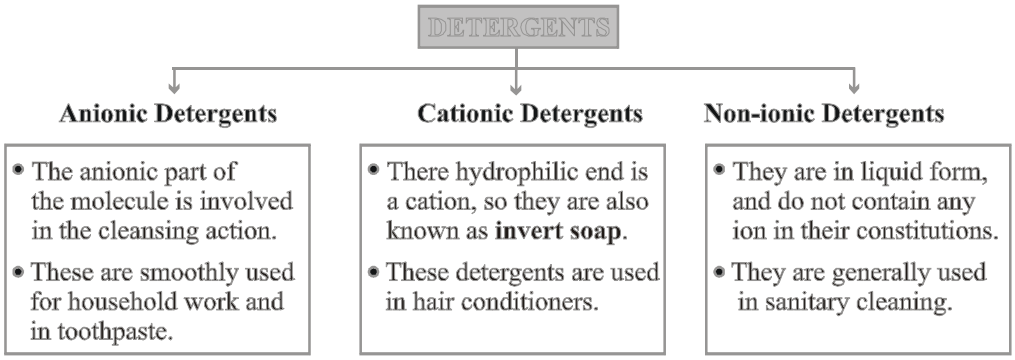
(vi) Sulpha drugs areeffective against bacterial infections.

(vii) Artificial sweetners have no caloric value and hence are useful for diabetic persons.

Etoos Tips & Formulas

1. **Drugs :** Drugs are the chemicals of low molecular masses which interact with macromolecular target and produce a biological response.

   Medicines : Medicines are the drug which are therapeutic and used for diagnosis, prevention and treatment of diseases.

2. 

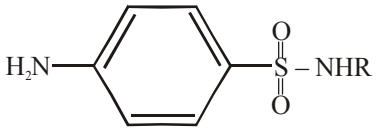
SOLVED EXAMPLE

Ex. 1 Which of the following statements is not correct ?
(A) Some antiseptics can be added to soaps
(B) Dilute solutions of some disinfectants can be used as antiseptic
(C) Disinfectants are antimicrobial drugs
(D) Antiseptic medicines can be ingested

Sol. **(D)** An antiseptic is an antimicrobal drug. It tends to destroy/ prevent development or inhibit the pathogenic action of microbes. Antiseptics are applied to the living tissues such as wounds, cuts, ulcers and diseased skin surfaces e.g., soframicine.
Bithinol the compound is also called bithional is added to soaps to impart antiseptic properties
Dilute solutions of some disinfectants can be used as antiseptic e.g., 0.2 percent solution of pehnol is an antiseptic while its one percent solution is disinfectant. But, antiseptic medicines can not be ingested like antibiotics.

Ex. 2 The most useful classification of drugs for medicinal chemists is .....
(A) On the basis of chemical structure
(B) On the basis of drug action
(C) ON the basis of molecular targets
(D) On the basis of pharmacological effect

Sol. **(C)** Drugs can be classified in the following ways
(A) on the basis of chemical structure : Drugs have been classified on the basis of their chemical structures have similar pharmacological activity. e.g., all sulphonamides having the common structural feature as given below are mostly antibacterial.



Structural feature of sulphonamide

(B) On the basis of drug action : This classification is based on the action of a drug on a particular biochemical process.
(C) On the basis of molecular target : Drugs usually interact with the biomolecules or biological macromolecules such as proteins, nucleic acids and lipids. These are called drug targets.
Drugs possessing some common structural features may have the same mechanism of action on a specific drug target. This classificationis most useful for the medicinal chemists
(D) On the basis of pharmacological effect : This classification is based upon the pharmacological effects of the drugs. It is more useful for the doctors because it provides them the whole range of drugs available for the treatment of a particular disease, e.g., analgesics reduce or kill pain while antiseptic either kill or arrest the growth of microorganisms.

Ex. 3 Compound which is added to soap to impart antiseptic properties is .....
(A) Soldium laurylsulphate
(B) Sodium dodecylbenzenesulphonate
(C) Rosin
(D) Bithional

Sol. **(D)** Basically, all soaps are made by boiling fats or oils with suitable hydroxide. Variations are made by adding different raw materials. Sodium laurylsulphate and sodium dodecylbenzenesulphonate are anionic detergents
A gum rosin added to soap to make it lather well. Bithional is added to soaps to impart antiseptic properties to soap.

Ex. 4 Glycerol is added to soap. It functions .....
(A) As a filler
(B) To increases leathering
(C) To prevent rapid drying
(D) To make soap granules

Sol. **(C)** Glycerol is added to shaving soap to prevent rapid drying while to enhance the leathering property of soap, a gum called rosin is added to them. It forms sodium rosinate which lathers well. Soap granules are dried miniature soap bubbles
Builders/ fillers make the soap act more rapidly. Builder or filter (e.g. sodium tripolyphosphate) is added to detergent powder. Its main function is to act as water softener by removing Mg^{2+} and Ca^{2+} ion from hard water by forming stable souble complexes.

Ex. 5 Photochemical smog occurs in warm, dry and sunny climate. One of the following is not amongst the components of photochemical smog, identify it
(A) NO_2
(B) O_3
(C) SO_2
(D) Unsaturated hydrocarbon

Sol. **(C)** The smog which is formed in presence of sunligh is called photochemical smog. This occurs in the moths of summer when NO_2 and hydrocarbons are presents in large amounts in atmosphere.
Concentration of O_3, PAN, aldehydes and ketones builds up in the atmosphere.
SO_2 is not responsible for photochemical smog.

Exercise # 1 SINGLE OBJECTIVE NEET LEVEL

1. An antibiotic with a broad spectrum
(A) Kills the antibodies
(B) Acts on a specific antigen
(C) Acts on different antigens
(D) Acts on both the antigens and antibodies

2. Penifillin was first discovered by
(A) A. Fleming (B) Tence and Salke
(C) S.A. Waksna (D) Lewis Pasteur

3. A medicine which promotes the secretion of unrine is called
(A) Uretic (B) Monouretic
(C) Diuretic (D) Triuretic

4. An example of a psychedilic agent is
(A) DNA (B) LSD
(C) DDT (D) TNT

5. Versonal, a barbiturate drug is used as
(A) Anaesthetic (B) Sedative
(C) Antiseptic (D) None of these

6. Acetoxy benzoic acid is
(A) Antiseptic (B) Aspirin
(C) Antibiotic (D) Mordant dye

7. Antiseptic chloroxylenol is
(A) 4-chloro-3, 50dimethylphenol
(B) 3-chloro-4, 5-dimethylphenol
(C) 4-chloro-2, 5-dimethylphenol
(D) 5-chloro-3, 4-dimethylphenol

8. Which of the following is an insecticide
(A) Bakelite (B) TNT
(C) BHC (D) Aspirin

9. Which of the following drugs is an analgesic
(A) Sulphaguanidine (B) Paludrin
(C) Analgin (D) Iodex

10. Aspirin is
(A) Antibiotic (B) Antipyretic
(C) Sedative (D) Psychedelic

11. Which of the following drugs is a tranquilizer and sedative
(A) Sulphadiazine (B) Papaverine
(C) Equanil (D) Mescaline

12. Which of the following is a hypnotic drug
(A) Luminal (B) Salol
(C) Catechol (D) Chemisol

13. An antipyretic is
(A) Quinine (B) Paracetamol
(C) Luminal (D) Piperazine

14. The drug used as an antidepressant is
(A) Luminol (B) Tofranil
(C) Mescaline (D) Sulphadiazine

15. Chloramine-T is a
(A) Disinfectant (B) Antiseptic
(C) Analgesic (D) Antipyretic

16. Streptomycin is effective in the treatment of
(A) Tuberculosis (B) Malaria
(C) Typhoid (D) Cholera

17. Which of the following is not an antiseptic drug
(A) Iodoform (B) Dettol
(C) Gammexane (D) Genatian violet

18. Which is used for sterilization of water in water supply system of cities
(A) Chlorine
(B) Sulphurdioxide
(C) Potassium permanganate
(D) DDT

19. A drug effective in the treatment of pneumonia, bronchitis, etc, is
(A) Streptomycin (B) Chloramphenicol
(C) Penicillin (D) Sulphaguanidine

20. Aspirin is obtained by the reaction of CH_3COCl with
(A) Phenol (B) Benzoic acid
(C) Salicylic acid (D) Benzaldehyde

21. Salol can be used as
(A) Antiseptic (B) Antipyretic
(C) Analgesic (D) None of these

22. The drug which is effective in curing malaria is
(A) Quinine (B) Aspirin
(C) Analgin (D) Equanil

23. Morphine is
(A) Anaesthetic (B) Analgesic
(C) Antiseptic (D) Antibiotics

24. Which of the following is a hallucinogenic drug
(A) Methedrine (B) Calmpose
(C) LSD (D) Seconal

Exercise # 2 SINGLE OBJECTIVE AIIMS LEVEL

1. Which of the following is a basic dye –
(A) Alizarin (B) Phthalein (C) Aniline yellow (D) Orange-I

2. Diazo coupling is useful to prepare some –
(A) Pesticides (B) Dyes (C) Proteins (D) Vitamins

3. Which of the following is an azo dye –
(A) Methyl orange (B) Phenolphthalein (C) Malachite green (D) Methylene blue

4. An antipyretic is –
(A) Quinine (B) Paracetamol (C) Luminal (D) Piperazine

5. Medicine which is an antibiotic is –
(A) Ampicillin (B) Aspirin (C) Chloroquine (D) None of these

6. Alizarin belongs to the class of –
(A) Vat dyes (B) Mordant dyes (C) Substantive dyes (D) Reactive dyes

7. Paracetamol is a/an –
(A) Both antipyretic and analgesic (B) Analgesic
(C) Antipyretic (D) Antimalarial

8. Which of the following compounds is aspirin –
(A) Methyl salicylate (B) Acetylsalicylic acid (C) Phenyl salicylate (D) Salicylic acid

9. Sulpha drugs are derivatives of –
(A) Benzene sulphonic acid (B) Sulphanilic acid (C) Sulphanilamide (D) p - aminobenzoic acid

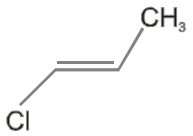
10. Which of the following is a natural dye –
(A) Phenolphthalein (B) Alizarin (C) Martius yellow (D) Malachite green

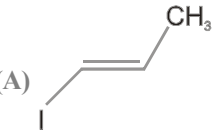
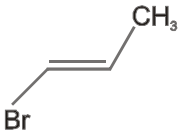
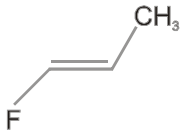
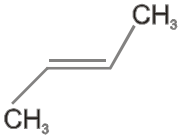
11. Octane number is zero for -
(A) Isoheptane (B) n-heptane (C) Isooctane (D) n-octane

12. Petroleum is obtained from water gas, name of the reaction involved is -
(A) Fischer-tropsch (B) Bergius (C) Dow's (D) Kjeldahl's

13. Which of the following represents a double base propellant ?
(A) Nitromethane (B) Nitrocellulose + nitroglycerine
(C) N_2O_4 + monomethylhydrazine (D) Liquid H_2 + liquid O_2

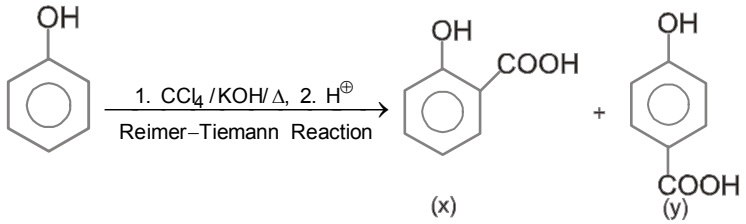
14. Which of the following represents a biliquid propellant ?
(A) Liquid N_2O_4 + unsymmetrical dimethylhydrazine (UDMH)
(B) Liquid N_2O_4 + acrylic rubber
(C) Nitroglycerine + nitrocellulose
(D) Polybutadiene + ammonium perchlorate

15. Which will have higher dipole moment than  ?

(A) 
(B) 
(C) 
(D) 

Exercise # 3 PART - 1 MATRIX MATCH COLUMN

1. Compare the properties of two isomeric products x and y formed in the following reaction.



Match the following :

Column-I	Column-II
(A) Dipole moment	**(p)** X > Y
(B) H_2O solubility	**(q)** Y = X
(C) Boiling point	**(r)** Y > X
(D) Melting point	**(s)** Can't say

Exercise # 4

PART - 1 PREVIOUS YEAR (NEET/AIPMT)

1. Green chemistry means such reactions which [CBSE AIPMT 2008]
(A) produce colour during reactions
(B) reduce the use and production of hazardous chemicals
(C) are related to the depletion of ozone layer
(D) study the reactions in plants

2. Which one of the following is employed as a tranquiliser ? [CBSE AIPMT 2009]
(A) Equanil (B) Naproxen
(C) tetracycline (D) Chloropheninamine

3. Whhich one of the following is employed as a tranquiliser drug ? [CBSE AIPMT 2010]
(A) Promethazine (B) Valium
(C) Naproxen (D) Mitepristone

4. Which one of the following is employed as antihistamine ? [CBSE AIPMT 2011]
(A) Diphenyl hydramine (B) Norethindrone
(C) Omeprazole (D) Chloroamphenicol

5. Which one of the following statements regarding photochemical smog is not correct ? [CBSE AIPMT 2012]
(A) Carbon monoxide does not play any role in photochemical smog formation
(B) Photochemical smog is an oxidising agent in character
(C) Photochemical smog is formed through photochemical reaction involving solar energy
(D) PHotochemical smog does not cause irritation in eyes and throat

6. Antiseptics and disinfectant either kill or prevent growth of microoranisms. Identify which of the following is not true. [NEET 2013]
(A) A 0.2% solution of phenol is an antiseptic while 1% solution acts as a disinfectant
(B) Chlorine and iodine are used as strong disinfectants
(C) Dilute solutions of boric acid and hydrogen, peroxide are strong antiseptics
(D) Disinfectants harm the living tissues

7. Which one of the following is not a common component of photochemical smog ? [CBSE AIPMT 2014]
(A) Ozone
(B) Acrolein
(C) Peroxyacetyl nitrate
(D) Chlorofluorocarbons

8. Bithional is generally added to the soaps as an additive to function as a/an [CBSE AIPMT 2015]
(A) softener (B) dryer
(C) buffering agent (D) antiseptic

9. Which of the following is an analgesic ? [NEET 2016, Phase I]
(A) Penicillin (B) Streptomycin
(C) Chloromycetin (D) Novalgin

10. Mixture of chloroxylenol and terpineol acts as [NEET 2017]
(A) analgesic (B) antiseptic
(C) antipyretic (D) antibiotic

11. Which of the following is a sink for CO ? [NEET 2017]
(A) Haemoglobin
(B) Microorganisms present in the soil
(C) Oceans
(D) Plants

MOCK TEST

STRAIGHT OBJECTIVE TYPE

1. Aspirin is
(A) Antibiotic (B) Antipyretic (C) Sedative (D) Psychedelic

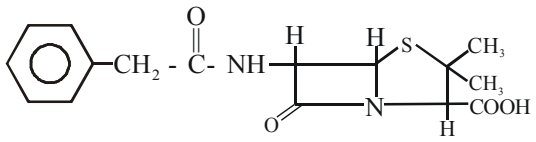
2. Which of the following drugs is a tranquilizer and sedative
(A) Sulphadiazine (B) Papaverine (C) Equanil (D) Mescaline

3. Which of the following is a hypnotic drug
(A) Luminal (B) Salol (C) Catechol (D) Chemisol

4. An antipyretic is
(A) Quinine (B) Paracetamol (C) Luminal (D) Piperazine

5. The drug used as an antidepressant is
(A) Luminol (B) Tofranil (C) Mescaline (D) Sulphadiazine

6. The structure given below is known as



(A) Penicilline F (B) Penicillin G (C) Penicillin K (D) Ampicillin
(E) Sulphadiazine

7. Aspirin is chemically
(A) Methyl salicylate (B) Ethyl salicylate (C) Acetyl salicylic acid (D) o-hydroxy benzoic acid

8. Which of the following can possibly be used as analgesic without causing addiction and any modification
(A) Morphine (B) N-acetylparaaminophenol
(C) Diazepam (D) Tetra hydrocatenol

9. Further growth of cancerous cells in the body is arrested by
(A) Physiotherapy (B) Chemotherapy (C) Electrotherapy (D) Psychotherapy

10. Which one of the following is known as broad spectrum antibiotics
(A) Streptomycine (B) Ampicillin (C) Chloramphenicol (D) Penicillin G

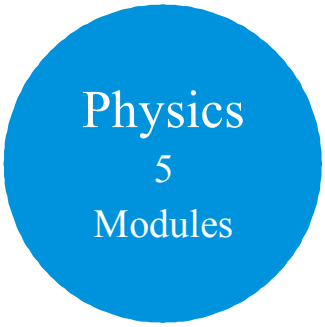
11. Which of the following is a local anaesthetic
(A) Diazepam (B) Procaine (C) Mescaline (D) None of the above

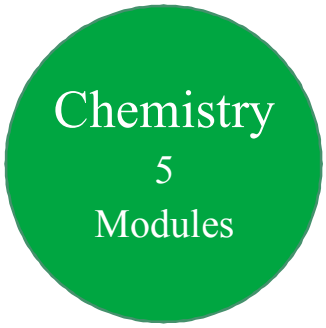
12. Which of the following is molecular disease
(A) Allergy (B) Cancer (C) German measeles (D) Sickel-cell-anaemia

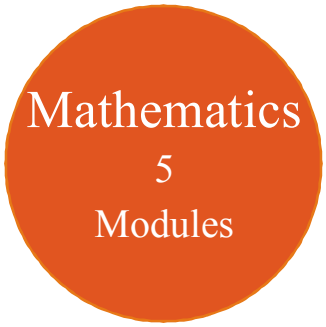
13. Which statement is false
(A) Some disinfectants can be used antiseptics at low concentration
(B) Sulphadiazine is a synthetic antibacterial
(C) Ampicillin is a natural antibiotic
(D) Aspirin is analgesic and antipyratic both

14. Tranquilisers are substances used for the treatment of
(A) Cancer (B) AIDS (C) Mental diseases (D) Physical disorders
(E) Blood infection

11th Class Modules Chapter Details

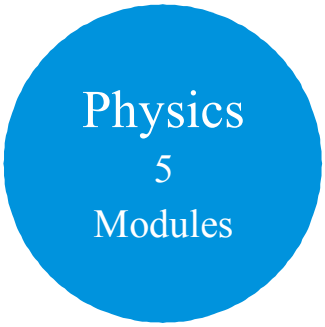


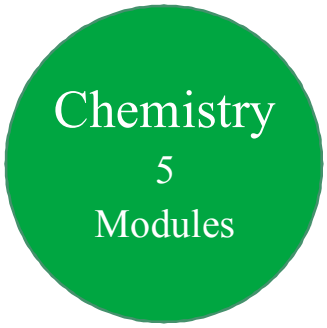


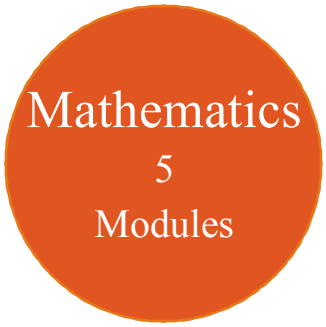


PHYSICS	CHEMISTRY	BIOLOGY
Module-1 1. Physical World & Measurements 2. Basic Maths & Vector 3. Kinematics **Module-2** 1. Law of Motion & Friction 2. Work, Energy & Power **Module-3** 1. Motion of system of particles & Rigid Body 2. Gravitation **Module-4** 1. Mechanical Properties of Matter 2. Thermal Properties of Matter **Module-5** 1. Oscillations 2. Waves	**Module-1(PC)** 1. Some Basic Conceps of Chemistry 2. Atomic Structure 3. Chemical Equilibrium 4. Ionic Equilibrium **Module-2(PC)** 1. Thermodynamics & Thermochemistry 2. Redox Reaction 3. States Of Matter (Gaseous & Liquid) **Module-3(IC)** 1. Periodic Table 2. Chemical Bonding 3. Hydrogen & Its Compounds 4. S-Block **Module-4(OC)** 1. Nomenclature of Organic Compounds 2. Isomerism 3. General Organic Chemistry **Module-5(OC)** 1. Reaction Mechanism 2. Hydrocarbon 3. Aromatic Hydrocarbon 4. Environmental Chemistry & Analysis Of Organic Compounds	**Module-1** 1. Diversity in the Living World 2. Plant Kingdom 3. Animal Kingdom **Module-2** 1. Morphology in Flowering Plants 2. Anatomy of Flowering Plants 3. Structural Organization in Animals **Module-3** 1. Cell: The Unit of Life 2. Biomolecules 3. Cell Cycle & Cell Division 4. Transport in Plants 5. Mineral Nutrition **Module-4** 1. Photosynthesis in Higher Plants 2. Respiration in Plants 3. Plant Growth and Development 4. Digestion & Absorption 5. Breathing & Exchange of Gases **Module-5** 1. Body Fluids & Its Circulation 2. Excretory Products & Their Elimination 3. Locomotion & Its Movement 4. Neural Control & Coordination 5. Chemical Coordination and Integration

12th Class Modules Chapter Details







PHYSICS

Module-1

1. Electrostatics
2. Capacitance

Module-2

1. Current Electricity
2. Magnetic Effect of Current and Magnetism

Module-3

1. Electromagnetic Induction
2. Alternating Current

Module-4

1. Geometrical Optics
2. Wave Optics

Module-5

1. Modern Physics
2. Nuclear Physics
3. Solids & Semiconductor Devices
4. Electromagnetic Waves

CHEMISTRY

Module-1(PC)

1. Solid State
2. Chemical Kinetics
3. Solutions and Colligative Properties

Module-2(PC)

1. Electrochemistry
2. Surface Chemistry

Module-3(IC)

1. P-Block Elements
2. Transition Elements (d & f block)
3. Co-ordination Compound
4. Metallurgy

Module-4(OC)

1. HaloAlkanes & HaloArenes
2. Alcohol, Phenol & Ether
3. Aldehyde, Ketone & Carboxylic Acid

Module-5(OC)

1. Nitrogen & Its Derivatives
2. Biomolecules & Polymers
3. Chemistry in Everyday Life

BIOLOGY

Module-1

1. Reproduction in Organisms
2. Sexual Reproduction in Flowering Plants
3. Human Reproduction
4. Reproductive Health

Module-2

1. Principles of Inheritance and Variation
2. Molecular Basis of Inheritance
3. Evolution

Module-3

1. Human Health and Disease
2. Strategies for Enhancement in Food Production
3. Microbes in Human Welfare

Module-4

1. Biotechnology: Principles and Processes
2. Biotechnology and Its Applications
3. Organisms and Populations

Module-5

1. Ecosystem
2. Biodiversity and Conservation
3. Environmental Issues