



SUMMER-16 EXAMINATION

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Important Instructions to examiners:

- 1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language errors such as grammatical, spelling errors should not be given more Importance (Not applicable for subject English and Communication Skills).
- 4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
- 6) In case of some questions credit may be given by judgement on part of examiner of relevant answer based on candidate's understanding.
- 7) For programming language papers, credit may be given to any other program based on equivalent concept.



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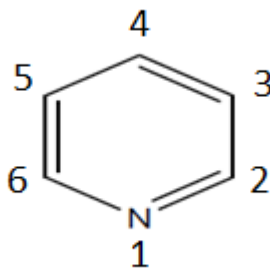
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Q.1 Attempt any EIGHT of the following (8X2) (16M)

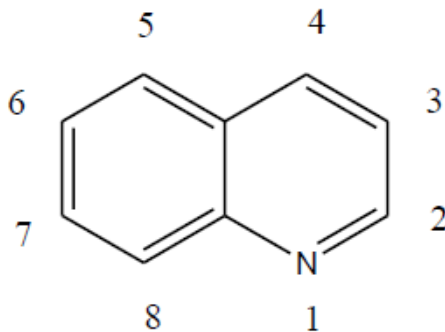
a) Give structure and method of numbering of (any two)

(01 mark to each structure with numbering)

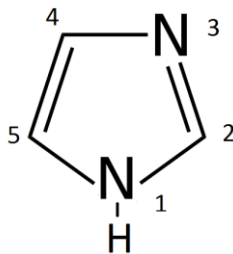
i. Pyridine



ii. Quinoline



iii. Imidazole





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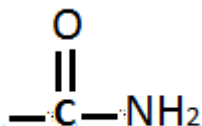
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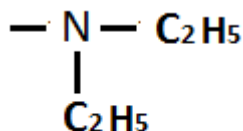
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b) Write structure of following groups (any two) (01 mark to each group)

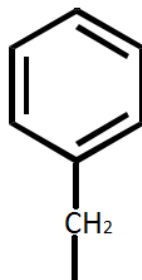
i. Carbamoyl



ii. Diethylamino



iii. Benzyl

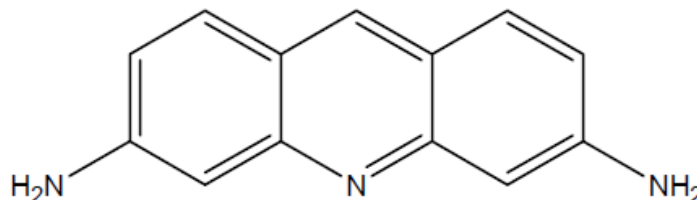


c) Give the name and structure of drug containing the following heterocycle (any two)

(1/2 mark for each structure and 1/2 mark for each Name)

i) Acridine

Name of drug :- Proflavine



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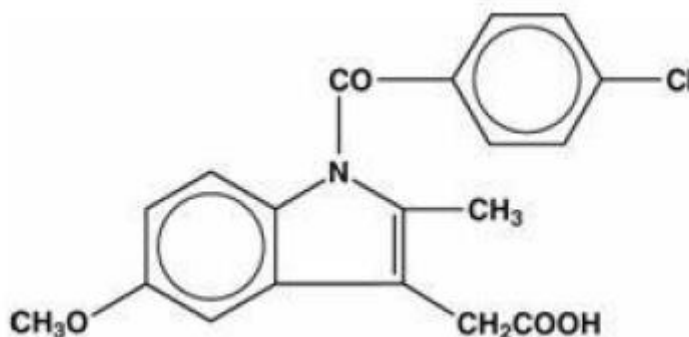
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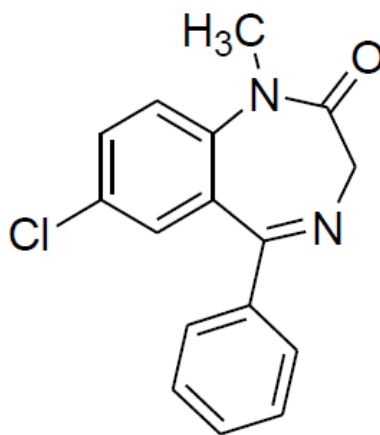
ii) Indole

Name of drug:- Indomethacin



iii) Benzodiazepine

Name of drug :- Diazepam



d) Give stability storage conditions of (any two)

(01 mark to each stability storage condition)

i) Thrombin Stability:

It is affected by air, heat and light.

Storage condition

It is stored in the atmosphere of nitrogen, in glass containers which are sealed so as to exclude microorganisms and moisture. The containers are kept at a temperature between 2° and 8° C and are protected from light. It may contain suitable bactericide.



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ii) Insulin Stability: Insulin is affected by heat, light and moisture.

Storage condition-

All insulin preparations must be stored at low temperatures between 2-8°C in a dark place. It should not be allowed to freeze.

iii) Ibuprofen Stability: It is stable compound.

Storage condition-

It is stored in well closed, tight container in a cool, dry place.

e) Explain the following terms (any two)

(01 mark to each)

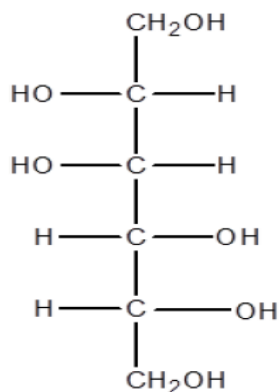
i) Tranquilizers: - Tranquillizers are CNS depressants which bring about a calming effect and induce a mild sedative effect.

ii) Lipid lowering agent: - Drugs which are used to reduce the elevated levels of the lipids in the blood are called Lipid lowering agents.

iii) Antiseptics: - Antiseptics are the agents that are used on living tissues & act as antimicrobial but don't kill them necessarily.

f) Write structure of following drugs (any two) (01 mark to each)

i) Mannitol





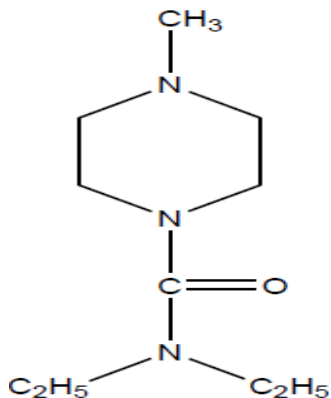
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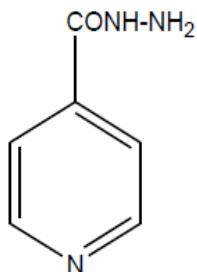
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ii) D.E.C.



iii) Isoniazid



g) Give the uses of (any two) (01 mark to each)

i) Analgin :-

1. It is used as antipyretic.
2. It is used analgesic.
3. Used as anti-rheumatic agent.

ii) Thyroxine :-

1. To treat Hypothyroidism.
2. To suppress Goiter.
3. To treat cretinism
4. To treat thyrotoxicosis.



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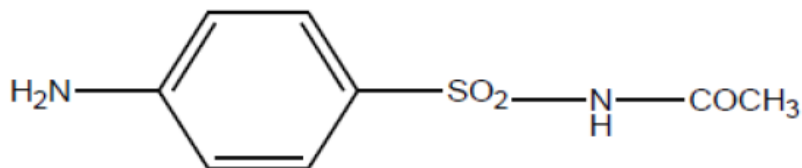
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iii) Promethazine :-

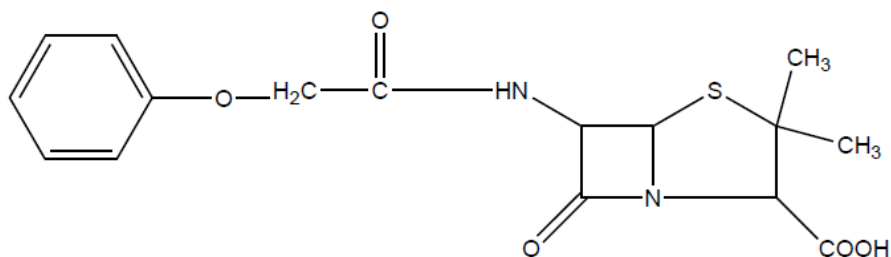
1. It has antihistaminic properties.
2. Used as an antiemetic drug.
3. It also has tranquilizing action.
4. It potentiates the action of other analgesic and sedative drugs.
5. Used in allergic conditions.

h) Draw structure from given chemical name (any two) (01 mark to each)

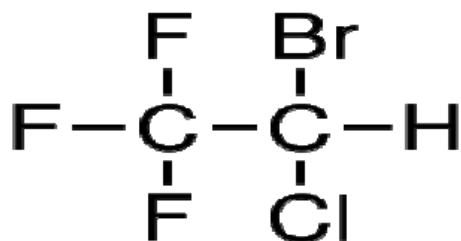
i) N'- acetyl sulfanilamide



ii) 6 (2-phenoxy acetamido) Penicillanic acid.



iii) 2-bromo, 2-chloro, 1, 1, 1- tri fluoroethane.





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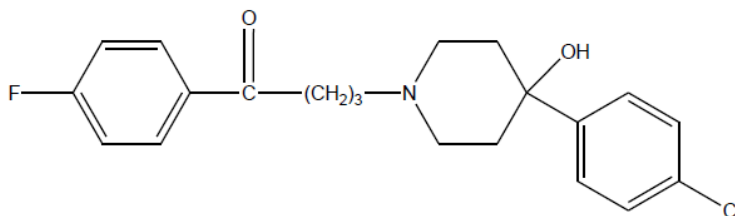
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i) Give the structure and uses of Haloperidol.

(01mark for structure and 01 mark for uses)

Haloperidol structure:-



Haloperidol uses:-

1. It is major tranquilizer and used to treat
 - Acute schizophrenia
 - Mania and hypomania
 - Behavioral disturbances
 - Sever anxiety
 - Childhood development disorders.
2. It is used to control nausea and vomiting.
3. It potentiates the actions of CNS depressant like analgesics, barbiturates, and anesthetics.
4. It is used to treat intractable hiccups.

j) Give the brand names of (any two)

(01 Mark each, at least Two Brands are expected)

- i) Diazepam :-** Calmpose, Valium, Placidox, Anaxol, Quietal, Diazewok, Zepose, Microdep.
- ii) Cotrimoxazole :-** Ciplin, Trisulfose, Tprim forte, Bactrim, Sepmax, Oriprim, Tabrol
- iii) Diphenhydramine :-** Benadryl Syrup, Bronolax Syrup, Abcof Syrup etc



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k) Name the drug used for (any two)

(01 Mark each, at least two drugs are expected)

- i) **Amoebiasis** :- Emetine, Clioquinol, Diiodohydroxyquinoline, Metronidazole, Tinidazole, Ornidazole, Carbarsone, Diloxanide furoate, Paramomycin, Erythromycin.
- ii) **Candidiasis** :- Nystatin, Amphotericin-B, Fluconazole, Ketoconazole, Itraconazole, Clotrimazole.
- iii) **Helminthiasis** :- Sodium antimony tartarate, Hycanthone, Niridazole, Dichlorophen, Diethylcarbamazine citrate, Piperazine citrate, Mebendazole, Albendazole, Thiabendazole, Pyruvinium pamoate, Pyrantel, Tetrachloroethylene.

l) Classify anticholinergic drugs with examples.

Classification - Anticholinergic drugs:

- 1. Amino alcohol esters- e.g. Atropine, Hyoscine, Propantheline
- 2. Amino alcohol ethers – e.g. Benzotropine
- 3. Amino alcohols – e.g. Biperiden
- 4. Amino amides – e.g. Tropicamide
- 5. Miscellaneous – e.g. Pirenzepine, Ethopropazine

OR

- 1. Natural alkaloids: Atropine, Hyoscine
- 2. Semisynthetic derivatives: Homatropine, Atropine methonitrate
- 3. Synthetic compounds:
 - a) Mydriatics- Tropicamide
 - b) Antisecretory/antispasmodics- Propantheline, Dicyclomine
 - c) Antiparkinsonian drugs-Biperiden, Benztropine



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Q No 2 Attempt any FOUR of the following (4 X 3) (12 M)

**a) What are narcotic analgesics? Give the properties and therapeutic uses of Pethidine?
(01mark for each meaning, properties, & uses)**

Narcotic analgesics are derivatives of opium, semisynthetic, synthetic agents having potent analgesic & narcotic activity and effective for the treatment of severe pain. They induce narcosis & hence the name.

Properties of Pethidine:

1. Its hydrochloride salt is official which occurs as an odorless, white, crystalline powder.
2. It has a slight acidic or bitter taste.
3. It is soluble in water and alcohol. It is practically insoluble in ether and benzene.

Therapeutic uses of Pethidine:

1. Used as substitute for morphine for the relief of most types of moderate to severe pains.
2. It is used as an analgesic especially in the treatment of pain due to spasm of intestine, uterus, bladder, bronchi etc.
3. It is useful in pains of myocardial infarction, burns and obstetrical gynecology operation.
4. It is used as preanesthetic medication in all major surgeries.

b) Classify Adrenergic drugs. Draw structure of any one catecholamine.

(02 marks for classification and 01 mark for structure)

The adrenergic drugs can be classified based on their chemical structure.

- 1) Catecholamines e.g : Adrenaline, Nor-adrenaline, Isoprenaline
- 2) Non-Catecholamines e.g. Phenylephrine, Salbutamol, Terbutaline, Ephedrine, Pseudoephedrine.
- 3) Imidazoline derivatives eg. Naphazoline, Tetrahydrozolum

OR

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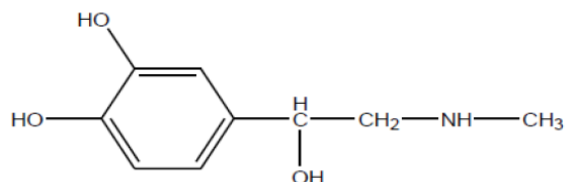
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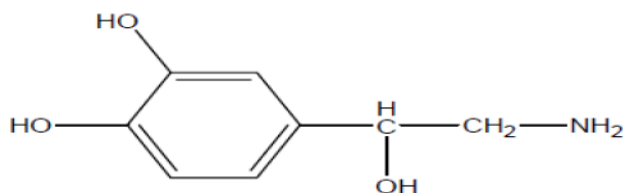
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1. Vasoconstrictors (\uparrow B. P.): Noradrenaline (Norepinephrine), Dopamine, Ephedrine etc.
2. Cardiac stimulants: Dopamine, Adrenaline, Isoprenaline
3. CNS stimulants: Amphetamine
4. Smooth muscle relaxants: Adrenaline, Isoprenaline, salbutamol etc.
5. Drugs used in allergic reactions: Ephedrine
6. Local vasoconstrictor/ nasal decongestants: Phenylephrine, pseudoephedrine
7. Anorectics: Amphetamine, Phentermine.

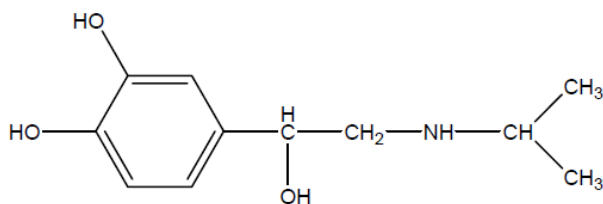
Adrenaline



Nor adrenaline



Isoprenaline





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c) Classify sulphonomides with examples. (03 Marks)

Chemical classification:-

- Substituents on aromatic amino group. E.g.-Prontosil.
- Substituents on sulfonamido nitrogen. E.g.-sulfadiazine, sulfamethoxazole.
- Substituents on both amino & sulfonamido group. E.g.-succinylsulfathiazole, phthalylsulfathiazole.
- Sulfas without aromatic amino group. E.g.-mafenide.

Pharmacological basis of classification

- As oral hypoglycemics. E.g.-Tolbutamide.
- As diuretics. E.g.-furosemide, chlorthalidone.
- As antimalarials. E.g.sulfadoxine.
- As antidiarrhoeals.E.g.phthalylsulfathiazole.
- As antibacterials. E.g.sulfadimidine, sulfadiazine.

Antibacterials classification

- Used in eye infections.e.g.Sulfacetamide
- Used in intestinal infections.e.g. sulfaguanidine,Phthalyl sulfathiazole,Succinyl sulfathiazole.
- Used in systemic infections.e.g. Sulfadiazine, Sulfadimidine,sulfathiazole etc.
- Used in burn infections.e.g.Silver Sulfadiazine
- Used in urinary tract infections.e.g.Sulfafurazole, Sulfaphenazole, Sulfamethaxazole etc.

Antibacterials can also be classified based on duration of action

- Long acting :Sulfas having $t/2$ of about 24 hours. E.g.sulfamethoxy-pyridazine, sulfadiamethoxine.
- Intermediate acting: sulfas having $t/2$ between 10-24 hours. E.g. sulfamethoxazole, sulfasomizole.
- Short acting:Sulfas having $t/2$ less than 10 hours.E.g. sulfathiazole, sulfisoxazole.
- Used in intestinal infections-Sulfaguanidine, Phthalyl sulfathiazole, Succinyl sulfathiazole.



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d) What are antifungal drugs? Write properties, storage condition and uses of amphotericin.

(01 mark for meaning, 01 mark for properties and storage, 01 mark for uses)

Antifungal drugs- These drugs are used in the treatment of variety of fungal infections like Candida, Epidermophyton, Microsporum, Trichophyton etc.

Properties:

1. It is yellow to orange colored powder, with a faint odor and tasteless.
2. It is practically insoluble in water & amphoteric in nature.
3. It is light sensitive.
4. In dilute solution it is inactivated at low pH.

Storage condition:

It is light sensitive so it should be stored in a light resistant container at a temperature between 2°C to 10°C.

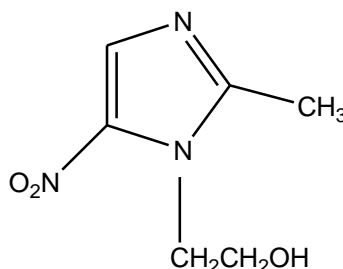
Uses:

1. It is used as antifungal agent & used to treat severe mycotic infections.
2. It is used in the treatment of candidiasis.
3. It is used in treatment of cutaneous leishmaniasis.

e) Give structure, chemical name and uses of metronidazole.

(01mark for structure, 01 mark for chemical name, and 01 mark for uses)

Structure:-



Chemical Name:- 2-(2-Methyl-5-nitroimidazo-1-yl) ethanol

OR

1-(2'-hydroxy-ethyl)-2-methyl-5-nitro imidazole.



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Uses:-

1. It has antiprotozoal and antibacterial action
2. Used in the treatment of severe intestinal amoebiasis
3. It is active against anaerobic bacteria like streptococci and H-Pylori
4. It is a primary drug in the treatment of hepatic amoebiasis
5. Treatment of *Trichomonous vaginalis*, infection due to *entamoeba histolytica*, *giardia Lamblia.bb*

f) Define Analeptics. Write properties and uses of caffeine.

(01 mark for definition, 01 mark for properties and 01 mark for uses)

Analeptics- These are the drugs which stimulate central nervous system; it often stimulates respiratory centers and other vasomotor centers.

Properties:

1. It occurs as white crystalline powder having bitter taste.
2. It sublimates on heating.
3. Sparingly soluble in water but very soluble in boiling water.
4. It is a very weak base.

Uses of Caffeine:

1. Stimulation of central nervous system.
2. Used as diuretic.
3. Vasodilation of peripheral vessels.
4. Decreases drowsiness.
5. Relieve mental fatigue and headache of certain kind like neuralgia, rheumatism, migraine etc.



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Q. 3 Attempt any FOUR of the following. (4x3) (12 M)

a) Define and classify antitubercular agents. Draw the structure of Ethambutol.

(01 mark for each)

Definition: The agents used in treatment of tuberculosis, a disease caused by *Mycobacterium* species (*M. Tuberculosis*, *M. bovis* or *M. africanum*) characterized by formation of nodular bodies or tubercles.

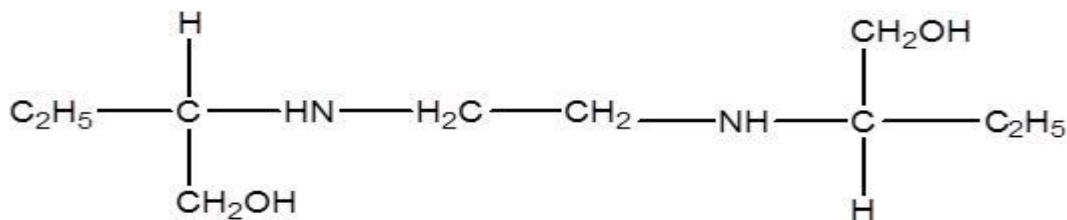
Classification of Antitubercular drugs:

- i) p-amino salicylic acid derivative – e.g. PAS
- ii) Pyridine derivatives – e.g. Isoniazid, Ethionamide
- iii) Pyrazine derivatives- e.g. Pyrazinamide
- iv) Ethylene diamine derivatives – e.g. Ethambutol
- v) Antibiotics – e.g. Cycloserine, Streptomycin, Rifampicin

It can be also classified as

- i) First line drugs
e.g. Isoniazid, Rifampin, Ethambutol, Pyrazinamide, Streptomycin, Thioacetazone etc.
- ii) Second line drugs
e.g. Ethionamide, Kanamycin, capreomycin, Cycloserin, Para amino salicylic acid etc.
- iii) Third line drugs
e.g. Clarithromycin, Thioacetazone

Structure of Ethambutol:





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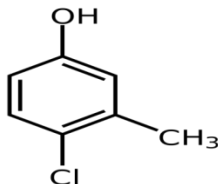
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b) Give the structure, chemical name and uses of chlorocresol.

(01 mark each for structure, chemical name and uses of chlorocresol)

Ans: Structure



Chemical name: 4-Chloro-3-methyl phenol.

Uses:

1. It is used as an antiseptic.
2. Used as preservative in water containing creams and other preparations for external use.
3. It is also used as disinfectant.
4. Used in concentration of 0.1% as a bacteriostat and in concentration of 0.2 % in the process of sterilization with bactericide.

c) Define cholinergic agents. Write the uses of Pilocarpine and Physostigmine.

(01 mark for definition and 01 mark each for uses)

Ans:

Definition:

The agents that mimic the action of acetylcholine or produce the effect of parasympathetic nerve stimulation are called as cholinergic agents or parasympathomimetic agents.

Uses:

Pilocarpine

1. Used in solutions of 1 to 5% as miotic to constrict pupil.
2. Decreases intraocular pressure in glaucoma
3. Used to counteract effects of short acting mydriatics on the eye.

Physostigmine:

1. Used as miotic



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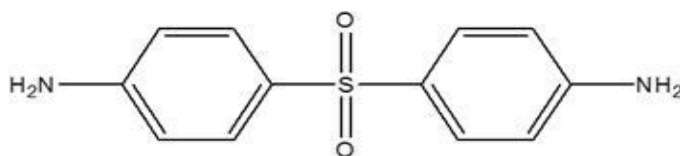
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2. Decreases intraocular pressure in glaucoma.
3. Used by injection to reverse toxic effects of anticholinergics
4. Used for the treatment of poisoning due to anticholinergics and Tricyclic antidepressants.

d) Give the structure, chemical name and uses of Dapsone.

(One mark each for structure, chemical name and uses)



Chemical Name: Bis (4-aminophenyl) sulphone OR 4,4' Diaminodiphenyl sulphone

Uses of Dapsone

1. Dapsone is used in combination with pyrimethamine in the treatment of malaria.
2. Dapsone is the principal drug used in the treatment of all forms of leprosy.
3. In addition to its use in leprosy, dapsone has been found of value in dermatitis herpetiformis and other dermatoses.

e) Enlist the uses of any three fat soluble vitamins. (01 mark each)

Ans: Fat soluble vitamins are: Vitamin A, Vitamin D, Vitamin E and Vitamin K.



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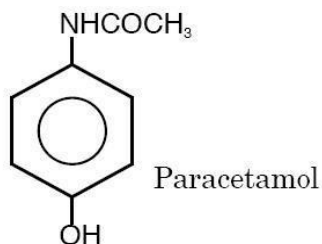
Uses:

Vitamin A:	Vitamin D:	Vitamin E	Vitamin K
<ul style="list-style-type: none">• For normal vision.• For treatment of night blindness and skin disorders.• Integrity of epithelial cells.	<ul style="list-style-type: none">• Bone formation.• Absorption of calcium and phosphorous from gastrointestinal tract and for their transport.• For prevention and treatment of rickets.	<ul style="list-style-type: none">• Antioxidant.• Used in prevention and treatment of vitamin E deficiencies.• Used in sterility, habitual abortion and muscular dystrophy.	<ul style="list-style-type: none">• Used to treat hemorrhage.• In treatment of hypoprothrombinaemia and hemorrhage caused by anticoagulant therapy.

f) Give the structure, chemical name and uses of Paracetamol.

(01 mark for each)

Ans: Structure of paracetamol



Chemical name: p-hydroxy acetanilide **OR** 4-hydroxy acetanilide
OR 4-Acetylamino phenol

Uses:

1. Antipyretic
2. Analgesics for relief of pain such as headache, toothache, neuralgia, rheumatism.



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Q. 4 Attempt any FOUR of the following. (4 x 3) (12 M)

a) Define and classify general anesthetics.

(01 mark for definition and 02 marks for classification)

Ans: Definition: General anesthetics are the central nervous system depressant drugs which bring about loss of all modalities of sensations along with a reversible loss of consciousness.

Classification:

1) Inhalation anaesthetics:-, which include the liquids of volatile nature and gaseous substances used by inhalation to produce anaesthesia. These may be sub-classified as follows:

i) Volatile liquids:

(a) Halogenated hydrocarbons: e.g. Chloroform, Halothane, Trichloroethylene, Ethylchloride

(b) Ethers : e.g. Diethyl ether, Vinyl ether

ii) Gases: e.g. Cyclopropane, Nitrous oxide

2) Intravenous anaesthetics:-

i) Barbiturates: Ultra short acting barbiturates e.g. Methohexitone, Thiopentone sodium

ii) Non-barbiturates:

a) Eugenol derivatives. E.g. Propanidid

b) Phencyclidine derivatives. e.g Ketamine

c) Steroids. e.g. Althesin

d) Miscellaneous. E.g. Etomidate, Propofol

b) Write the uses of (One mark each)

i) Congo red

ii) Indigo carmine

iii) Evans Blue



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Ans: i) Congo red Uses:

- Employed as a stain in diagnosis of amyloid disease.
- Used for detection of deposits in the tissue samples.

ii) Indigo carmine

Uses:

- It is administered intravenously to test renal function (by estimating the rate of excretion in urine) & to locate the urethral orifices.
- In the lab it is used as coloring agents

iii) Evans blue

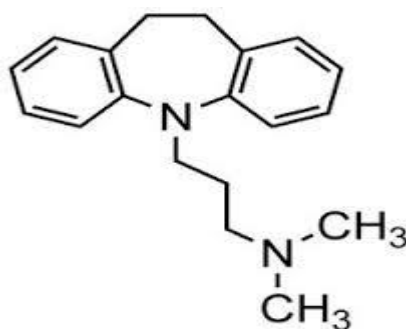
Uses:

- Evans Blue Dye is a di-azo compound and has been the principal method of determining blood volume in humans and animals.
- The dye combines firmly with plasma albumin when injected into the blood stream and leaves the circulation very slowly.

c) Draw structure; give uses and brand names of Imipramine.

(01 mark each for structure, uses and brand name)

Structure:



Uses:

1. Imipramine is mainly used in the treatment of major depression.
2. Imipramine is used in the treatment of depression, such as depression associated with anxiety.
3. It has marked sedative property.



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Brand names of Imipramine: Antidep, Depranil, Deprol, Prazep, Tofranil, Depsonil, Diamin, Depsol, Microdep.

d) Classify antibiotics according to chemical structure with examples. (03 marks)

Chemical Classification:

1. Beta lactam antibiotics – Penicillin , Cephalosporin, amoxicillin
2. Aminoglycoside antibiotics– Streptomycin, Gentamycin, neomycin
3. Polypeptide antibiotics – Bacitracin
4. Polyene antifungal antibiotics – Nystatin, Amphotericin
5. Macrolide antibiotics – Erythromycin
6. Tetracyclines –Tetracycline, Oxytetracycline, Chlortetracycline
7. Ansamycins- Rifampin, Rifamycin, Rifabutin.
8. Fluoroquinolones- Ciprofloxacin, Ofloxacin etc.
9. Miscellaneous –Griseofulvin, Chloramphenicol

e) Define antineoplastic drugs. Write the uses of cyclophosphamide and methotrexate.

(01 mark for definition and 1 mark for each uses)

Ans: Definition: Antineoplastic agents, also known as cytotoxic agents are used in the treatment of malignant diseases when surgery or radiotherapy is not possible or has proved ineffective.

Uses: Cyclophosphamide:

1. Used in treatment of solid tumours such as carcinoma of the breast, cervix, lung and ovary
2. Used in combination of other agents in the treatment of lymphomas, myeloma.



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3. Used as immunosuppressant in tissue and organ transplantation.
4. Used in the management of autoimmune disorders such as nephritic syndrome and rheumatoid arthritis.

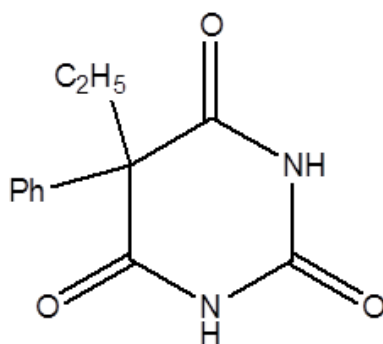
Methotrexate:

1. Used in the management of acute lymphoblastic leukemia
2. Used as immunosuppressant
3. Given by mouth or by injection as methotrexate sodium.

f) Define hypnotics? Give structure and chemical name of Phenobarbitone.

(01 mark each for definition, structure and chemical name)

Hypnotics: Hypnotics are drugs which induce sleep by depression of central nervous system and are used in cases of insomnia.



Chemical name: 5-ethyl, 5-phenyl barbituric acid.



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Q.5 Attempt any FOUR of the following:(4 x 3)

(12 M)

a) Define anticoagulants. Enlist two coagulants and two anticoagulants.

(01 mark to each sub question)

An **anticoagulant** is a substance that prevents coagulation; i.e. it stops blood from clotting. Anticoagulants are given to people to stop thrombosis (blood clotting inappropriately in the blood vessels).

Coagulants: Menadione or Vit. K, Thrombin

Anticoagulants: Heparin, Warfarin, Dicumarol, Phenindione.

b) Define and classify local anesthetics. Differentiate general anesthetics and local anesthetics.

[01 mark each to definition, classification and difference (any two points)]

Local anesthetics: Local anesthetics are drugs which on topical application or local injection causes reversible loss of sensory perception especially pain in restricted area of the body.

Local anesthetics classification:

1. Natural Products- Cocaine
2. Synthetic Compounds
 - a) Benzoic acid derivatives- Hexylcaine, Isobucaine
 - b) Para-amino benzoic acid derivatives- Benzocaine, Procaine
 - c) Meta amino benzoic acid derivatives- Orthoform
 - d) Amides- Lignocaine, Dibucaine
 - e) Miscellaneous- Benzyl alcohol, Clove Oil, Phenol etc.



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Difference between general anesthetics and local anesthetics (any two points)

Sr. No.		General anesthetics	Local anesthetics
1	Site of action	Central Nervous System (CNS)	Peripheral nerves
2	Area of body involved	Whole body	Restricted area
3	Consciousness	Lost	Not lost
4	Poor health patient	Risky	Safer
5	Use in non-cooperative patient	Possible	Not possible
6	Major surgery	Preferred	Not preferred
7	Minor surgery	Not preferred	Preferred
8	Care of vital organs	Essential	Usually not needed
9	Examples	Chloroform, diethylether, Thiopental sodium etc.	Benzocaine, Procaine, Lignocaine etc.



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c) What is epilepsy? Classify anticonvulsants with examples.

(01 mark to definition, 02 marks to classification)

Epilepsy is a group of neurological disorder characterized by brief episodes of loss or disturbance of consciousness with or without body movement (convulsions).

Classification:

1. Barbiturates: Phenobarbitone, Mephobarbitone, Metharbital
2. Hydantoin: Phenytoin, Mephenytoin
3. Oxazolidinediones: Trimethadione, Paramethadione
4. Succinimides: Ethosuximide, Phensuximide, Methsuximide
5. Benzodiazepines: Diazepam, Chlonazepam, Lorazepam, Nitrazepam
6. Miscellaneous: Carbamazepine, Valproic acid, Phenacemide, Pregabalin, Gabapentin.

d) Enlist different sex hormones in human body. Explain the role of sex hormone in body. Write uses of testosterone.

(01 mark to each sub question)

Sex hormones: Testosterone, Estrogen, Progesterone

Role of sex hormones: They influence development and maintenance of various biological processes which are associated with reproduction.

Uses of testosterone:

1. It is a main androgen formed in testes. It has both androgenic and anabolic activity.
2. Its primary use is as androgen replacement therapy in men at maturity age in case of testosterone deficiency.
3. It is useful in certain anemia, osteoporosis
4. It stimulate the growth of under grown boys
5. It is used to increase athletic performance and maintain muscle tone.



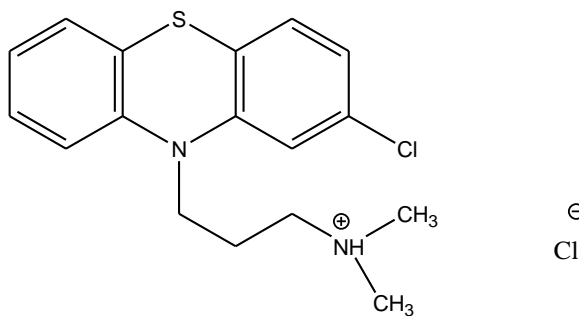
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- e) Give the structure, chemical name and uses of chlorpromazine hydrochloride.
(01 mark to each sub question)



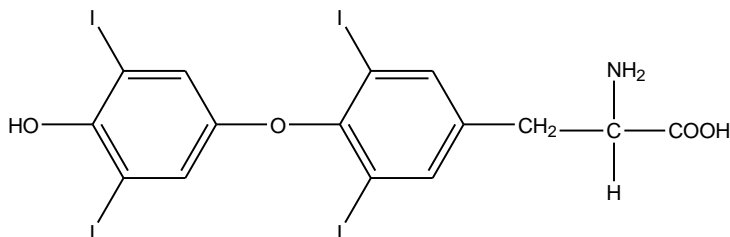
Chemical name: 2- Chloro-10-[3'-(dimethylamino)propyl] phenothiazine hydrochloride.

Uses:

1. It is used orally or IV for the treatment of psychosis and other mental disorders or disturbances.
2. Treatment of nausea and vomiting
3. It potentiates the effects of anesthetics, analgesics and sedative hypnotics.
4. Treatment of central and emotional disturbances.

- f) Define anti-thyroid drugs. Draw structure and give chemical name of Thyroxine.
(01 mark to each sub question)

Anti-thyroid drugs: These drugs are used in the treatment of hyperthyroidism i.e. excessive secretion of thyroid hormone from thyroid gland.





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Chemical name: 3,5,3',5' - Tetraiodo-thyronine.

OR O-(4-hydroxy-3,5-diiodophenyl)-3,5-diiodo-tyrosine

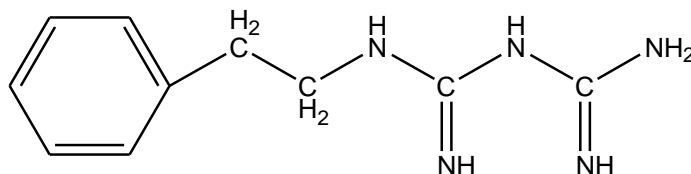
Q.6 Attempt any FOUR of the following: (4 x 4)

(16 M)

a) What is diabetes mellitus? Give structure and chemical name of Phenformin.

(1.5 marks each to explanation and structure, 01 mark to chemical name)

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia usually associated with polyphagia, polydipsia, polyurea, glycosurea, weight loss, dehydration etc. caused due to deficiency or diminished effectiveness of insulin (insulin resistance).

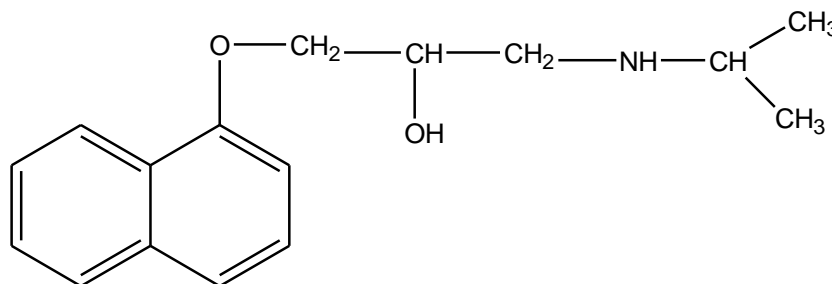


Chemical name: 1-Phenylethyl biguanide.

b) What are sympatholytics? Write structure and uses of Propranolol.

(01 mark to definition, 1.5 marks each to structure and uses)

Sympatholytics: The drugs which inhibit or antagonize the action of adrenaline and related drugs are known as sympatholytics or adrenergic antagonist.





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Uses of Propranolol:

1. It is a typical beta adrenergic receptor blocker used in the treatment of cardiac diseases like
 - i. Angina pectoris
 - ii. Cardiac arrhythmia
 - iii. Hypertension
 - iv. Congestive heart failure
 - v. Coronary atherosclerosis
2. Treatment of Pheochromocytoma
3. Treatment of tachycardia

c) Define and classify cardiovascular drugs.

(01mark to definition, 03 marks to classification)

Cardiovascular drugs: Cardiovascular drugs are used for their action on heart or on other parts of vascular system to modify the total output of heart or the distribution of blood to a certain part of circulatory system.

OR

Cardiovascular drugs are used in the treatment of various cardiac disorders like angina pectoris, hypertension, arrhythmia, myocardial infarction, congestive heart failure etc.

Classification:

1. Cardiotonic drugs (Positive inotropic effect): Digitalis, Cardiac glycosides
2. Antianginal drugs/ Vasodialators: Organic nitrates, Nitrites, glyceryl trinitrate
3. Antihypertensive drugs
 - a) Rauwolfia alkaloids- Reserpine
 - b) Ganglionic blockers- Hexamethonium chloride, guanethidine



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- c) Centrally acting drugs- methyl dopa
 - d) Alpha blockers- Prazocine, Phentolamine, Phenoxybenzamine
 - e) Beta-blockers- Propranolol, Atenolol, Metoprolol
 - f) Alpha+ Beta blockers- Labetolol
 - g) ACE (Angiotensin Converting Enzyme) Inhibitors- Captopril, Enalapril
 - h) Calcium channel blockers- Diltiazem, Verapamil, Nifedipine etc
 - i) Diuretics- Chlorthiazides, Frusemide
4. Antiarrhythmic drugs- Quinidine, Lignocaine, Amiodarone
5. Antihyperlipidemic drugs- (\downarrow blood CHL) : Clofibrate, Simvastatins, Atorvastatin etc.
6. Other drugs- Anticoagulants, hypoglycemic agents, thyroid hormones.
- d) Classify antimalarial drugs. Give structure, chemical name of Chloroquine.
(02 marks to classification, 01 mark each to structure and chemical name)**

Classification:

1. Cinchona alkaloids: Quinine
2. 4-amino quinolines: Chloroquine, Amodiaquine, Santaquin
3. 8- Amino quinolines: Primaquine, Pentaquine, Isopentaquine
4. 9-Amino acridines: Quinacrine
5. Pyrimidines: Pyrimethamine, Trimethoprim
6. Biguanides: Proguanil, Cycloguanil
7. Sufonamides and sulfone: Sulfadoxin, Dapsone
8. Artemisinin derivatives: Artesunate, Artemether.
9. Miscellaneous: Tetracycline, Doxycycline.

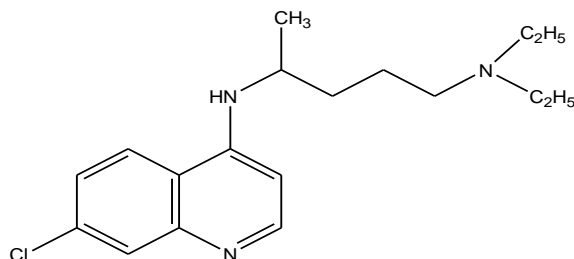


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Chemical name: 7-Chloro-4-[4'-(diethylamino)-1-methyl butyl] amino quinoline

e) Define and classify antihistaminic drugs. Draw structure of Chlorpheniramine.

(01 mark to definition, 02 marks to classification and 01 mark for structure)

Antihistaminic drugs: These agents are used in the treatment of symptoms like sneezing, dermatitis, urticaria, rhinorrhea etc. caused due to histamine release. They inhibit the action of histamine on H1 receptors. H2 receptor blockers are used in the treatment of stomach ulcer, gastric ulcer, heart burn etc.

Classification:

H1 receptor blockers:

1. Ethanolamines- Diphenhydramine, Doxylamine
2. Ethylenediamines- Mepyramine, Tripelenamine, Pyrilamine
3. Propylamines- Pheniramine, Chlorpheniramine
4. Piperazines- Cyclizine, Chlorcyclizine, Meclizine
5. Phenothiazines- Promethazine, Trimeprazine
6. Dibenzocycloheptenes- Cyproheptadine, Azatadine
7. Second generation antihistaminics- Cetrizine, Levocetizine, Fexofenadine, Terfenadine

H2 receptor blockers:

Ranitidine, Cimetidine, Famotidine, Nizatidine etc.



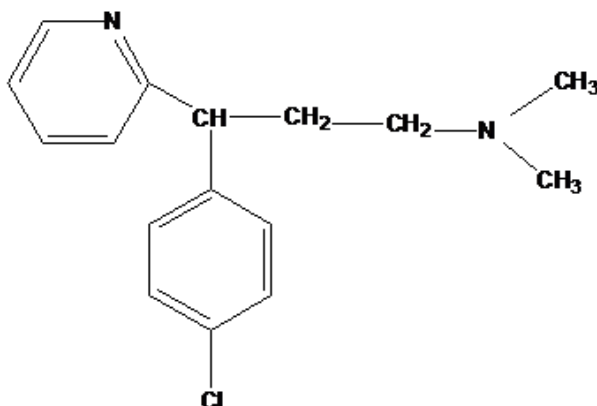
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Structure of Chlorpheniramine-



- e) **What are diuretics? Classify diuretics with examples. Draw structure of Frusemide.**
(01 mark to definition, 02 marks to classification and 01 mark to structure)

Diuretics: The drugs which increase the rate of formation & excretion of urine through kidneys are called as diuretics. They increase the excretion of sodium ion and other ions along with water by decreasing its reabsorption.

Classification:

- 1] Water & Osmotic diuretic. E.g. mannitol and urea
- 2] Carbonic anhydrase inhibitors (sulfonamides). E.g. Acetazolamide, methazolamide
- 3] Acidifying drugs. E.g. ammonium chloride.
- 4] Mercurial agents. E.g. Mercaptomerin
- 5] Thiazides diuretics. E.g. Chlorothiazide, chlorothalidone, Hydrochlorothiazide
- 6] Miscellaneous
 - K- sparing diuretics- e.g. Triamterene, amiloride
 - Aldosterone antagonist- e.g. Spironolactone
 - High ceiling diuretics/ Loop diuretics
 - E.g. Furosemide, Ethacrynic acid



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OR

1. Water & Osmotic agents-
 - Electrolytes:-Sodium & Potassium salts
 - Non electrolytes:- Mannitol, Urea
2. Organic mercurials:- Mersalyl acid
3. Acidifying agents:-Ammonium chloride, Arginine hydrochloride
4. Alpha-beta unsaturated ketones:- Ethacrynic acid
5. Purines & related compound: Caffeine
6. Sulphonamides:-
 - Carbonic anhydrase inhibitors-e.g. Acetazolamide
 - Benzothiazines: - Chlorthiazide, Hydrochlorothiazide
 - Sulphamoyl benzoic acid derivatives e.g. Furosemide
9. Endocrine antagonists: (aldosterone antagonists) e.g. Spironolactone
10. Miscellaneous agents: - Triamterene

OR

1. Weak diuretics
 - Osmotic diuretics- Urea, sodium and potassium salts
 - Non electrolytes- Mannitol, Glucose
 - Carbonic Anhydrase Inhibitors - Acetazolamide, Methazolamide,
 - Xanthine derivatives- Caffeine, Theophylline, Theobromine
2. Moderately potent diuretics: Chlorothiazides, Hydrochlorothiazide, Benzothiazides
3. Very potent/ loop/ high ceiling diuretics: Frusemide, Ethacrynic acid
4. Potassium sparing diuretics: Triamterene, Amiloride, aldosterone blocking agents- Spironolactone
5. Antidiuretic hormone : Lithium salts
6. Miscellaneous: Ammonium chloride, Calcium chloride



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Structure of Frusemide:

