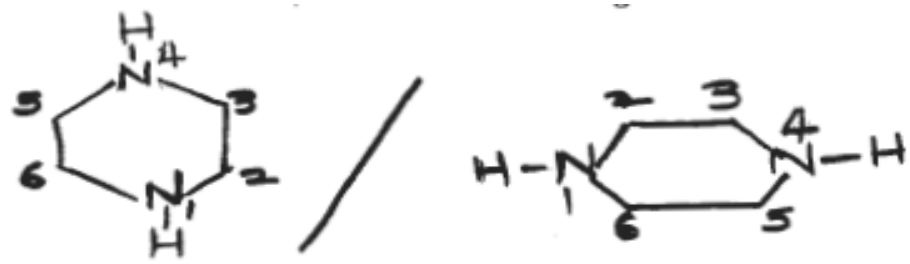
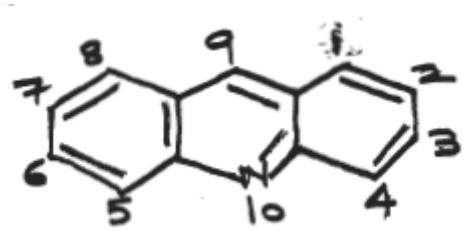
Q1. Each anwer carries 02 marks.

a] 01/2 mark for each structure & 01/2 mark for numbering method .

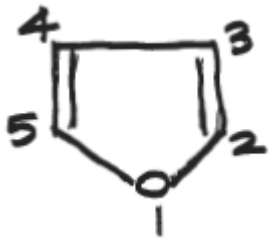
i] Piperazine



ii]Acridine

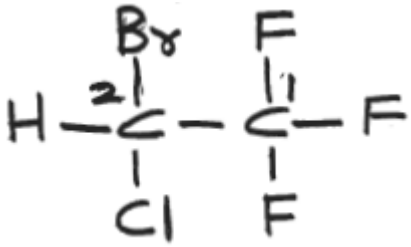


iii] Furan

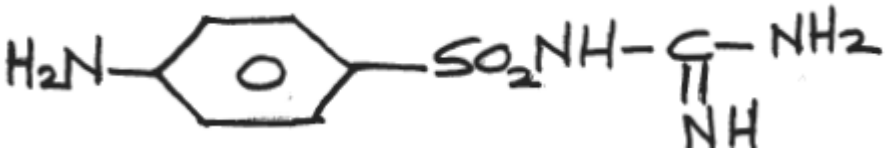


b] 01 mark for each structure.

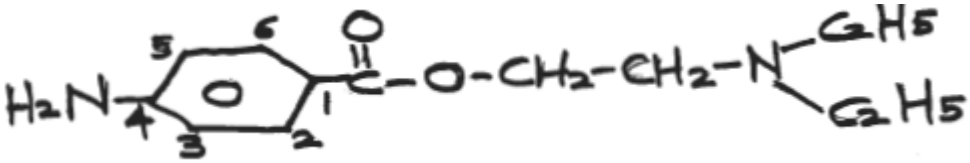
i] 2-Bromo-2-Chloro-1,1,1-Trifluoroethane.



ii]N1-Guanidinyl sulphanilamide.

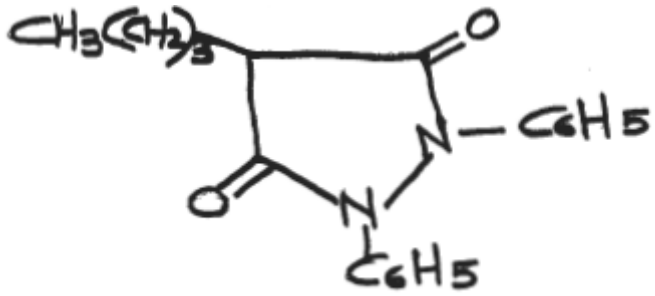


iii]2-diethylaminoethyl-4-aminobenzoate.



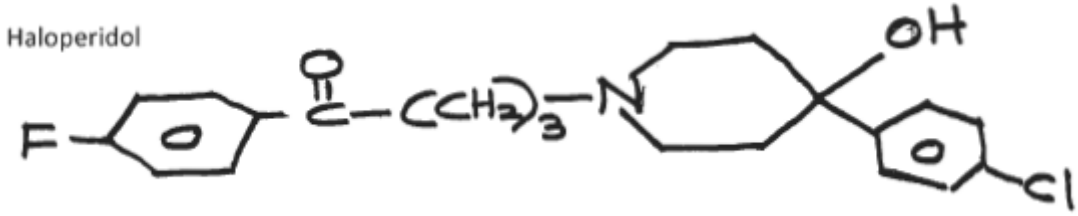
C] 01/2 mark for each structure & 01/2 mark for name of drug.

i] Phenylbutazone contains pyrazolidine ring.

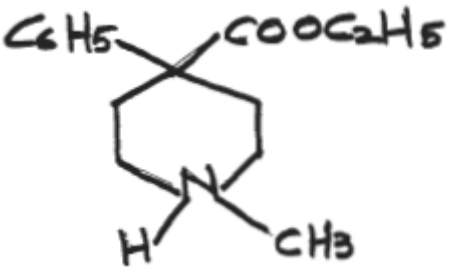


ii]Haloperidol & Pethidine contain Piperidine ring.

Haloperidol

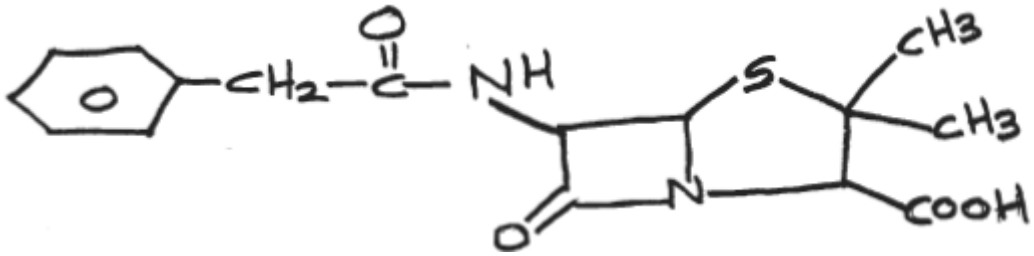


Pethidine

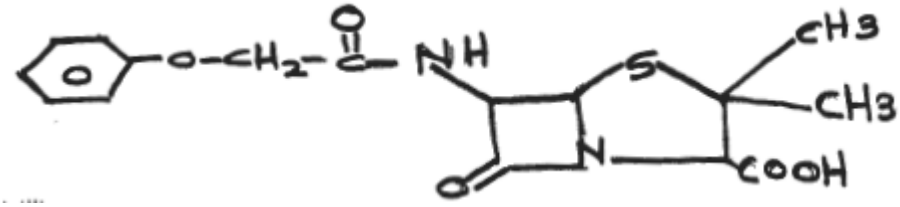


iii] Penicillin G, Penicillin V & Ampicillin contain Penicillanic acid

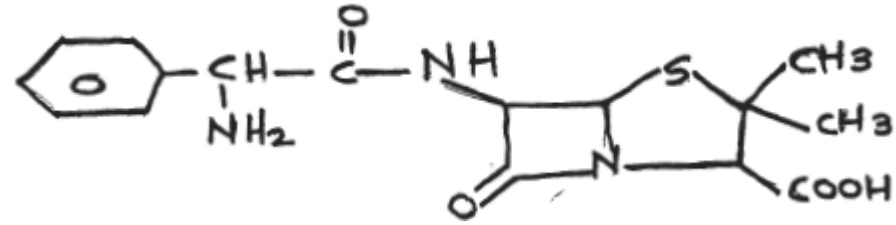
Penicillin G



Penicillin V



Ampicillin



D] 01 mark for each definition.

i]Antibiotics:- Antibiotics can be defined as substances obtained from or produced from living microbes & their synthetic analogues used for inhibiting the growth of or killing the microbes in low concentration.

ii] Antiarrhythmics:- Drugs used to correct irregular beating of the heart are antiarrhythmics. They bring about a depressant effect on the heart & reduce cardiac activity. They prolong the refractory period of the cardiac muscles & reduce the rate of successive contractions of the heart.

iii] Antipyretics:- Drugs used to decrease the elevated body temperature are antipyretics.

E] 01/2 mark for each brand name.

i] ibuprofen:- brufen, combiflam, bren, ibuflamar, tabalon.

ii] Diazepam:-calmpose, valium, placidox, anaxol.

iii] Betamethasone:-betacortil, solubet.

F]] 01 mark for each answer.

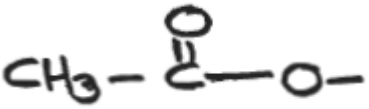
i] Nystatin: tablets, oral suspension.

ii] Zinc undecylenate: topical dusting powders, creams.

iii] Tolnaftate: topical solutions.

G] 01 mark for each structure.

i. Vinyl

ii. Acetyloxy 

iii. Diphenylamino 

H] 01/2 mark for each vitamin.

Fat soluble vitamins are vitamin A, vitamin D, vitamin E, Vitamin K.

I] The local anesthetics can be classified as follows:-

COCAINE & RELATED COMPOUNDS. e.g. cocaine, tropocaine

ESTERS. 1]Esters of benzoic acid e.g. hexylcaine hydrochloride, cyclomethycaine sulphate, proximethacaine hydrochloride.

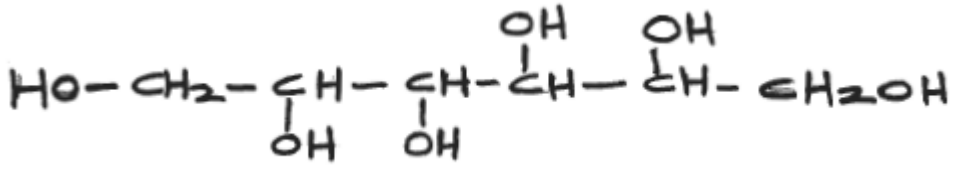
2]Esters of p-aminobenzoic acid e.g. benzocaine, procaine hydrochloride ,tetracaine hydrochloride ,amethocaine hydrochloride , butacaine sulphate.

AMIDES. e.g. lignocaine hydrochloride, prilocaine hydrochloride, bupivacaine hydrochloride , cinchocaine hydrochloride .

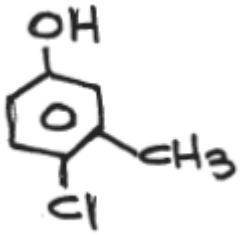
MISCELLANEOUS. e.g. Phenacaine hydrochloride, dicyclomine hydrochloride ,clove oil.

J] 01 mark for each structure.

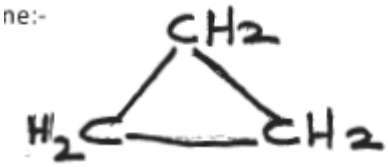
i. Mannitol:-



ii.Chlorocresol:-



iii. Cyclopropane:-



K] 01 mark for each drug.

i. Asthalin: Salbutamol.

ii. Althrocin: Erythromycin.

iii. Crocin: Paracetamol.

L] 01 mark for each answer.

i. Sulphobromophthalein Sodium : Given in the ratio of 5mg per kg body weight intravenously to test hepato-biliary function.

ii. Congo red: Employed as a diagnostic aid in amyloidosis. Also used as an indicator in lab.

iii. Evans blue: Evans Blue is a diazo compound and has been the principal method of determining blood volume in humans and animals for over eighty years. The dye combines firmly with plasma albumin when injected into the blood stream and leaves the circulation very slowly.

Q2. Each answer carries 03 marks.

A] ANTISEPTICS & DISINFECTANTS(01 mark):- definition Antiseptics are the agents that are used on living tissues & act as antimicrobial but donot kill them necessarily. Disinfectants are agents which are applied on inanimate objects & kill the microbes outright.

CLASSIFICATION(02 marks)

1)ALCOHOLS & ALDEHYDES E.g. ALCOHOL, FORMALDEHYDE

2)HALOGEN COMPOUNDS. E.g.CHLORAMINE T, CHORHEXIDINE ACETATE, DIBROMOPROPAMIDINE ISOTHIONATE.

3)PHENOLS & RELATED COMPOUNDS. E .g. PHENOL, CHLOROCRESOL, CHLOROXYLENOL, CRESOL, HEXACHLOROPHENE, THYMOL.

4)MERCURY COMPOUNDS. E.g. MERBROMIN(mercurochrome), THIOMERSAL.

5)DYES. E.g. AMINACRINE HYDROCHLORIDE, PROFLAVINE HEMISULPHATE, ACRIFLAVINE, BRILLIANT GREEN, CRYSTAL VIOLET(GENTIAN VIOLET), METHYLENE BLUE.

6) SURFACE ACTIVE AGENTS E.g. BENZALKONIUM CHLORIDE, CETRIMIDE, CETYLPYRIDINIUM CHLORIDE, DOMIPHEN BROMIDE, OCTAPHONIUM CHLORIDE.

7) MISCELLANEOUS AGENTS. E.g. DEQUALINUM SULPHATE , NITROFURAZONE.

B] 01 mark for name, 01 mark for structure & 01 mark for properties.

Sulphacetamide sodium is used for eye infection.

Structure of sulphacetamide sodium

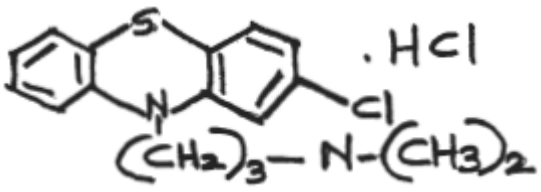
Properties of sulphacetamide sodium:-it is a white to yellowish white, crystalline powder, highly soluble in water, slightly soluble in alcohol & insoluble in chloroform, aqueous solutions are alkaline in nature, incompatible with all acidic substances.

C] 01 mark for explaining hypertension, 02 marks for naming drugs(any four.)

Hypertension:-when the blood pressure is increased from the normal value of 80-120mm of mercury, the condition is called hypertension. There are number of factors that are responsible for causing hypertension. When the blood pressure is simply increased without any harmful effect on the organs, it is called primary hypertension. When the blood pressure is very high, it causes damaging effects on other organs & impairs their functions. This is called secondary or malignant hypertension.

Drugs used for hypertension are reserpine, methoserpidine. guanethidine sulphate, bethanidine sulphate, pentolinium tartarate, mecamylamine hydrochloride, hydralazine hydrochloride, methyldopa, clonidine hydrochloride, diazoxide, prazosin hydrochloride, pargyline hydrochloride & some of the beta- adrenergic blocking drugs.

D] 01 mark for structure, 01 mark for properties & 01 mark for uses.



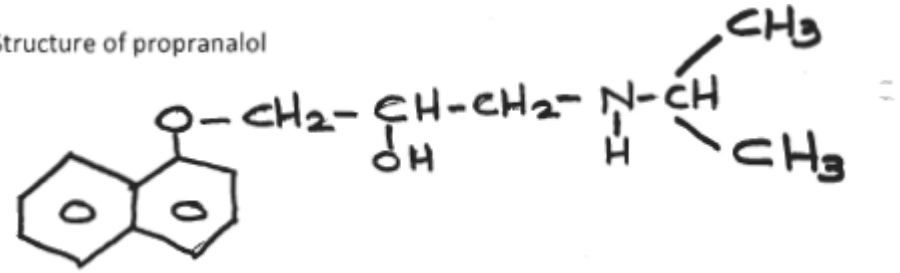
Chlorpromazine hydrochloride structure.

Properties:-it is a white crystalline powder & is soluble in water & alcohol. Aqueous solutions are stable to heat.

Uses:- used in the treatment of anxiety, tension, agitation, emotional disturbances & in lessening motor activity both in psychoneurotic & psychotic conditions. Also finds use in treatment of nausea & vomiting.

E] 01 mark each for structure, properties & uses.

Structure of propranalol



Properties:- it is a white crystalline solid & is odourless, soluble in water, alcohol & slightly soluble in chloroform & other non-polar solvents.

Uses:- used as beta adrenergic blocking drug in treatment of angina pectoris, cardiac arrhythmias .

F] 01 mark each for definition, properties & uses.

Cholinergic drugs:-are drugs that have the same effects as that of acetylcholine or produce these effects due to stimulation of parasympathetic nerves .Acetylcholinesterase inhibitors can also be included under this category.

Properties of neostigmine:-it is a white crystalline powder with bitter taste & soluble in water & less soluble in alcohol, it is hygroscopic & aqueous solutions are neutral to litmus.

Uses of neostigmine:- used parenterally for the treatment of paralytic ileus, post operative urinary retention , in the diagnosis & treatment of myasthenia gravis.

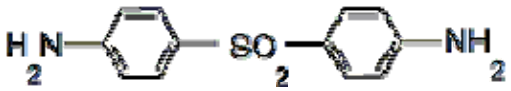
Q.3 Attempt any Four of the following :

A) Write structure, properties and Uses of Dapsone.

(Each question bit carries 1 mark each)

Ans : Dapsone is an antileprotic agent belonging to a group of Sulphones.

Structure:



Properties:

1) It is a white or creamy-white, crystalline powder a slightly bitter taste.
2) It is very slightly soluble in water.

Uses:

1) Dapsone is bacteriostatic against a wide range of bacteria but is mainly employed for its action against *Mycobacterium leprae*.
2) Its mechanism of action is probably similar to that of sulphonamides since they both have similar range of antimicrobial activity and both are antagonised by *p*-aminobenzoic acid.
3) Dapsone is the principal drug used in the treatment of all forms of leprosy.
4) It is given by mouth.
5) It may also given by intramuscular injection.
6) In addition to its use in leprosy, dapsone has been found of value in dermatitis herpetiformis and other dermatoses.
7) It has suppressive action on malarial plasmodia and is used in conjunction with other antimalarials.

B) What is DEC? Write properties and uses of DEC.
(Each question bit carries 1 mark each)

Ans : DEC is the abbreviation used for an antifilarial agent **Diethylcarbamazine.**

Properties of citrate salt of Diethylcarbamazine :

1) It a white cryastalline powder.
2) Very soluble in water.
3) The base (diethylcarbamazine) is precipitated by an alkali and alkaline substances.
4) It is active orally and is absorbed well from the g.i.tract.

Uses:

1) This drug is categorised as an anthelmintic, particularly antifilarial agent.
2) It is used to treat filariasis particularly when due to *W.bancrofti or Loa loa.*
3) It has also been used in the treatment of tropical eosinophilia.

4) It is usually administered by mouth as tablets.

C) Classify General Anaesthetics by two different methods giving suitable examples.
(Each question bit carries 1 mark each)

Ans: General anaesthetics are the CNS depressants which produce loss of all modalities of sensation, particularly pain along with total and reversible loss of consciousness and are used to produce anaesthesia before a surgical operation, or in obstetrics. General anaesthetics can be classified based on their mode of administration as follows:

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) Intraveneous anaesthetics:

i) Barbiturates: Ultra short acting barbiturates such as Methohexitone, Thiopentone sodium

ii) Non-barbituates:
- a) Eugenol derivatives e.g. Propanidid
- b) Phencyclidine derivatives e.g Ketamine
- c) Steroids e.g. Althesin
- d) Misc. such as Etomidate, Propofol

Another method of classifying General anaesthetic agents actually overlaps with the first method of classification depicted above. General anaesthetics may be classified based on the physical nature and properties of the substances as:

1) Volatile General anaesthetics
- **i) Liquids**:
  - a) Halogenated hydrocarbons eg. Chloroform, Halothane, Trichloroethylene, Ethylchloride
  - b) Ethers: e.g. Diethyl ether, Vinyl ether
- **ii) Gases**: e.g. Cyclopropane, Nitrous oxide

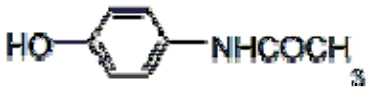
2) Non-volatile general anaesthetics
- **i) Barbiturates**: Ultra short acting barbiturates such as Methohexitone, Thiopentone sodium
- **ii) Non-barbituates:**
  - a) Eugenol derivatives e.g. Propanidid
  - b) Phencyclidine derivatives e.g Ketamine
  - c) Steroids e.g. Althesin
  - d) Misc. such as Etomidate, Propofol

Apart from the above compounds, some slower acting drugs such as Diazepam (a benzodiazepine), Fentanyl (a short acting opioid analgesic related to pethidine)etc. are now frequently used for inducing, maintaining and supplementing general anaesthesia.

D) Give structure, chemical name and stability storage conditions of paracetamol.
(Each question bit carries 1 mark each)

Ans :

Structure:



Chemical Name: N-acetyl-p-aminophenol; 4-hydroxyacetanilide

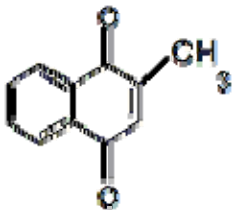
Stability storage conditions: Reasonably stable to heat, light and moisture. Should be stored in well closed containers, protected from light.

E) Define coagulants and anticoagulants. Draw structure of Menadione.
(Each question bit carries 1 mark each)

Ans: **Coagulants** are the agents which help and bring about coagulation of blood.
Vascular defects, platelet defects or plasma coagulation disorders, low prothrombin concentration caused by anticoagulant therapy etc result in haemorrhagic condition. Coagulants are employed in the treatment of severe haemorrhage.

Anticoagulants: Anticoagulants are the drugs which prolong the coagulation time of blood.
They are used prophylactically and therapeutically in the treatment of a no. of clinical conditions like thrombo-embolic occulsive vascular diseases such as venous thrombosis, pulmonary embolism and cardiac infarction. They are also used to prevent thrombosis during and after surgical operation; during blood transfusion process and in preservation during the storage of blood in blood banks.

Menadione:
Structure:



F) Classify Diuretics giving suitable examples of each class.
(Classification – 3 marks)

Ans : Diuretics are the agents which promote excretion of water and electrolytes by the kidney. In other words, diuretics increase the urinary output of ions and fluid from the kidneys.

Classification:

1. **Water and osmotic diuretics:**
   a) Electrolytes eg. Sodium and Potassium salts
   b) Non-electrolytes eg. Mannitol, Urea, Sucrose
2. **Acidifying agents**: e.g. Ammonium chloride, Arginine hydrochloride
3. **Organic mercurials** : e.g. Mersalyl acid
4. **Alpha-beta unsaturated ketones** eg. Ethacrynic acid
5. **Purines and related compounds** eg. Caffeine
6. **Sulphonamides:**
   a) Carbonic anhydrase inhibitors eg. Acetazolamide
   b) Benzothiadiazines eg. Chlorthiazide, Hydrochlorthiazide
   c) Sulphamoyl benzoic acid derivatives eg. Furosemide
7. **Endocrine antagonists (aldosterone antagonists)** eg. Spironolactone
8. **Miscellaneous agents:** e.g. Triamterene

Diuretics can also be classified therapeutically as follows:

1) **Weak diuretics**:
   a) Osmotic diuretics: Sodium and Potassium salts
   b) Xanthine derivatives such as aminophylline
   c) Carbonic anhydrase inhibitors such as acetazolamide

2) **Moderately efficacious diuretics:**
   a) Osmotic diuretics such as mannitol, sucrose and glycerol
   b) Benzothiadiazines and related compounds such as chlorthalidone, chloroxozone and clopamide

3) **Very efficacious diuretics (High ceiling diuretics)** e.g. furosemide, ethacrynic acid

4) **Potassium sparing diuretics:**
   a) Aldosterone antagonists : Spironolactone
   b) Renal epithelial sodium channel inhibitors: Triamterene and amiloride

Q.4 Attempt ant Four of the following :

A) Define and classify Antineoplastic drugs with examples.
(Definition – 1 mark; Classification – 2 marks)
Ans: Antineoplastics:
The drugs useful in the treatment of cancer are called Antineoplastic agents.
Neoplasm [Neo-New and Plasm- Form] is the medical term for cancer or tumour which means a relatively autonomous growth of tissue. Cancerous tumour is a malignant tumour of potentially dangerous nature.

Classification:

1) **Alkylating agents**: e.g. Cyclophosphamide, Mustine, Thiotepa, Lomustine, Busulphan, Chlorambucil
2) **Antimetabolites**: e.g. Methotrexate, Mercaptopurine, Azathioprine, Flurouracil
3) **Antibiotics**: e.g. Actinomycin, Daunorubicin, Mitomycin, Bleomycin
4) **Plant products** : e.g. Vinblastine, Vincrystine
5) **Hormones and related compounds**: e.g. Adrenocorticosteroids, Tamoxifen
6) **Miscellenous agents**: e.g. Hydroxyurea, Cisplatin

B) Define Cardiotonics and write hydrolysis products of cardiac glycosides.
(Definition – 1 mark; Hydrolysis products 2 marks)

Ans: Cardiotonics are the agents which have a stimulating action on cardiac muscles. They increase the force of contraction of heart (positive inotropic action) without increasing the oxygen consumption. They are used in the treatment of congestive cardiac failure (CCF).

Digitalis, Stropanthus and Squill are certain plants containing cardiac glycosides. These are the glycosides possessing cardiotonic activity. These glycosides on hydrolysis, yield corresponding aglycones and sugars. The cardiac activity of these glycosides resides in the aglycone moiety whereas the sugar residue provides favourable solubility and distribution characteristics. Digitoxin, Digoxin are some of the examples of cardiac glycosides.

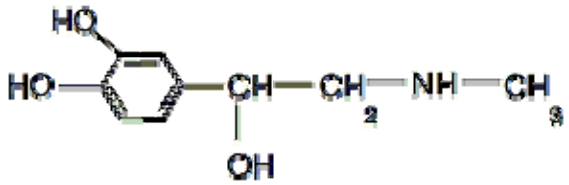
The hydrolysis products of these are as follows:

Cardiac glycoside	Sugar moiety	Aglycone moiety
Digitoxin	3 molecules of Digitoxose	Digitoxigenin
Digoxin	3 molecules of Digitoxose	Digoxigenin
Lantoside C	(i) two molecules of Digitoxose; (ii) one molecules of acetyl digitoxose (iii) one molecule of D-glucose	Digoxigenin

C) What are Adrenergic drugs? Draw structure and uses of Adrenaline.
(Each question bit carries 1 mark each)

Ans: Adrenergic drugs: Nor adrenaline is the indogeneous neurotransmitter at the postganglionic sympathetic nerves. Adrenergic agents are the drugs that mimic the responses obtained as a result of stimulation of sympathetic or adrenergic nerves.

Structure of adrenaline:



Uses of adrenaline:

Adrenaline acts on smooth muscle cells, gland cells and heart to produce responses like those produced by stimulation of corresponding sympathetic nerves.

Adrenaline stimulates heart, increases B.P, relaxes smooth muscles of intestine and of bronchi.

1. Used to relieve bronchial spasms in asthma.
2. Topically it is applied to control superficial haemorrhages in operative procedures on nose and throat.
3. Because of its nasal decongestant action, it is used in allergic cold conditions, such as acute coryza, hay fever and sinusitis.
4. Used in combination with local anaesthetic because of its vasoconstrictor action where it keeps local anaesthetic in required area and thus prolongs the action of local anaesthetic.
5. Adrenaline is highly valuable in complete heart block where it can serve to be a life saving drug.
6. It is also useful in a no. allergic conditions and gives relief in severe conditions like anaphylactic shock, serum sickness and giant urticaria.

D) What are Sex Hormones? Give properties and uses of Testosterone.
(Each question bit carries 1 mark each)

Ans: Sex hormones are the hormones which are produced mainly in gonads, ovaries or testes. They influence the development and maintenance of the structures directly and indirectly associated with reproduction.

Testosterone: is the main androgen formed in the testes.

Properties:

1) It occurs as white crystalline powder
2) It is practically insoluble in water
3) Soluble in fixed oils
4) It is incompatible with oxidising agents
5) It should be protected from light

Uses:

1. The primary use of androgens and anabolic agents is as androgen replacement therapy in men, either at maturity or in adolescence. The cause of testosterone deficiency may either be hypogonadism or hypopituitarism.

2. The use of androgen and anabolic agents for their anabolic activity, or for uses other than androgen replacement, has been very limited due to their masculinising actions. This greatly limits their use in women and children.

3. Androgens in low doses are sometimes used in the treatment of dysmenorhoea and postpartum breast enlargement.

4. Androgens and anabolic agents are also used to treat certain anemias, osteoporosis and to stimulate growth in post puberal boys. However, in all cases, use of these agents requires caution.

E) Classify Cardiovascular drugs with suitable examples from each class.
(Classification – 3 marks)

Ans: Cardiovascular agents include various types of drugs having an action on the heart or on other parts of the vascular system and they have the ability to alter cardiovascular function.

Classification:

Different kinds of drugs fall under this category like :

1) **Cardiotonics** (Positive cardiac inotropic agents- they increase the force of contraction of the myocardium)e.g. Cardiac, glycosides obtained from Digitalis, Stropanthus squill such as Digoxin, Digitoxin, Lanatoside C etc.

2**) Antiarrhythmic** drugs: used to regulate arrhythmic (irregular) beating of the heart

a) Membrane-stabilizing agents which block fast inward current of Na^+ irons into cardiac cells. They also have local anaesthetic activity e.g. Quinidine, Procainamide, Disopyramide, Phenytoin etc.
b) Drug causing β-adrenergic blockade e.g. propranalol and others
c) Drug that prolong the duration of cardiac action potential e.g. Amiodarone
d) Calcium channel blockers : e.g. verapamil

3**) Antianginal agents** which are used in the treatment of angina pectoris, enabling the heart to meet its metabolic demands for oxygen:

a) Organic nitrates e.g. Amyl nitrate, Isosorbidnitrate
b) Calcium-channel blockers e.g Verapamil
c) β-adrenergic blockers e.g. Propranolol

4) **Anti-hypertensives** which regulate the blood pressure

a) Centrally acting agents: e.g. α-methyldopa, clonidine
b) Ganglion blockers : e.g. Pentolinium, Mecamylamine
c) Adrenergic neurone blockers e.g. Reserpine, Guanethidine
d) β-adrenergic blockers e.g. Propranalol, Atenolol
e) α-adrenergic blockers e.g. Prazosin, Tolazoline
f) Direct-acting vasodilators e.g. Hydralazine, Minoxidil
g) Calcium channel blockers eg. Verapamil
h) Angiotensin converting enzyme inhibitors (ACE, inhibitors) e.g. Captopril

5) **Antihyperlipidemic agents**: (lipid lowering agents) e.g Clofibrate, Nicotinic acid

6) **Antithrombotics** eg. Urokinase

7) **Anticoagulants** eg. Heparin

8) **Antiplatelet drugs** eg. Aspirin

9) **Diuretics** (used as adjuvant to antihypertensive therapy) eg. Thiazides, Furosemide

F) Classify Non-steroidal Anti-Inflammatory drugs and draw structure of Indomethacin.
(Classification – 2 marks; Chemical structure – 1 mark)
Note: Classes B and C may be considered to be optional.

Ans : NSAIDs is an abbreviation for a group of agents called Non steroidal anti inflammatory drugs.
These are actually the analgesics which while providing relief from pain do not cause significant depression of CNS.
In addition to analgesic effect, these agents also possess anti-inflammatory activity, reduce elevated body temperature (anti-pyretic effect) and also possess uricosuric effect. Some of these also have antiplatelet activity. These agents are non addicting. Moreover, unlike narcotic analgesics, these agents do not possess steroidal skeleton in their structure.
During inflammation, pain and fever, arachidonic acid is liberated from phospholipid fraction of cell membranes. Arachidonic acid is converted via the enzymes cyclooxygenase (COX-1 and COX-2) to Prostaglandins (PGs). PGs sensitise blood vessels to the effects of other inflammatory mediators that increase permeability of the vessels and are responsible for causing hyperalgesia associated with inflammation, causing pain and pyrexia.

Classification:

A. Nonselective COX inhibitors (conventional NSAIDs)

i. Salicylates: Aspirin, Diflunisal
ii. Pyrazolone derivatives: Phenylbutazone, Oxyphenbutazone
iii. Indole derivatives: Indomethacin, Sulindac
iv. Propionic acid derivatives: Ibuprofen, Naproxen, Ketoprofen, Flurbiprofen
v. Anthranilic acid derivatives: Mephenamic acid
vi. Aryl-acetic acid derivatives: Diclofenac
vii. Oxicam derivatives: Piroxicam
viii. Pyrrolo-pyrrole derivative: Ketorolac

B. Preferential COX-2 inhibitors

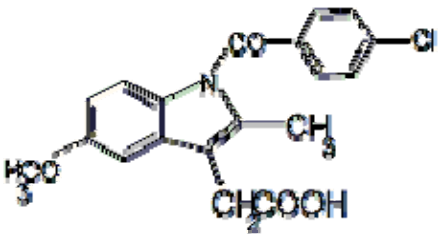
Nimesulide, Meloxicam, Nabumetone

C. Selective COX-2 inhibitors

Celecoxib, Rofecoxib, Valdecoxib

D. Analgesic-antipyretics with poor anti-inflammatory action

i. Para amino phenol derivatives: Paracetamol (Acetaminophen).
ii. Pyrazolone derivatives: Metamizol (Dipyrone), Propiphenazone
iii. Benzoxazocine derivatives: Nefopam

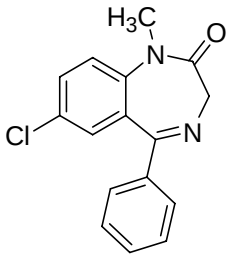


Q.5 Attempt any FOUR of the following. (Each question will carry THREE marks)

a) Write structure, uses and official preparations of Diazepam.

Ans.- (Each sub bit will carry one mark)

Diazepam structure:



Diazepam uses:

1. To control stress and anxiety
2. Management of acute agitation due to alcohol withdrawal
3. Treatment of convulsions
4. Its derivative oxazepam has sedative and muscle relaxant action, hence control muscle spasm
5. To calm the patient in minor surgery, endoscopy and dentistry

Official preparations:

1. Diazepam tablets I.P., B.P.
2. Diazepam capsules I.P., B.P.
3. Diazepam injection I.P., B.P.C.
4. Diazepam elixir B.P.C.

b) Define and classify anticonvulsants with examples

Ans.- (Definition will carry One mark and Classification will carry Two marks)

Anticonvulsant- Definition:

The drugs which are used in the prevention and control of epileptic seizures called as anticonvulsant drugs.

1. Barbiturates- Phenobarital, Mephobarbital, Metharbital
2. Hydantoins- Phenytoin, Mephenytoin
3. Oxazolidinedions- Trimetadione, Paramethadione
4. Succinimides- Phensuximide, Methsuximide
5. Benzodiazepines- Diazepam, Clonazepam
6. Miscellaneous- Carbamazepin, Valproic acid, Phenacemide etc.

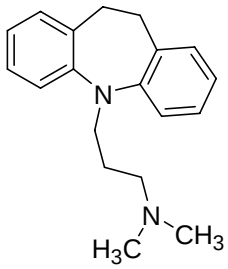
c) Define antidepressants and give structure and properties of Imipramine HCl.

Ans.- (Each sub bit will carry one mark)

Antidepressants- Definition:

Antidepressant drugs are psychiatric medicines that relieve symptoms of depressive disorders like tension, anxiety, etc.

Imipramine HCl Structure –



Properties of Imipramine-

1. Imipramine HCl occurs as white or slightly yellow, crystalline powder.
2. It is almost odorless with bitter taste
3. It is freely soluble in water, alcohol, choloform and acetone and practically insoluble in ether
4. On exposure to light it acquires reddish color.

d) Define and classify Cholinergic antagonists

Ans.- (Definition will carry one mark and Classification will carry Two marks)

Cholinergic antagonists Definition-The drugs which block the action of Acetylcholine on autonomic nervous system or central nervous system through muscarinic and nicotic receptors are called as cholinergic antagonists.

Classification of Cholinergic antagonists-

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

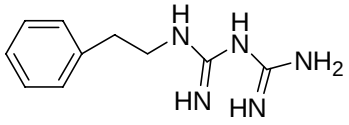
e) Classify hypoglycemic drugs with examples. Draw structure of Phenformin OR Chlopropamide

Ans.- (Classification will carry Two marks and any one structure will carry one mark)

Classification of hypoglycemic drugs-

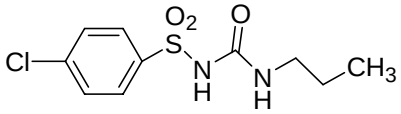
1. Parenteral Hypoglycemics (Insulins)
    a) Short acting Insulin- Neutral or Plain Insulin
    b) Intermediate acting Insulins- Isophane Insulin (NPH), Lente Insulin
    c) Longer acting Insulins- Ultralente Insulin
2. Oral hypoglycemic
    a) Sulfonylureas- Tolbutamide, Chlorpropamide, Glipizide, Glibenclamide etc.
    b) Biguanides- Phenformin, Metformin
    c) Thiazolidinediones- Rosiglitazone, Pioglitazone
    d) Miscellaneous- Acarbose, Miglitol

Phenformin Structure-



OR

Chlorpropamide Structure-



f) What are thyroidal hormones? Give their examples and structure of Thyroxine

Ans.- (Each sub bit will carry one mark)

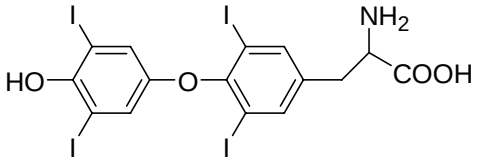
The hormones produced by thyroid gland, like triiodothyronin (T3) and thyroxin (T4) that are responsible for regulation of metabolism, treatment of hypothyroidism and treatment of goitre are called as thyroidal hormones.

Examples-

1. Thyroxin (T_4)
2. Triiodothyronin(T_3)
3. Calcitonin

- The major form of thyroid hormone in the blood is thyroxine (T_4)
- Thyroxin (T_4) is converted to the active triiodothyronin (T_3) within cells by deiodinase.
- Both T_3 and T_4 are used to treat thyroid hormone deficiency called as hypothyroidism.
- Thyroid gland also secretes Calcitonin hormone.

Structure of Thyroxine

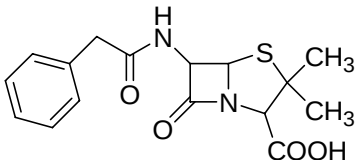


Q.6 Attempt any FOUR of the following (Each question will carry THREE marks)

a) Give structure, properties, stability, storage condition and uses of Benzyl penicillin.

Ans.- (Structure will carry One mark, remaining sub bits will carry Half mark)

Structure of Benzyl penicillin-



Properties:

1. It occurs as white, finely crystalline, hygroscopic powder.
2. It has faint characteristic odor.
3. It is very soluble in water, practically insoluble in fixed oils and liquid paraffin.
4. Its solution is dextrorotatory

Stability:

The stability of Benzyl penicillin is depends on its moisture content. When moisture content is less than 0.5% it can be stored at room temperature for 2-3 years without loss of potency. For maximum stability, its aqueous solution should be buffered at pH 6 to7 and kept at low temperature.

Storage condition:

It should be stored in air tight container at temperature less than 30^0 C

Uses:

1. Useful in the infection caused by Streptococcus pneumonia, pneumococcal pneumonia, Streptococcus pyogenes, Actinomyces, Clostridium, Bacillus anthracis etc.
2. It is also used to treat infections caused by anaerobes, in meningococcal infections, gonococcal infections, syphilis etc.

b) Classify Antitubercular drugs with examples and draw structure of INH

Ans.- (Classification with examples will carry Two marks and Structure will carry one mark)

Classification of Antitubercular drugs:

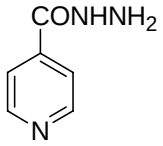
1. Synthetic drugs- Para amino salicylic acid, Isoniazid, Pyrazinamide, Ehionamide, Thioacetazone etc.
2. Antibiotics- Streptomycin, Rifampin, Cycloserin etc.

OR

It can be also be classified as

1. First line drugs- Isoniazid, Rifampin, Ethambutol, Pyrazinamide, Streptomycin etc.
2. Second line drugs- Ethionamide, Cycloserin, Para amino salicylic acid etc.
3. Third line drugs- Clarithromycin, Thioacetazone, Arginine, Vit.D etc.

Structure of INH:



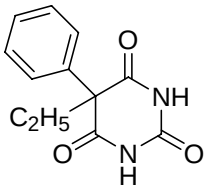
c) Classify Hypnotics and Sedatives giving examples and draw structure of Phenobarbitone.

Ans.- (Classification with examples will carry Two marks and Structure will carry one mark)

Classification of Hypnotics and Sedatives:

1. Barbiturates-
   - **a)** Longer acting barbiturates- (More than 8 Hrs)- Phenobarbitone, Mephobarbitone
   - **b)** Intermediate acting barbiturates-(3 to 6 Hrs)- Butobarbital
   - **c)** Short acting barbiturates- (Less than 3 Hrs)- Secobarbitone, Pentobarbitone
   - **d)** Ultra short acting barbiturates (Less than 30 min.)- Thipentone, Hexobarbitone
2. Non- barbiturates- Glutethimide, Paraldehyde, Triclofos sodium, Zopiclone
3. Benzodiazepines- Diazepam, Nitrazepam etc.

Structure of Phenobarbitone:

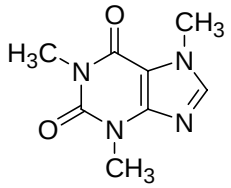


d) What are Analeptics? Give structure, chemical name and uses of Caffeine.

Ans.- (Analeptic definition will carry one mark, structure will carry One mark and remaining two sub bits will carry Half mark)

Analeptics- These drugs are used to stimulate central nervous system, so it reduces narcosis brought about by excess of depressant drugs.

Structure of Caffeine:



Chemical name of Caffeine: 1,3,7-Trimethyl xanthine

Uses of Caffeine:

1. Stimulation of central nervous system
2. Used as diuretic
3. Vasodilation of peripheral vessles
4. Relieve mental fatigue, headache, drowsiness

e) Define and classify antimalarials with examples.

Ans.- (Definition will carry one mark and Classification will carry Two marks)

Antimalarial Drugs- The drugs which are used in the treatment of malaria caused due to Plasmodium species like, Plasmodium Vivax, Plasmodium falciparum, Plasmodium Malariae, Plasmodium ovale called as antimalarial drugs.

Classification of antimalarial drugs:

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

f) Define Antihistamines. Write properties, uses and official preparations of Chlorpheniramine Maleate.

Ans.- (Definition will carry one mark , uses will carry one mark and properties and official preparations will carry half mark)

Antihistamines: Antihistamines are agents which diminish or prevent several actions of histamine in the body like allergic reactions, rhinitis, urticaria, mild asthma etc.

Properties of Chlorpheniramine Maleate:

1. It is a white, odorless, crystalline powder with bitter taste.
2. It is soluble in water, alcohol and chloroform but slightly soluble in ether
3. 1% solution in water has pH 4 to 5

Uses of Chlorpheniramine Maleate:

1. To suppress allergic disorders like pollinosis, urticaria
2. Treatment of seasonal hay fever, rhinitis, sneezing
3. To counteract pruritis, dermatitis induced by other drugs
4. Treatment of mild asthma.

Official preparations:

1. Chlorpheniramine tablet I.P.
2. Chlorpheniramine injection B.P.
3. Chlorpheniramine syrup U.S.P.
4. Chlorpheniramine elixir I.P., B.P.