

## Unit-16 CHEMISTRY IN EVERYDAY LIFE

### POINTS TO BE REMEMBERED

- 1. DRUGS** – Drugs are chemical of low molecular masses, which interact with macromolecular targets and produce a biological response.
- 2. CHEMOTHERAPY**- The use of chemicals for therapeutic effect is called chemotherapy.
- 3. CLASSIFICATION OF DRUGS** –
  - (a)** ON THE BASIS OF PHARMACOLOGICAL EFFECT-drugs for a particular type of problem as analgesics-----for pain relieving.
  - (b)** ON THE BASIS OF DRUG ACTION-Action of drug on a particular biochemical process.
  - (c)** ON THE BASIS OF CHEMICAL ACTION-Drugs having similar structure .eg-sulpha drugs.
  - (d)** ON THE BASIS OF MOLECULAR TARGETS- Drugs interacting with biomolecules as lipids, proteins.
- 4. ENZYMES AS DRUG TARGETS**
  - (i)** CATALYTIC ACTION OF EN ZYMES-
    - (a)** Enzymes have active sites which hold the substrate molecule .it can be attracted by reacting molecules.
    - (b)** Substrate is bonded to active sites through hydrogen bonds, ionic bonds, Vander Waal or dipole – dipole interactions.
  - (ii)** DRUG- ENZYME INTERACTIONS-
    - (a)**Drug compete with natural substrate for their attachments on the active sites of enzymes .They are called competitive inhibitors.
    - (b)**Some drugs binds to a different site of the enzyme called allosteric sites which changes the shape of active sites.
- 5. ANTAGONISTS**- The drugs that bind to the receptor site and inhibit its natural function.
- 6. AGONISTS**-Drugs mimic the natural messenger by switching on the receptor.
- 7. ANTACIDS**-These are compounds which neutralize excess acid of stomach.eg-Aluminium hydroxide, Magnesium hydroxide.
- 8. ANTI HISTAMINES**-The drugs which interfere with the natural action of histamines and prevent the allergic reaction. eg- rantidine,tegarnet, avil.
- 9. TRANQUILIZERS**-The class of chemical compounds used for the treatment of stress,mild or even severe mental diseases. Eg- Iproniagid, luminal, seconal Equanil .
- 10. ANALGESICS**-They reduce pain without causing impairment of consciousness, mental confusion or some other disturbance of the nervous system.  
Eg - Aspirin, seridon , phenacetin.
- 11. ANTIMICROBIALS**-They tend to prevent/destroy or inhibit the pathogenic action of microbes as bacteria ,virus ,fungi etc .They are classified as

(i) **ANTIBIOTICS**-These are the chemical substances which are produced wholly or partially from micro-organisms and used for the treatment of disease caused by other micro-organism .

Eg- penicillin , ofloxacin chloramphenicol,tetracyclin etc.

**NARROW SPECTRUM ANTI-BIOTICS**-These are effective mainly against gram positive or gram negative bacteria. Eg- Penicillin , streptomycin.

**BROAD SPECTRUM ANTI-BIOTICS**-They kill or inhibit a wide range of micro-organisms.

eg- chloramphenicol , tetracycline .

(ii) **ANTISEPTICS and DISINFECTANT**-These are which either kill/inhibit the growth of micro-organisms

Antiseptics are applied to the living tissues such as wounds, cuts, ulcers etc. eg-furacine, chloroxylenol & terpinol (dettol) .Disinfectant are applied to inanimate objects such as floors , drainage system.

Eg- 0.2% solution of phenol is an antiseptic while 1% solution is a disinfectant.

**12. ANTIFERTILITY DRUGS**- These are the chemical substances used to control the pregnancy.

They are also called oral contraceptives or birth control pills.

Eg-Mifepristone, norethindrone.

**13. ARTIFICIAL SWEETNING AGENTS**-These are the chemical compounds which give sweetening effect to the food without adding calorie.

They are good for diabetic people eg- Aspartame, Saccharin, litame , Sucrolose. Aspartame being polypeptide unstable at cooking temperature hence its use is limited to cold food items ice creame etc.

**14. FOOD PRESERVATIVES**- They prevents spoilage of food caused due to microbial growth.eg- salt, sugar, and sodium benzoate.

**15. CLEANSING AGENTS**-

(i) **SOAPS**- They are sodium or potassium salts of long chain fatty acids. They are obtained by the saponification reaction, when fatty acid is heated with aqueous sodium hydroxide soap is formed.

They do not work well in hard water as they react with the soap molecules to form scum.

(iii) **TOILETS SOAP**-That are prepared by using better grade of fatty acids and excess of alkali needs to be removed .colour & perfumes are added to make them attractive.

(iv) **MEDICATED SOAPS**- Substances of medicinal value are added.eg- Buthional , dettol.

**16. SYNTHETIC DETERGENTS**-They are cleaning agents having properties of soaps, but actually contain no soap .They can used in both soft and hard water .They are three types-

(i) **ANIONIC DETERGENTS**-They are sodium salts of sulphonated long chain alcohols or hydrocarbons.eg-sodium lauryl sulphate . They are effective in acidic solution.

(sulphonation of lauryl alcohol with dil  $H_2SO_4$  and then treatment with  $NaOH$ )



(laurylalcohol)



(Sodium lauryl sulphate)

(ii) **CATIONIC DETERGENTS**- They are quaternary ammonium salts of amines with acetates , chlorides, or bromides. They are expensive used to limited extent.eg- cetyltrimethylammoniumbromide

(iii) **NON-IONIC DETERGENTS**- They does not contain any ions. Some liquid dishwashing detergents which are of non-ionic type ,they are the esters of long chain fattyacid and poly hydric alcohol.

17. **BIODEGREDALE DETERGENTS**- The detergents which are linear and can be attacked by micro-organisms are biodegradable.

Eg -sodium 4-(1-dodecyl) benzene sulphonate.

18. **NON-BIODEGREDALE DETERGENTS**- The detergents which are branched and cannot be decomposed by micro-organisms are called non-biodegradable.eg-sodium 4-(1,3,5,7 tetramethyloctyl)-benzene sulphonate .It creates water pollution.

### Gussed questions

#### VERY SHORT ANSWER TYPE QUESTION

(1 marks)

Q-1 Define the term chemotherapy?

Ans-1 Treatment of diseases using chemicals is called chemotherapy.

Q-2 why do we require artificial sweetening agents?

Ans-2 To reduce calorie intake.

Q-3 what are main constiuent of Dettol?

Ans-3 Choloroxylenol & Terpinol .

Q-4 what type drug phenaticinis?

Ans-4 It is antipyretics.

Q-5 Name the drug that are used to control allergy?

Ans-5 Antihistamines(Avil,cetirizine etc).

Q-6Why is the use of aspartame limited to cold food and drinks?

Ans-6 It is unstable at cooking temperature and decompose.

Q-7What is tranquilizers? Give an example?

Ans-7 They are the drugs used in the treatment of stress, mild and severe mental diseases.

Q-8 what type of drug chloramphenicol?

Ans-8 It is broad spectrum antibiotic.

Q-9Why is Biothional added to the toilet soap?

Ans-9 It acts as antiseptics.

Q-10 what are food preservatives?

Ans-10 The substances that prevent spoilage of food due to microbial growth. eg- sodium benzonate.

#### SHORT ANSWER TYPE QUESTION (2 marks)

Q-1 Mention one important use of the following-

(i) Equanil (ii) Sucrolose

Ans-1 (i) Equanil- It is a tranquilizer.

(ii) Sucrolose-It is an artificial sweetener.

Q-2 Define the following and give one example-

(i) Antipyretics (ii) Antibiotics

Ans-2 (i) Antipyretics- Those drugs which reduce the temperature of the body in fever are called Antipyretics.

Eg - Paracetamol

(ii) Antibiotics-The drugs which prevent the growth of other micro-organisms. Eg- Penicillin.

Q-3 Name the medicines used for the treatment of the following-

(i) Tuberculosis (ii) Typhoid Tuberculosis- Sterptomycin

Typhoid- Chloramphenicol

**Q-4 what is tincture of iodine?**

**Ans-4** 2-3% iodine solution in alcohol and water is called tincture of Iodine. It is a powerful antiseptics and is applied on wounds.

**Q- 5 What is artificial sweetening agent? Give two examples?**

**Ans-5** The substances which give sweetening to food but don't add calorie to our body .

Eg- Saccharin, alitame.

**Q-6 How is synthetic detergents better than soaps?**

**Ans- 6 (i)** Detergents can be used in hard water but soaps cannot be used.

(ii) Detergents have a stronger cleansing action than soaps.

**Q-7 what are sulpha drugs? Give two examples?**

**Ans-7** A group of drugs which are derivatives of sulphanilamide and are used in place of antibiotics is called sulpha drugs.

Eg- sulphadizine, sulphanilamide.

**Q-8 what forces are involved in holding the active sites of the enzymes?**

**Ans-8** The forces are involved in holding the active sites of the enzymes are hydrogen bonding , ionic bonding , dipole-dipole attractions or Vander waals force of attractions.

**Q-9 Describe the following giving an example in each case -**

(i)Tranquilizers

(ii) Antifertility drugs

**Ans-9**

(i) They are the medicines used in the treatment of stress, mild and severe mental diseases for ex.Equanil

(ii) Antifertility drugs- Those drugs which control the birth of the child are called antifertility drugs ex.mifepristone.

**Q-10 Give two examples of organic compounds used as antiseptics?**

**Ans-10** Phenol (0.2%), Iodoform

### SHORT ANSWER TYPE QUESTION

(3 marks)

**Q-1 what are Biodegradable and non-biodegradable detergents? Give one example of each.**

**Ans-1** Detergents having straight hydrocarbon chain and are easily decomposed by micro-organisms are called Biodegradable detergents.The detergents having branched hydrocarbon chain and are not easily decomposed by micro-organisms are called Non-Biodegradable detergents.

**Q-2 what are Barbiturates? To which class of drugs do they belong? Give two examples.**

**Ans-2** Derivatives of barbituric acid are called barbiturates.They are tranquilizers. They also act as hypnotics.

eg- luminal , seconal.

**Q-3 what is the use of –**

(i) Benadryl (ii) sodium benzoate (iii) Progesterone

**Ans-3 (i)** Antihistamines

(ii) Preservatives

(iii) Antifertility drug

**Q-4 Identify the type of drug-**

(i) Ofloxacin (ii) Aspirin (iii) Cimetidine

**Ans- 4 (i)** Antibiotic (ii) Analgesics & Antipyretics

(iii) Antihistamines & antacid

**Q-5 Describe the following with suitable example-**

**(i) Disinfectant (ii) Analgesics**

**(iii) Broad spectrum antibiotics**

**(i) Disinfectant- chemicals used to kill the micro-organisms can applied on non living articles eg- 1%phenol.**

**(ii) Analgesics- They are the drugs which are used to relieve pain . eg – Aspirin , Ibuprofen.**

**(iii) Broad spectrum antibiotics- They kill the wide range of gram positive and gram negative bacteria.**

**Eg- Chloramphenicol , ofloxacin.**

**Value based question (04 marks)**

**On the occasion of world health day,Dr. Satpal organised a health camp for the poor farmers living in a near by villages.After check up ,he was shocked to see that most of the farmers suffered from cancer due to regular exposure to pesticides and many were diabetic.They distributed free medicines to them. Dr. satpal immediately reported the matter to the national human rights commision (NHRC). On the suggestions of NHRC,the govt. decided to provide medical care , financial assistance, setting up superspeciality hospitals for the treatment and prevention of the deadly diseases in the affected villages all over India.**

**i) Write the values shown by**

**(a) Dr.Satpal (b) NHRC**

**ii)what types of analgesics are used for the relief of terminal cancer**

**iii)give one example of artificial sweetener.**

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