## UNITED 16-CHEMISTRY IN EVERYDAY LIFE

### Points to remember

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Action</th>
<th>Example</th>
</tr>
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<tbody>
<tr>
<td>Analgesics</td>
<td>Relieving pain</td>
<td>Aspirin, Analgin, Seridon, Anacine,</td>
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<tr>
<td>(Narcotic)</td>
<td>Reduce tension and pain, produce unconsciousness.</td>
<td>Opium, Heroin, Pethidine, Codeine, Morphine</td>
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<tr>
<td>Antibiotics</td>
<td>Produced by micro-organism, that can inhibit the growth or destroy other micro-organism.</td>
<td>Penicillin G (Narrow Spectrum), Streptomycin, Ampicillin, Amoxycillin, Chloramphenicol, Vancomycin, Ofloxacin,</td>
</tr>
<tr>
<td>Antiseptics</td>
<td>Prevent the growth of micro-organism or kill them but not harmful to the living tissues.</td>
<td>Dettol, Bithional (in soap), Tincture iodine, 0.2% phenol,</td>
</tr>
<tr>
<td>Disinfectants</td>
<td>Kills micro-organisms, not safe for living tissues. It is used for toilets, instruments.</td>
<td>1% phenol, chlorine (Cl₂), Sulphurdioxide (SO₂)</td>
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<tr>
<td>Antacids</td>
<td>Reduce or neutralise the acidity.</td>
<td>NaHCO₃, Al(OH)₃ gel, MgCO₃, Mg(OH)₂, AIPO₄</td>
</tr>
<tr>
<td>Antihistamines</td>
<td>Reduce release of acid.</td>
<td>Cimetidine (Tagamet), Ranitidine (Zantac), Brompheniramine (Dimetapp), Terfenadine (Seldane), cetirizine</td>
</tr>
<tr>
<td>Tranquilizers</td>
<td>Reduce the mental anxiety, stress, (sleeping pill)</td>
<td>Valium, Serotonin, Veronal, Equanil, Amytal, Nembutal, Luminal, Seconal</td>
</tr>
<tr>
<td>Antipyretics</td>
<td>Reduce body temperature.</td>
<td>Aspirin, Paracetamol, Analgin, Phenacetin</td>
</tr>
<tr>
<td>Antifertility drugs</td>
<td>These are the steroids used to control the pregnancy</td>
<td>Norethindrone, Ethynylestradiol (novestrol)</td>
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</table>

**Drug-enzyme interaction:** Drugs inhibit the activities of enzymes. These can block the binding site of the enzyme and prevent the binding of substrate, or can inhibit the catalytic activity of the enzyme. Such drugs are called **enzyme inhibitors**. Drugs inhibit the attachment of substrate on active site of enzymes in two different ways:

(i) Drugs compete with the natural substrate for their attachment on the active sites of enzymes. Such drugs are called **competitive inhibitors**.

(ii) Some drugs do not bind to the enzyme’s active site. These bind to a different site of enzyme which is called **allosteric site**. This binding of inhibitor at allosteric site changes the shape of the active site in such a way that substrate can not recognise it.

**ANTAGONISTS:** The drugs that bind to the receptor site and inhibit its natural function.

**AGONISTS:** Drugs mimic the natural messenger by switching on the receptor.

### CHEMICALS IN FOOD

<table>
<thead>
<tr>
<th>Sweetening Agent</th>
<th>Saccharine, Aspartame (for cold foods), Alitame (stable at cooking temp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Preservative</td>
<td>Salt, sugar, veg. oils, sodium benzoate</td>
</tr>
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</table>

### CLEANSING AGENTS

<table>
<thead>
<tr>
<th>Soap</th>
<th>Na / K-salt of long chain fatty acids e.g. C₁₇H₃₅COONa</th>
<th>Not work in hard water becoz with Ca and Mg salt produce insoluble scum 2C₁₇H₃₅COONa + CaCl₂ → 2NaCl + (C₁₇H₃₅COO)₂Ca</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anionic detergent</td>
<td>Sodium laurylsulphate, CH₃(CH₂)₁₇CH₂OSO₄Na⁺</td>
<td>Used in household work / in tooth paste</td>
</tr>
<tr>
<td>Cationic detergent</td>
<td>Cetyltrimethyl ammonium bromide [CH₃(CH₂)₃N(CH₃)]⁺Br⁻</td>
<td>Hair conditioner / germicidal properties</td>
</tr>
<tr>
<td>Non ionic detergent</td>
<td>Ester of searic acid and polyethylene glycol, CH₃(CH₂)₁₀COO(CH₂CH₂O)nCH₂CH₂OH</td>
<td>Liquid dishwashing</td>
</tr>
</tbody>
</table>

Detergents with highly branched hydrocarbon parts are non biodegradable and hence water pollutants so branching is minimized which are degradable and pollution is prevented.
1. Define the term chemotherapy?
   Treatment of diseases using chemicals is called chemotherapy.

2. Why do we require artificial sweetening agents?
   To reduce calorie intake.

3. What are main constituents of Dettol?
   Choloro xylene & Terpineol.

4. Name the drugs that are used to control allergy?
   Antihistamines.

5. Why is the use of aspartame limited to cold food and drinks?
   It is unstable and decompose at cooking temperature and decompose.

6. What is a tranquilizer? Give an example
   This is the drug used in stress, mild mental disease.

7. What type of drug chloramphenicol?
   It is a broad spectrum antibiotic.

8. Why is biothional added to the toilet soap?
   It acts as antiseptics.

9. What are food preservatives?
   The substances that prevent spoilage of food due to microbial growth. eg- sodium benzonate.

SHORT ANSWER TYPE QUESTION

1. Mention one important use of the following-
   (i) Equanil
   (ii) Sucrose

2. Define the following and give one example-
   (i) Antipyretics
     Those drugs which reduce the temperature of fever are called Antipyretics. Eg- Paracetamol
   (ii) Antibiotics
     The drugs which prevent the growth of other micro-organisms. Eg- Pencillin.

3. Name the medicines used for the treatment of the following-
   (i) Tuberculosis
     Sterptomycin
   (ii) Typhoid
     Chloramphenicol

4. What is tincture of iodine?
   2-3% iodine in alcohol-water mixture is called tincture of Iodine. It is a powerful antiseptics and is applied on wounds.

5. What is artificial sweetening agent? Give two examples?
   The substances which give sweetening to food but don’t add calorie to our body. eg- Saccharin, alitame.

6. How is synthetic detergents better than soaps?
   (i) Detergents can be used in hard water but soaps cannot be used.
   (ii) Detergents have a stronger cleansing action than soaps.

7. What are sulpha drugs? Give two examples?
   A group of drugs which are derivatives of sulphanilamide and are used in place of antibiotics called sulpha drugs. Eg-sulphadizine, sulphanilamide.
8. What forces are involved in holding the active sites of the enzymes?
   The forces involved in holding the active sites of the enzymes are hydrogen bonding, ionic bonding, dipole-dipole attractions or Vander Waals force of attractions.

9. Describe the following giving an example in each case-
   (i) Edible colours
   (ii) Anti fertility drugs
     (i) Edible colours - They are used for dying food. Eg: saffron is used to colour rice.
     (ii) Anti fertility drugs - Those drugs which control the birth of the child are called anti fertility drugs.

10. Give two examples of organic compounds used as antiseptics?
    Phenol (0.2%), iodoform

SHORT ANSWER TYPE QUESTION

1. What are Biodegradable and non-biodegradable detergents? Give one example of each.
   The detergents having straight hydrocarbon chain and are easily decomposed by micro organisms are called Biodegradable detergents. For eg. sodium lauryl sulphate. The detergents having branched hydrocarbon chain and are not easily decomposed by micro-organisms are called Non-Biodegradable detergents. Sodium 4 (1-dodecyl) benzene sulphonate

2. What are barbiturates? To which class of drugs do they belong? Give two examples.
   Derivatives of barbituric acid are called barbiturates. They are tranquilizers. They also act as hypnotics. eg - luminal, seconal.

3. What is the use of (i) Benadryl (ii) sodium benzoate (iii) Progesterone
   (i) Antihistamines
   (ii) Preservatives
   (iii) Antifertility drug

4. Identify the type of drug-
   (i) Ofloxacin (ii) Aspirin (iii) Cimetidine
   (i) Antibiotic (ii) Analgesics & Antipyretics
   (iii) Antihistamines & antacid

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.
   (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, oxfloxacin.

Value Based Questions

1) There is a poster with the slogan” Hum do hamare do” pasted on a wall
   Answer the following questions based on above slogan:
   i) What message does above slogan convey?
   ii) Use of condoms and anti-fertility drugs help in avoiding pregnancy. Name one anti-fertility drug and one polymer used in the manufacture of condoms
   iii) Which value is promoted through the poster? What are the disadvantages and advantages related to violation of this value?
   A: i) Family planning
      ii) Norethindrone or novestrol
      iii) Values: population control, the increase population has caused many social problems such as shortage of food, environmental issues, unemployment etc.
2) You have gone to a chemist shop to get medicines. A person is pleading with the shopkeeper to get sleeping pills without doctor’s prescription. The Chemist is reluctant to give him sleeping pills without doctor’s prescription stating that the pills can be misused and have adverse effects.

Answer the following questions based on the above information

i) Should the shopkeeper give sleeping pills to the customer even when he does not have doctor's prescription. Justify your answer

   A: a) i) No. Such medicines should not be given without proper prescription or verification because these medicines can be used in many ways. An overdose of these pills can even result in death of a person.
   ii) alternatives: a) Directly taking to doctor and seeking his/her advice
       Value: Professional ethnics
       b) Seeking more information about patient’s past history to know the reasons for sleeplessness and advising the customer to consult another doctor before taking sleeping pills.

ii) Is there any alternative approach / action the shopkeeper can take to help the customer without giving him the pills? Which values are reflected in this alternative approach?

   A: i) No. Such medicines should not be given without proper prescription or verification because these medicines can be used in many ways. An overdose of these pills can even result in death of a person.
   ii) alternatives: a) Directly taking to doctor and seeking his/her advice
       Value: Professional ethnics
       b) Seeking more information about patient’s past history to know the reasons for sleeplessness and advising the customer to consult another doctor before taking sleeping pills.

3) Ashraf is 50 years old and has diabetes. He uses saccharine as sweetening agent in tea and coffee and sugar free in sweets. Lakshmi too is diabetic. She controls her sugar level in diet by using less sugar and by exercising.

   a. Who is able to handle diabetes more efficiently and why?

   b. What value do you derive from this?

   c. What are the harmful effects of artificial sweeteners?

   A: a) Lakshmi is able to handle diabetes better, because exercises activate the pancreases to produce insulin. Exercise keeps one fit and fine.
   b. It is necessary to lead a disciplined life.
   c. Researches have shown that the artificial sweeteners have harmful effect on the body because they are not excreted easily.

4) Ajay observed that his friend Abhay was showing a change in behaviour from past couple weeks. Abhay stayed aloof, did not play and mingle with friends and became easily irritable. He avoided going in any function and parties. Ajay shares his concerns with his class teacher. The teacher calls Abhay’s parents and advises them to consult a doctor. Doctor prescribes antidepressant drugs for him

   i) Name some antidepressant drugs
   ii) Mention the values shown by Ajay
   iii) How should Abhay’s family help him other than medicines?

   A: i) Iproniazid and Phenelzine
   ii) Concern of friend, caring nature, health concern
   iii) By trying to help him stay happy, self-worthy, sharing his problems