DAY THIRTY FIVE

Chemistry in Everyday Life

Learning & Revision for the Day

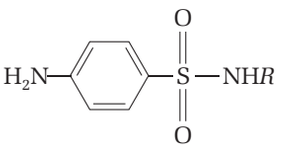
- Chemicals in Medicines
- Chemicals in Food
- Cleansing Agents

Chemicals in Medicines

Drugs are chemicals of low molecular masses, which interact with macromolecular targets (carbohydrates, proteins and nucleic acids) to produce a biological response. When the biological response is therapeutic and useful, these chemicals are called medicines. The branch of chemistry that deals with the use of such chemicals to cure a disease or to prevent it, is called **chemotherapy**.

Drugs can be classified mainly on criteria outlined as follows:

1. **On the Basis of Pharmacological Effect** It provides the whole range of drugs available for the treatment of a particular type of disease or infection, e.g. analgesics have pain-killer effect while antiseptics kill or arrest the growth of microorganisms.
2. **On the Basis of Drug Action** It is based on the action of a drug on the particular biochemical process, e.g. all antihistamines inhibit the action of histamine which causes inflammation in the body.
3. **On the Basis of Chemical Structure** Drugs classified in this way share common structural features and often have similar pharmacological activity, e.g. all sulphonamide drugs, having the common features as given below are mostly antibacterial.



4. **On the Basis of Molecular Targets** Drugs are classified on the basis of their interaction with biomolecules such as carbohydrates, lipids, proteins and nucleic acids.

- Drugs which can block the binding site of the enzyme and prevent the binding of substrate or can inhibit the catalytic activity of the enzyme are called **enzyme inhibitors**.
- Drugs which compete with the natural substrate for their attachment on the active sites of enzymes are called **competitive inhibitors**.
- If the bond formed between an enzyme and drug (inhibitor) is strong covalent bond then the body degrades the enzyme-drug (inhibitor) complex and synthesises new enzyme.

Therapeutic Action of Different Classes of Drugs

Some important classes of drugs are given below:

1. **Antacids** are used for treatment of acidity. Antacids neutralise the excess acid and raise the pH of stomach to some appropriate level. Sodium hydrogen carbonate, a mixture of aluminium and magnesium hydroxide etc., are the commonly used antacids.
2. **Antihistamines or antiallergic drugs** are used as treatment for allergies. Allergies are caused by an excessive response of the body to allergens (the substances which causes allergies). Excessive secretion of histamines, a chemical secreted by mast cells in body, also cause allergy, e.g. diphenylhydramine, chlorpheniramine, promethazine etc. Some synthetic drugs, e.g. brompheniramine (dimetapp) and terfenadine (seldane), also act as antihistamines.
3. **Neurologically Active Drug** Various types of neurologically active drugs are as follows:
   (i) **Tranquilizers** is a class of chemical compounds used for the treatment of stress, fatigue mild and severe mental diseases. These are commonly called **psychotherapeutic** drugs. These are the essential components of sleeping pills.

   Some examples according to the action of drugs are:
   - Antidepressant drugs, e.g. iproniazid, phenelzine etc., are used to reduce depression.
   - Chlordiazepoxide and meprobamate are relatively mild tranquilizers, suitable for relieving tension. Equanil is used in controlling depression and hypertension.
   - Barbiturates such as seconal, luminal, veronal are hypnotic (sleep producing) drugs while valium and serotonin are non-hypnotic drugs.
   - Reserpine, a powerful tranquiliser is obtained from Indian plant *Rauwolfia serpentina* helps slow down the pulse rate and lowers the blood pressure.
   - Sedatives act as depressant and suppress the activities of the central nervous system. These produce a feeling of calmness, relaxation, drowsiness in the body, e.g. valium (diazepam), calmpose and barbiturates.

   (ii) **Analgesics** reduce or abolish pain. These are classified as follows:
   (a) **Non-narcotic** (non-addictive) analgesics, e.g. aspirin (acetyl salicylic acid) and paracetamol are analgesics (N-acetyl-*p*-aminophenol) as well as antipyretics (fever reducing). Aspirin inhibits the synthesis of chemicals, known as prostaglandins which stimulate inflammation in the tissue and cause pain. Because of its antiblood clotting action, aspirin is also used in the prevention of heart attacks.
   (b) **Narcotic analgesics** These are chiefly used for the relief of post operative pain, cardiac pain and pains of terminal cancer and in child birth e.g. morphine, heroin (morphine diacetate), codeine etc. When administered in medicinal doses, relieve pain and produce sleep.
4. **Antimicrobial drugs** tends to destroy or prevent development or inhibit the pathogenic action of microbes such as bacteria virus or other parasites. Antibiotics, antiseptics and disinfectants are antimicrobial drugs.
   (i) **Antibiotics** are the chemicals synthesised from microbes and have either cidal (killing) effect or a static (inhibitory) effect on microbes. A few examples of the two types of antibiotics are as follows:
   (a) Bactericidal, e.g. penicillin (a narrow spectrum antibiotic), ampicillin and amoxycillin (semisynthetic modification of penicillin), ofloxacin (broad spectrum), aminoglycosides, i.e. streptomycin (broad spectrum) etc.
   (b) Bacteriostatic, e.g. erythromycin, tetracycline, chloramphenicol (a broad spectrum antibiotic) etc.

   (ii) **Antiseptics** are applied to the living tissues such as wounds, cuts, ulcers and diseased skin surfaces, e.g. furacine, soframycin, dettol (a mixture of chloroxylenol and α-terpineol), 0.2 per cent solution of phenol, bithionol is added to soaps, iodine, Boric acid etc.

   (iii) **Disinfectants** are applied to inanimate objects such as floors, drainage system, e.g. 1 per cent solution of phenol, chlorine and SO_2 (in very low concentrations).
5. **Antifertility drugs** have lead to the concept of family planning. Birth control pills essentially contain a mixture of synthetic estrogen and progesterone derivatives, e.g. commonly used pills contain a mixture of norethindrone (progesterone derivative) and ethinylestradiol or novestrol (estrogen).

NOTE The therapeutic properties of a drug depends upon its relative toxicity to the parasite and the host.

$$\text{Therapeutic Index (TI)} = \frac{\text{Maximum Tolerated Dose (MTD)}}{\text{Maximum Curative Dose (MCD)}}$$

The higher the therapeutic index ratio, the safer the drug will be.

Chemicals in Food

Substances which are added to food either to improve its taste, nutritive value and flavour or to preserve it are called food additives. Some important chemicals in food are as follows:

1. **Artificial sweetening agents** controls the intake of calorie and tooth decay. Some examples of artificials weetening agents are saccharin (*ortho*-sulphobenzimide), aspartame (nutra sweet), sucralose, alitame etc. Alitame is high potency sweetener, although it is more stable than aspartame. Sucralose is trichloro derivative of sucrose. Its appearance and taste are sugar like. It is stable at cooking temperature. Hence, its use is of great value to diabetic persons who need to control intake of calories.
2. **Food preservatives** prevent spoilage of food due to microbial growth. e.g. sodium benzoate, salts of sorbic acid and propanoic acid etc.

Cleansing Agents

These are also known as **surfactants** or surface active agents. In fact, those chemicals which concentrate at the surface of the solution or interfaces, form surface films, reduce surface tension of the solution and help in removing dirt and dust by emulsifying grease are known as **surfactants**. Soaps and detergents belong to this class.

Soaps

These are the sodium or potassium salts of higher fatty acids and are prepared by alkaline hydrolysis of fats or oils. Fats or oils are esters of higher fatty acids.

The reaction is known as **saponification**.

Glyceryl ester of stearic acid (fat) + caustic soda $\longrightarrow$ soap + glycerol

Different types of soaps are made by using different raw materials. These are as follows:

1. **Toilet soaps** are prepared by using better grades of fats and oils and care is taken to remove excess alkali.
2. **Transparent soaps** are made by dissolving the soap in ethanol and then evaporating the excess solvent.
3. **Medicated soaps** contain substances of medicinal value.
4. **Shaving soaps** contain glycerol to prevent rapid drying. A gum called rosin is added while making them.
5. **Laundry soaps** contain fillers like sodium rosinate, sodium silicate, borax and sodium carbonate.

Cleansing Action of Soap

- On applying soap to a dirty wet cloth, the hydrocarbon part (non-polar part) of soap dissolves in grease or dust while the polar carboxylate part is directed towards water. Thus, an emulsion is formed between grease particles and water molecules which appears in the form of foam. On washing the cloth with excessive water, these dirt or dust or grease particles are washed away from the surface of cloth along with soap and the cloth becomes clean.
- Soaps do not work in hard water because hard water contains calcium and magnesium ions. These ions form insoluble calcium and magnesium salts of soaps respectively that separate as sum in water.

Synthetic Detergents

These are alkyl benzene sulphonates. These are also called **syndets**. The detergents are classified into following three types on the basis of ionic charge present at the soluble end of their chain. These are as follows:

1. **Anionic detergents** are the sodium salts of sulphonated long chain alcohols or hydrocarbons. Anionic part of these detergents is involved in the cleansing action. These are formed by neutralising alkyl benzene sulphonic acids with alkali.

   e.g. sodiumdodecyl benzene sulphonate Anionic detergents are used in toothpastes and house hold work.
2. **Cationic detergents** are quarternary ammonium salts of amines with acetates, chlorides or bromides as anions. e.g. cetyltrimethyl ammonium bromide
   These are used in hair conditioners and are expensive, therefore these are of limited use.
3. **Non-ionic detergents** do not contain any ion in their constitution. When stearic acid reacts with polyethylene glycol, non-ionic detergent is formed. e.g. ester of stearic acid and polyethylene glycol.

   These are used in liquid dishwashing detergents.

NOTE
- **Detergents** can be used both in soft and hard water as they give foam even in hard water.
- **Straight chain alkyl groups** containing detergents are biodegradable whereas branched chain alkyl groups containing detergents are non-biodegradable.

DAY PRACTICE SESSION 1

FOUNDATION QUESTIONS EXERCISE

1 The pair whose both species are used in antacid medicinal preparation is
(a) $NaHCO_3$ and $Mg(OH)_2$
(b) Na_2CO_3 and $Ca(HCO)_2$
(c) $Ca(HCO_3)_2$ and $Mg(OH)_2$
(d) $Ca(OH)_2$ and $NaHCO_3$

2 Which of the following compounds is not an antacid?
→ JEE Main 2015
(a) Aluminium hydroxide (b) Cimetidine
(c) Phenelzine (d) Ranitidine

3 The drug given during hypertension is
(a) streptomycin (b) chloroxylenol
(c) equanil (d) aspirin

4 The drug used as an antidepressant is
(a) luminal (b) tofranil
(c) mescaline (d) sulphadiazine

5 H_1-receptor antagonists is a term associated with
→ JEE Main (Online) 2013
(a) antiseptics (b) antihistamines
(c) antacids (d) analgesics

6 The local anaesthetic, which is used for small surgical operation is
(a) ether (b) nitrous oxide
(c) cyclopropane (d) procaine

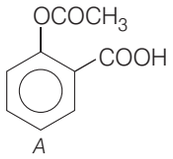
7 Barbituric acid and its derivatives are well known as
(a) tranquilizers
(b) antiseptics
(c) analgesics
(d) antipyretics

8 Tranquilizers are the substances used for the treatment of
(a) cancer (b) AIDS
(c) mental diseases (d) physical disorders

9 Substances used in bringing down the body temperature in high fever are called
(a) antiseptics (b) pyretics
(c) antibiotics (d) antipyretics

10 A drug that is antipyretic as well as analgesic is
(a) chloropromazine hydrochloride
(b) *para*-acetamidophenol
(c) chloroquine
(d) penicillin

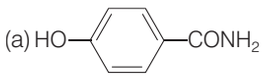
11 Compound *A* given below is

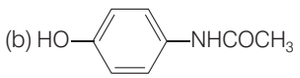


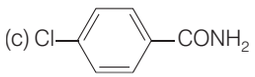
A

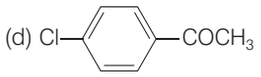
(a) antiseptic (b) antibiotic
(c) analgesic (d) pesticide

12 The correct structure of the drug paracetamol is

(a) 

(b) 

(c) 

(d) 

13 Aspirin is known as → AIEEE 2012
(a) acetyl salicylic acid (b) phenyl salicylate
(c) acetyl salicylate (d) methyl salicylic acid

14 A broad spectrum antibiotic is
(a) paracetamol (b) penicillin
(c) aspirin (d) chloramphenicol

15 Which of the following statements about aspirin is not true? → JEE Main (Online) 2013
(a) It is effective in relieving pain
(b) It is a neurologically active drug
(c) It has antiblood clotting action
(d) It belongs to narcotic analgesics

16 An ester used as medicine is
(a) ethyl acetate (b) methyl acetate
(c) methyl salicylate (d) ethyl benzoate

17 One of the most widely used drug in medicine iodex is
(a) methyl salicylate (b) ethyl salicylate
(c) acetyl salicylic acid (d) *o*-hydroxy benzoic acid

18 Streptomycin, a well known antibiotic, is a derivative of
(a) peptides (b) carbohydrates
(c) purines (d) None of these

19 Chloramine-T is a
(a) antiseptic (b) disinfectant
(c) analgesic (d) antipyretics

20 The functional groups present in salol are
(a) $-NH_2$ and $-OR$ (b) $-NH_2$ and $-COOH$
(c) $-OR$ and $-OH$ (d) $-OH$ and $-COOR$

21 Which of the following is used as an antiseptic?

(a) Phenol (b) Benzaldehyde
(c) Benzalamine (d) Maleic anhydride

22 Match the following and choose the correct option.

	Column I		Column II
A.	Ranitidine	1.	Tranquilizer
B.	Furacine	2.	Antibiotic
C.	Phenelzine	3.	Antihistamine
D.	Chloramphenicol	4.	Antiseptic

Codes

	A	B	C	D
(a)	3	4	1	2
(b)	4	1	2	3
(c)	3	1	4	2
(d)	4	2	1	3

23 Which of the following is used as a "morning after pill"?

(a) Mifepristone (b) Ethynylestradiol
(c) Northindrone (d) Bithional

24 Which of the following will not enhance nutritional value of food?

(a) Minerals (b) Artificial sweeteners
(c) Vitamins (d) Amino acids

25 Among the following sweeteners, which one has the lowest sweetness value?

(a) Alitame (b) Aspartame (c) Saccharin (d) Sucralose

26 Which of the following is known as invert soap?

(a) Pentaerythritol monostearate
(b) Sodium stearyl ammonium bromide
(c) Sodium stearyl sulphate
(d) Ethoxylated nonyphenol

27 Which of the following represents soap?

(a) $C_{17}H_{35}COOH$ (b) $C_{17}H_{35}COOK$
(c) $C_{15}H_{31}COOH$ (d) $C_{17}H_{35}(COO)_2Ca$

28 Which of the following is not true for a detergent molecule?

(a) It has a non-polar organic part and a polar group
(b) It is not easily biodegraded
(c) It is sodium salt of a fatty acid
(d) It is a surface active reagent

29 Which of the following is an anionic detergent?

(a) Sodium lauryl sulphate
(b) Cetyltrimethyl ammonium bromide
(c) Glyceryl oleate
(d) Sodium stearate

30 Match the chemicals in List I with their uses in List II.

	List I		List II
A.	Sodium perborate	1.	Disinfectant
B.	Chlorine	2.	Antiseptic
C.	Bithional	3.	Milk bleaching agent
D.	Potassium stearate	4.	Soap

Codes

	A	B	C	D
(a)	2	1	3	4
(b)	3	4	2	1
(c)	3	1	2	4
(d)	2	3	4	1

Direction (Q. Nos. 31-32) *In the following questions a Assertion (A) following by Reason (R) is given. Choose the correct answer out of the following choices.*

(a) Both A and R are true and R is correct explanation of A
(b) Both A and R are true but R is not correct explanation of A
(c) A is true but R is false
(d) Both A and R are false

31 **Assertion** (A) All chemicals added to food items are called food preservatives.

Reason (R) All these chemicals increase the nutritive value of the food.

32 **Assertion** (A) Sodium chloride is added to precipitate soap after saponification.

Reason (R) Hydrolysis of esters of long chain fatty acids by alkali produces soap in colloidal form.

Direction (Q. Nos. 33-35) *Each of these questions contains two statements : Statement* I *(Assertion) and Statement* II *(Reason). Each of these questions also has four alternative choices, only one of which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below.*

(a) Statement I is true, Statement II is true; Statement II is the correct explanation for Statement I
(b) Statement I is true, Statement II is true; Statement II is not the correct explanation for Statement I
(c) Statement I is true; Statement II is false
(d) Statement I is false; Statement II is true

33 **Statement I** Tranquilizers are used for the treatment of stress and mild or even severe mental diseases.

Statement II Tranquilizers are neurologically active drugs. These affect the message transfer mechanism from nerve to receptor.

34 **Statement I** Aspirin can cause ulcer in stomach when taken empty stomach.

Statement II Aspirin prevents platelet coagulation as it has antiblood clotting action.

35 **Statement I** Tertiary butyl hydroquinone is an antioxidant.

Statement II Antioxidants inhibit free radical reactions.

DAY PRACTICE SESSION 2

PROGRESSIVE QUESTIONS EXERCISE

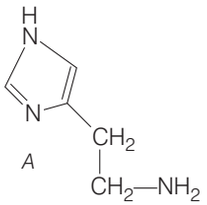
1 The reagents used in the preparation of aspirin from salicylic acid.

(a) $SOCl_2$, pyridine (b) CH_3COOH, HCl
(c) CH_3Cl, $AlCl_3$ (d) $(CH_3CO)_2O, H^+$

2 Which of the following can possibly be used as analgesic without causing addiction and modification?

(a) Morphine
(b) N-acetyl-*para*-aminophenol
(c) Diazepam
(d) Tetrahydrocatenol

3 The drug *A* is used as a/an



(a) antacid (b) analgesic (c) vasodilator (d) antiseptic

4 Compound which is added to soap to impart antiseptic properties is

(a) sodium lauryl sulphate
(b) sodium dodecylbenzenesulphonate
(c) rosin
(d) bithional

5 Which of the following statements is not correct?

(a) Some antiseptics can be added to soaps
(b) Dilute solutions of some dis-infectants can be used as an antiseptic
(c) Disinfectants are anti-microbial drugs
(d) Antiseptic medicines can be ingested

6 Detergents are known to pollute rivers and water ways. However, detergents can be made biodegradable and pollution free by taking

(a) cyclic hydrocarbon chain
(b) shorter hydrocarbon chain
(c) unbranched hydrocarbon chain
(d) hydrocarbon with more branching

7 The ratio of the therapeutic index is ten means

(a) ten times a dose used for curative purposes would kill the parasite as well as the patient
(b) to cure the patient the dose should be given 10 times to him
(c) 10 times dose given, would not be sufficient to cure the patient
(d) the dose should be given for 10 days

8 Antiseptics and disinfectants either kill or prevent growth of microorganisms. Identify which of the following is not true?

(a) A 0.2% solution of phenol is an antiseptic while 1% solution acts as a disinfectant
(b) Chloride and iodine are used as strong disinfectants
(c) Dilute solutions of boric acid and hydrogen peroxide are strong antiseptics
(d) Disinfectants harm the living tissue

9 Which of the following is not true for antibiotics?

(a) Tetracycline is one of the broad spectrum antibiotic which is effective against a large number of harmful microorganisms
(b) Streptomycin is highly effective against microorganisms which cause tuberculosis
(c) Penicillin has a narrow spectrum and certain persons are sensitive to it
(d) Penicillin may be administered without testing the patients for sensitivity to it

10 The pH value of gastric juice in human stomach is about 1.8 and in the small intestine it is about 7.8. The pK_a value of aspirin is 3.5. Aspirin will be

(a) ionised in the small intestine and almost unionised in the stomach
(b) unionised in the small intestine and in the stomach
(c) completely ionised in the small intestine and in the stomach
(d) ionised in the stomach and almost unionised in the small intestine

ANSWERS

SESSION 1

1 (a)	**2** (c)	**3** (c)	**4** (a)	**5** (b)	**6** (d)	**7** (a)	**8** (c)	**9** (d)	**10** (b)
11 (c)	**12** (b)	**13** (a)	**14** (d)	**15** (d)	**16** (c)	**17** (a)	**18** (b)	**19** (b)	**20** (d)
21 (a)	**22** (a)	**23** (a)	**24** (b)	**25** (b)	**26** (b)	**27** (b)	**28** (c)	**29** (a)	**30** (c)
31 (d)	**32** (a)	**33** (a)	**34** (c)	**35** (a)					

SESSION 2

1 (d)	**2** (b)	**3** (c)	**4** (d)	**5** (d)	**6** (c)	**7** (a)	**8** (c)	**9** (d)	**10** (a)

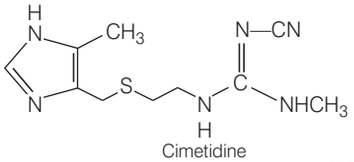
Hints and Explanations

SESSION 1

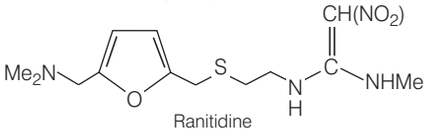
1 Pair of $NaHCO_3$ and $Mg(OH)_2$ are used in antacid medicinal preparation.

2 The term antihistamine refers only to compounds not have inhibit action at the H_1-receptor so, the term H_1-receptor antagonists is related with antihistamines.

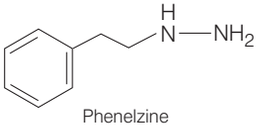
3 Aluminium hydroxide $Al(OH)_3$, cimetidine and ranitidine are antacids while phenelzine is a tranquilizer.



Cimetidine



Ranitidine



Phenelzine

4 Equanil is a tranquilizer that is widely used during depression and hypertension.

5 Luminal is used as an antidepressant.

6 Procaine is a local anaesthetic, which affects only a part of the body insensitive to pain or feeling. Ether, nitrous oxide and cyclopropane are general anaesthetics.

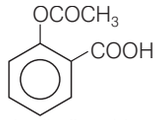
7 The drugs given to the patients suffering from anxiety and mental tension are called tranquilizers, e.g. barbituric acid and its derivatives.

8 Tranquilizers reduce anxiety and are employed for treatment of mental diseases.

9 The chemical substances used to bring down the body temperature in case of high fever are called antipyretics, e.g. analgin.

10 *para*-acetamidophenol is used as an antipyretic as well as analgesic.

11



o-acetyl salicylic acid
(Aspirin)

It is used as an analgesic.

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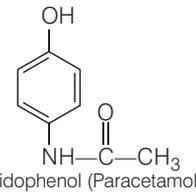
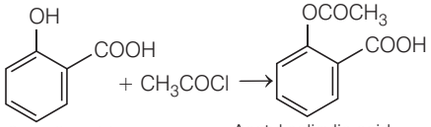


4-acetamidophenol (Paracetamol)

Paracetamol is most popular non-addictive analgesic (pain-killer) and antipyretic (fever reducing).

13 Aspirin is acetyl derivative of salicylic acid.



Salicylic acid — Acetyl salicylic acid (Aspirin)

14 Broad spectrum antibiotics are the medicines effective against a large number of harmful microorganisms, e.g. tetracycline, chloramphenicol.

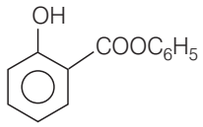
15 Aspirin is a non-narcotic (non-habit forming) analgesic, i.e. give relief from pain and also it has antiblood clotting action. It is a neurologically active drug.

16 An ester used as medicine is methyl salicylate.

17 Methyl salicylate is widely used in iodex. It is also known as oil of winter green.

18 Streptomycin is a carbohydrate derivative. It is highly effective against tuberculosis.

20 In salol (phenyl salicylate), functional groups are —OH and —COO*R*.



21 0.2 per cent solution of phenol acts as an antiseptic and its 1% solution is a disinfectant.

22 A ⟶ 3; B ⟶ 4; C ⟶ 1; D ⟶ 2

23 Mifepristone is an anti-fertility drug used as "morning after pill".

24 Artificial sweeteners will not enhance nutritional value of food. It is non-calorific substitute for sugar.

25 (i) Aspartame is 100 times sweeter than sugar (used only in cold foods and soft drinks).
(ii) Saccharin is 550 times sweeter than sugar.
(iii) Sucralose is 600 times sweeter than sugar.
(iv) Alitame is 2000 times sweeter than sugar (the later three are used for cooking and baking).

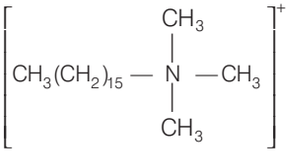
26 Sodium stearyl ammonium bromide is known as invert soap.

27 Soaps are the sodium or potassium salts of higher fatty acids.
e.g. $C_{17}H_{35}COOK$ (potassium stearate).
These are obtained by alkaline hydrolysis of oils and fats (saponification).

28 Soap is a sodium or potassium salt of fatty acids while detergent is a sodium salt of benzene sulphonic acid derivatives.

29 Sodium lauryl sulphate $[(CH_3(CH_2)_{10}CH_2OSO_3^-Na^+)]$ is an anionic detergent

Cetyltrimethy ammonium bromide



Br^- is a cationic detergent.

Glyceryl oleate $[(C_{17}H_{32}COO)_3C_3H_6]$ is a non-ionic detergent.

Sodium stearate $[C_{17}H_{35}COO^-Na^+]$ is a anionic soap.

30 A $\longrightarrow$ 3; B $\longrightarrow$ 1; C $\longrightarrow$ 2; D $\longrightarrow$ 4

31 **Correct Assertion** Chemicals which are used to protect food against bacteria, yeasts and moulds are called food preservatives.

Correct Reason Preservatives do not increase the nutritive value of food.

32 Sodium chloride is added to precipitate after saponification because hydrolysis of esters of long chain fatty acids by alkali produces soap in colloidal form.

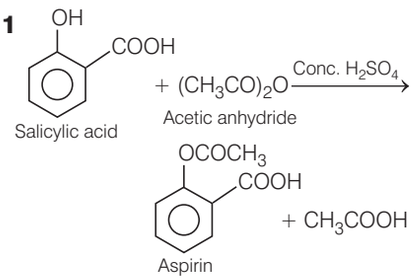
33 Tranquilizers are also known as psychotherapeutic drugs (neurological active drug) due to their purpose to reduce anxiety and are employed for the treatment of mental diseases by affecting the message transfer mechanism from nerve to receptor.

34 In the stomach, aspirin gets hydrolysed to form salicylic acid which ulcer when taken empty stomach. It prevents heart attack as it has antiblood clotting action.

35 Tertiary butyl hydroquinone is an antioxidant which when added to the fats and fat containing food, prevent their oxidation by interrupting the free radical chain reactions involved in lipid oxidation.

SESSION 2

1



2 N-acetyl para-aminophenol can be used as an analgesic without causing addiction and modification.

3 Drug *A* is a vasodilator that causes vasoditation, a widening (opening) of blood vessels that results from relaxation of the smooth muscle of the vessels.

4 Bithional is an antiseptic which is added to soap to reduce the odour produced by bacterial decomposition of organic matter on the skin.

5 Antiseptic can cause serious poisoning and possibly death if swallowed hence they can't be ingested.

6 Since, unbranched hydrocarbon chain are more prone to attack by bacteria, therefore the detergent can be made biodegradable and pollution free by taking unbranched hydrocarbon chain.

7 $TI = \dfrac{\text{maxium tolerated dose}}{\text{maximum curative dose}}$

If the ratio is ten, then it means ten times a dose used for curative purpose would kill the parasite as well as the patient.

8 Boric acid in form of dilute aqueous solution and hydrogen peroxide are a mild antiseptic used for washing eyes wounds, teeth and ears.

9 Penicillin has a narrow spectrum and is effective only against diseases caused by various cocci and some gram positive bacteria. However, some persons have allergy to penicillin. Hence, it is absolutely essential to test the sensitivity of the patient.

10 As the pK_a value of aspirin is 3.5. So, it will be ionised in small intestine as it is slightly basic and will remain unionised in the stomach due to its acidic medium.