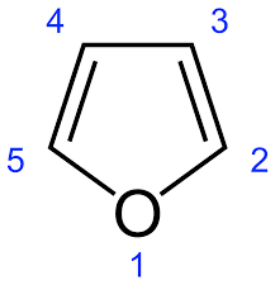
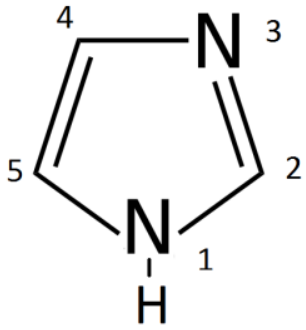
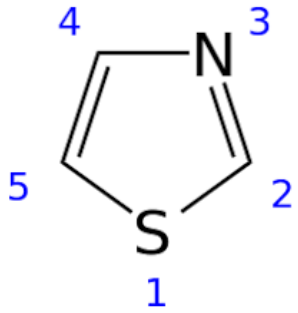
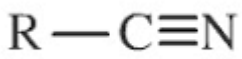
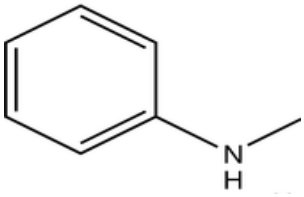
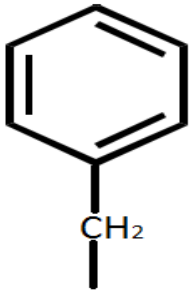
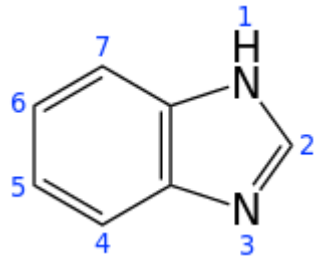
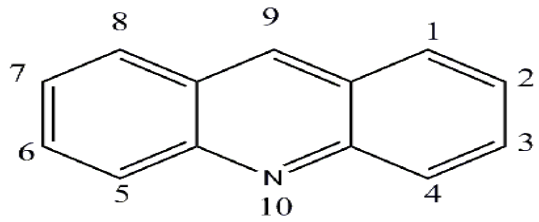
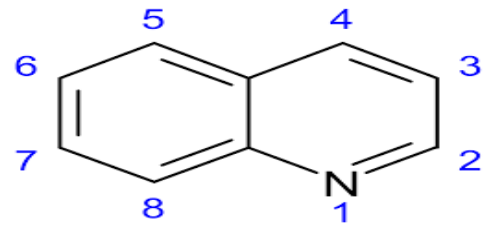
Important Instructions to examiners:

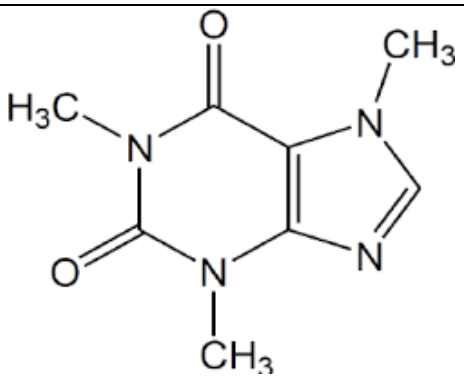
1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
3) The language errors such as grammatical, spelling 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 anyequivalent 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.

1		**Attempt any <u>EIGHT</u> of the following:**	**16M (8X2 M)**
1	a)	**Give structure and numbering method for (any two):** **i) Furan**  **ii) Imidazole**  **iii) Thiazole** 	**1 M each**

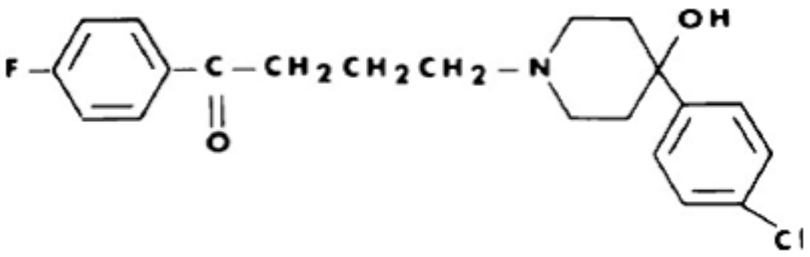
1	b)	**Define following terms (any two):** i) **Diuretics**: Drugs which promote excretion of water & electrolytes from body through kidneys in the form of urine are called diuretics. ii) **Antineoplastics:** Antineoplastic agents, also known as cytotoxic agents and are used in the treatment of malignant diseases when surgery or radiotherapy is not possible or has proved ineffective, in other words, the agents used in the treatment of neoplasm/cancer are called antineoplastic agents. **ii) Anti-coagulants:** Anticoagulants are the substances that prevent coagulation of blood or prolong the coagulation time. They are used to prevent thrombosis.	**1 M each**
1	c)	**Give the structure of following organic group (any two):** i) **Cyano**  **ii) Aniline**  **iii) Benzyl** 	**1 M each**

1	d)	**Give the structure and numbering method for following (any two):** **i) Benzimidazole**  **ii) Acridine**  **iii) Quinoline** 	**1 M each**
1	e)	**Give the uses of (any two):** **i) Paracetamol:** 1. Antipyretic. 2. Analgesics for relief of pain such as headache, toothache, neuralgia. **ii) Proflavin:** 1. It is slow acting antiseptic. 2. It is effective against many gram positive and gram negative bacteria. 3. It is used in treatment of infected wounds, dressing of wounds and burns. 4. Also used for local infection of external ear, mouth, throat and skin **ii) 5-fluorouracil:**It is cytotoxic agent. It is used :	**1 M each**

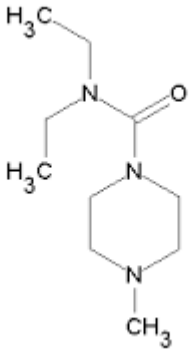
		1. Alone or in conjuction with radiotherapy, in palliative treatment of neoplasm of gastro-intestinal tract, breast and pancreas and respiratory tract. 2. To treat solar keratoses and other malignant conditions of skin.	
1	**f)**	**Give the stability – storage condition of (any two):** i) **Heparin**: The aqueous solution is stable for at least 7 years at pH 7 to 8.It is stored in sealed, sterile container so as to exclude microorganism and moisture. ii) **Insulin**: As insulin is affected by heat & light, all insulin preparations must be stored at low temperatures between 2-8°C. It should not be allowed to freeze. iii) **Thrombin**: 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.	**1 M each**
1	**g)**	**Give the brand names of (any two):** i) **Phenformin** : Sucronase, Bislim, Diaformin ii) **Tetracyclin**: Achromycin, Enterocyclin, Cadicyclin iii) **Aspirin**: Aspro, Anacin, Coldarin, Powerin, Mejorol, codopyrin	**1 M each**
1	**h)**	**Give the names of two drugs from the following categories (any two):** i) **Antiseptic and Disinfectants**: Phenol, Chlorocresol. Chloroxylenol, Hexachlorophene, Alcohol, Formaldehyde, Chloramine T, Povidone iodine, , Thiomersal, Brilliant green, Proflavine, Crystal Violet (gentian violet), Benzalkonium chloride, Cetrimide, ichthamol, Nitrofurazone ii) **Antihypertensives**: α-methyldopa, clonidine, Pentolinium, Reserpine, Guanethidine, Propranalol, Atenolol, Prazosin, Tolazoline, Hydralazine, Minoxidil, Verapamil, Captopril, enalapril, losartan, Nifedipin iii) **Antihistaminic**: Diphenhydramine, mepyramine, pheniramine, chlorpheniramine, triprolidine, promethazine, meclzine, cyproheptadine	**1 M each (for 2 correct names)**
1	**i)**	**Draw the structure of following (any two):** i) **Caffeine**:	**1 M each**

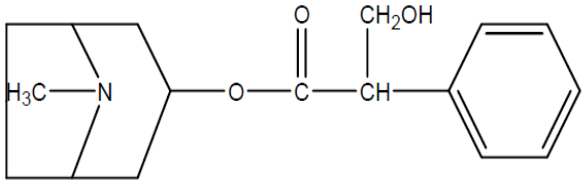


ii) **Haloperidol**:



iii)**DEC**:



1	**j)**	**Give structure and uses of (any one):** **i) Atropine:**  **Uses**: 1. By acting on CNS a) To treat parkinsonism	**1 M for stru.** **1 M for uses**

b) In small doses it is CNS stimulant

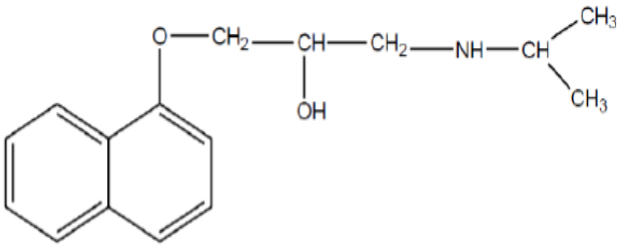
3. Due to antimuscarinic activity

a) As a mydriatic in ophthalmology

b) As an antispasmodic to treat renal and biliary colic and bronchial asthama

4. For anaesthetic premedication
5. To treat sialorrhoea(excessive secretion of saliva)
6. To treat acute rhinitis, hay fever
7. To treat organophosphorus compound poisoning
8. For gastric and duodenal ulcer
9. With morphine it is used to lower respiratory depression
10. In small doses to prevent excessive peristalsis and colic pain produced by irritant purgatives

ii) Propranolol:



Uses: It is used to treat: cardiac arrhythmia, auricular fibrilation, angina pectoris, arterial hypertention, hyperthyroidism in children and symptoms of anxiety

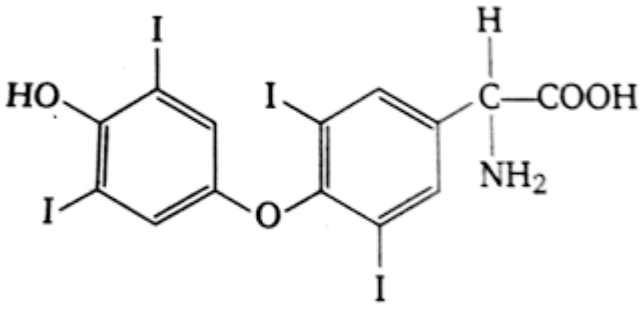
1	k)	**Define vitamins. Write the importance of vitamin A.**	**1 M for def** **1 M for importance**

- **Definition:** Vitamins may be defined as potent organic substances which are essential for normal growth and maintenance of life of human and animals, which are not able to synthesize in adequate quantity
- **Importance of vitamin A:**

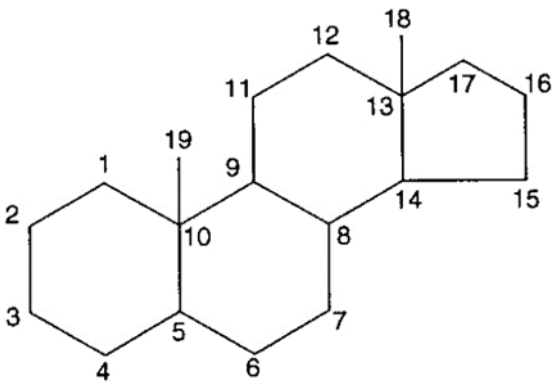
1. It is used for treating vitamin A deficiency.
2. Prevention and treatment of Night blindness, Xerophthalmia and keratomalacia.
3. Vitamin A is important for growth, development and maintenance of immune system.
4. Some people use vitamin A for improving vision and treating eye disorders including age-

		related macular degeneration (AMD), glaucoma and cataracts. 5. Vitamin A is also used for skin conditions including acne, eczema, psoriasis, cold sores, wounds, burns, sunburn.	
1	**l)**	**Write uses of (any two):** **i) Evan's blue:** • Evans Blue is a di-azo compound used to determine 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. **ii) Congo red:** • It is employed as a diagnostic aid in amyloidosis (In medicin a variety of conditions in which amyloid proteins are abnormally deposited in tissues) • It is used in laboratory as indicator **iii) Indigocarmine:** • It is administered intravenously to test renal function (by estimating the rate of excretion of urine) & to locate the ureteral orifices during ureteral catheterisation and cystoscopy. • In the lab it is used as indicator.	**1 M each**
2		**Attempt any <u>FOUR</u> of the following:**	**12M (4x3 M)**
2	**a)**	**What is co-trimoxazole? Explain mechanism of action and give two brand names of Co-trimoxazole.** • Cotrimoxazole is the combination of two drugs i.e. Sulphamethoxazole and Trimethoprim in a proportion of 5:1. • Mechanism of action: Sulphonamides block the biosynthesis of folic acid from p-amino benzoic acid. Trimethoprim inhibits the enzyme folate reductase and blocks the conversion of	**1M** **1 M**

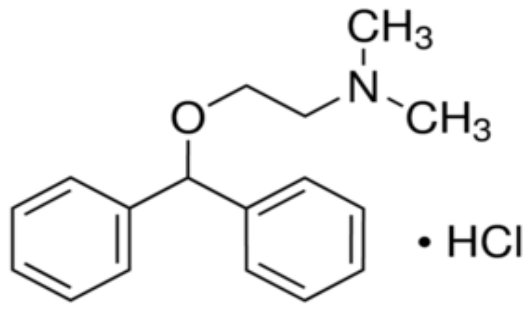
		folic acid to tetrahydofolic acid (THF). THF is the form required for coenzyme synthesis. Combination of Sulphamethoxazole and Trimethoprim by synergism produces bactericidal effect. • Brand names: Septran, bactrim, ciplin, uritrim, septabid, sepmax	**1 M**
2	**b)**	**Define "neoplasm" and classify antineoplastic agents.** **Neoplasm:** Neoplasm is the medical term for cancer or tumour which means a relatively autonomous growth of tissues. **Classification:** 1. Alkylating Agents. a) Nitrogen mustard drugs: Mustine, Chormabucil, cyclophosphamide b) Aziridines: Thiotepa c) Alkyl sulphonate: Busulphan d) Nitrosourea group compound: Lomustine 2) Antimetabolites: Methotrexate, Mercaptopurine, Azathioprine, Fluorouracil 3) Antibiotics: Actinomycin, Daunorubicin, Doxorubicin 4) Plant Products: Sulphates of vinblastin and vincristine. 5) Hormones and related drugs: Glucocorticoids, Tamoxifen 6) Miscellaneous agents: Hydroxyurea, cisplat	**1 M** **2 M**
2	**c)**	**Explain diabetes mellitus. Classify hypoglycaemic agents with examples.** Diabetes Mellitus: - Diabetes Mellitus is a condition characterized by hyperglycemia (excessive sugar in blood, than the threshold value) & glycosuria (presence of sugar in urine).The disease is caused by deficiency of insulin, a protein hormone secreted by beta cells of islets of Langerhans, responsible for proper carbohydrate metabolism.	**1M** **2 M**

		Classification 1. Parenteral hypoglycemics agents (Insulin) a) Short acting- Neutral Insulin b) Intermediate acting- Isophane (NPH) Insulin, Lente Insulin c) Longer acting- Ultralente Insulin 2. Oral hypoglycemic agents a) Sulphonylureas- Tolbutamide, Chlorpropamide, , libenclamide b) Biguanides- Phenformin, Metformin c) Thiazolidinediones (TZDs)- Rosiglitazone, Pioglitazone d) Alpha glucosidase inhibitors- Acarbose, Miglitol, Voglibose	
2	**d)**	**Give structure properties and uses of 'Thyroxin'.** **Srtucture**  **Properties:** • It is light yellow to buff coloured powder which is odourless and tasteless • It is slightly soluble in water and in alcohol and soluble in solutions of alkali hydroxide and carbonates. **Uses: -** 1. To treat Hypothyroidism. 2. To suppress Goitre. 3. To treat cretinism 4. To treat thyrotoxicosis.	**1 M each**
2	**e)**	**Name the drug used in (any three):** i) **Myasthenia gravis** : Neostigmine, Physostigmine, Pyridostigmine ii) **Leprosy:** Dapsone, solapsone, thiacetazone, clofazimine, thiambutosin, sulphadoxine,	**1 M each (for 2**

		rifampicin, kannamycin iii) **Gout:** Diclofenac, Ibuprofen, Naproxen, Celecoxib, Allopurinol, Colchicine iv) **Tuberculosis:** Isoniazide, ethambutol, pyrazinamide, rifampicin, PAS, streptomycin, cycloserin v) **Parkinsonism:** Atropine, Levodopa-carbidopa, Benserazide, Amantadine,, Bromocriptine, Trihexyphenidyl(Benzhexol), Biperiden, selegiline,	**correct drugs)**
2	**f)**	**Define Cholinergic drugs. Write the uses of Pilocarpine and Physostigmine.** **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 mydriatic on the eye 4. For diagnosis of Adie's pupil 5. For accommodation of near vision of eye. 6. To counteract anticholinergic side effects(dryness of mouth, constipation and impaired vision) • Physostigmine: 1. Used as miotic 2. Decreases intraocular pressure in glaucoma. 3. Used for reversal of post-operative over sedation 4. Used for the treatment of poisoning due to anticholinergic and Tricyclic antidepressants 5. To treat some psychiatric and neurological disorders(e.g. Alzheimer's disease)	**1 M** **1 M** **1M**
3		**Attempt any <u>FOUR</u> of the following:**	**12M (4x3 M)**
3	**a)**	**Define sedative and hypnotics. Classify them.** **Definition**-Hypnotics are drugs which induce sleep by depression of central nervous system function, while sedatives are the agents which reduce excitement & motor activity, & produce a	**1 M**

		calming effect without inducing sleep. Thus, small doses of hypnotics may act as a sedative, while large doses act as hypnotic agent. **Classification:** 1. Barbiturates – These drugs contains barbituric acid nucleus in the structure and depending upon duration of action sub classified as follows : a) Long acting barbiturates – (6 hrs or more) e.g. Barbitone, phenobarbitone b) Intermediate acting barbiturates – (3 to 6 hrs) e.g. Butobarbitone c) Short acting barbiturates- (less than 3 hrs) e.g. Cyclobarbitone d) Ultrashort acting (intravenous) barbiturates – (1/2 to 1 hr) E.g. Methohexitone sodium, thiopentone sodium 2. Non-barbiturates. They are as follows below:- a) Benzo 1,4, diazepine derivative e.g. Diazepam, Nitrazepam b) Piperidin-2,6 dione deravitive e.g. Glutethimide, Methyprylone c) Quinazolinones e.g. Methaqulone d) Alcohol and their derivatives e.g. Triclofos sodium e) Aldehyde and its derivatives e.g. Paraldehyde f) Acyclic nitrogen containing compound e.g. Meprobamate g) Miscellaneous e.g. Diphenhydramine hydrochloride, promethazine	**2 M**
3	**b)**	**Draw the structure of steroidal nucleus with numbering. Write uses of testosterone.**  **Uses of testosterone:-** • Testosterone as well as other androgenic compounds finds use in the male for replacement in	**1 M each**

		hypogonadism, eunuchoidism & the male climacteric. • They also find use in the treatment of gynaecomastia. • They also find use in the treatment of disseminated breast cancer in postmenopausal women. • Testosterone in the form of esters are used in the form of an oily injection & administered intramuscularly subcutaneously.	
3	**c)**	**Define "Cardiovascular agent". Classify them based on their therapeutic uses with examples.** **Definition** • 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. **OR** • Cardiovascular Agents represents a group of drugs which have direct action on the heart or other parts of the vascular system so that they modify the total output to the heart or the distribution of blood to certain parts of the circulatory system. **Classification of cardiovascular agents:-** Different kinds of drugs fall under this category like: 1) Cardiotonics (Positive cardiac inotropic agents):- e.g. Cardiac glycosides obtained from Digitalis, Stropanthus, squill such as Digoxin, Digitoxin, Lanatoside C etc. 2) Antiarrhythmic drugs:- a) Membrane-stabilizing agents (Na channel blockers):- e.g. Quinidine, Procainamide, Disopyramide, Phenytoin, lignocaine hydrochloride 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:- a) Organic nitrates e.g. Amyl nitrate, Isosorbid nitrate b) Calcium-channel blockers e.g. Verapamil c) β-adrenergic blockers e.g. Propranolol 4) Anti-hypertensive:- a) Centrally acting agents: e.g. α-methyldopa, clonidine b) Ganglion blockers : e.g. Pentolinium, Mecamylamine	**1M** **2 M**

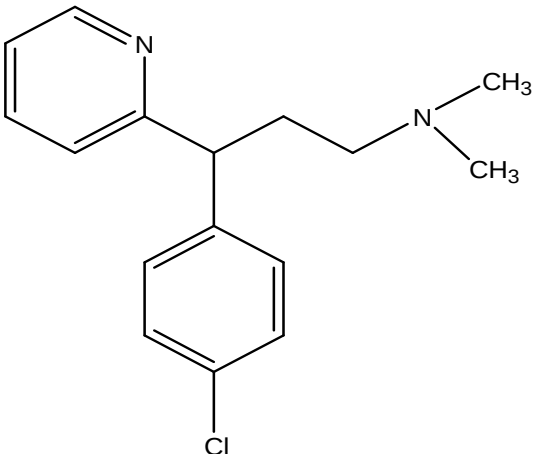
		c) Adrenergic neuron blockers e.g. Reserpine, Guanethidine d) β-adrenergic blockers e.g. Propranalol, Atenolol e) α-adrenergic blockers e.g. Prazosin, Tolazoline f) Direct-acting vasodilators e.g. Hydralazine, Minoxidil g) Calcium channel blockers eg. Verapamil h) Angiotensin converting enzyme inhibitors (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	
3	**d)**	**What is Histamine? Give structure and uses of any antihistaminic agent.** • Histamine is a biogenic amine involved in local immune responses as well as regulating physiological function in the gut and acting as a neurotransmitter. • Histamine triggers the inflammatory response. As part of an immune response to foreign pathogens, histamine is produced by basophils and by mast cells found in nearby connective tissues. • Histamine increases the permeability of the capillaries to white blood cells and other proteins, in order to allow them to engage foreign invaders in the affected tissues. • It is found in virtually all animal body cells. **Diphenhydramine hydrochloride:-**  **Uses of diphenhydramine:-** • Diphenhydramine is an antihistamine used to relieve symptoms of allergy, hay fever, and the	**1 M each**

common cold.

- These symptoms include rash, itching, watery eyes, itchy eyes/nose/throat, cough, runny nose, and sneezing.
- It is also used to prevent and treat nausea, vomiting and dizziness caused by motion sickness.
- Diphenhydramine can also be used to help you relax and fall asleep.

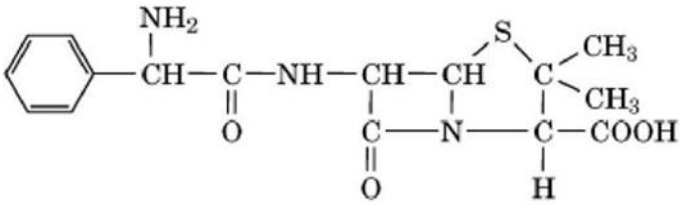
OR

Chlorpheniramine:-



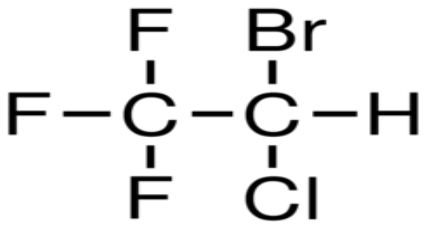
Uses of Chlorpheniramine:-

- Chlorpheniramine is an antihistamine that reduces the effects of natural chemical histamine in the body.
- Histamine can produce symptoms of sneezing, itching, watery eyes, and runny nose.
- Chlorpheniramine is used to treat runny nose, sneezing, itching, and watery eyes caused by allergies, the common cold, or the flu.

3	e)	**Give the structure and uses of (any two):** **(i) Ampicillin- Structure** 	**1 M** **str.** **0.5 M** **uses**

Uses- Generally indicated for a number of bacterial infections including shigellosis (dysentery), gonorrhoea, meningitis, Escherichia coli, Streptococcal and Staphylococcal infections.

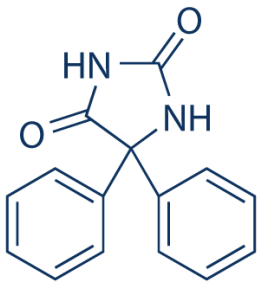
(ii) Halothane- Structure



Uses-

- It is the most potent anaesthetic & is administered by inhalation.
- Induction of anaesthesia by halothane is smooth & rapid, & does not cause irritation to the mucous membrane.

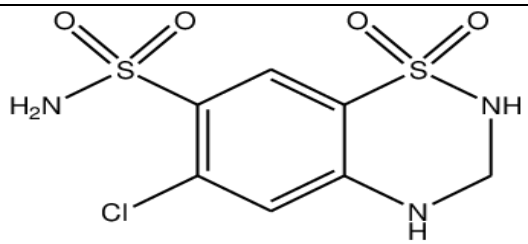
(iii) Phenytoin- Structure



Uses-

- It is used in symptomatic therapy of epilepsy.
- It is the drug of choice in preventing major convulsive seizures.
- It is also used in cardiac arrhythmias.

(iv) Hydrochlorthiazide- Structure

		 **Uses-** • Hydrochlorothiazide is a thiazide diuretic that helps prevent your body from absorbing too much salt, which can cause fluid retention. • Hydrochlorothiazide is used to treat high blood pressure (hypertension). • Hydrochlorothiazide is also used to treat fluid retention (edema) in people with congestive heart failure, cirrhosis of the liver, or kidney disorders, or edema caused by taking steroids or estrogen.	
3	**f)**	**Define and classify diuretics with examples.** **Definition**-Drugs which promote excretion of water & electrolytes from body through kidneys in the form of urine are called diuretics. **<u>Classification of diuretics</u>** 1. Water & Osmotic agents- a) Electrolytes:-Sodium & Potassium salts b) Non electrolytes:- Mannitol, Urea 2. Organic mercurials:- Mersalyl acid,Mercaptomerin 3. Acidifying agents:-Ammonium chloride, Arginine hydrochloride 4. Alpha-beta unsaturated ketones:- Ethacrynic acid (High ceiling diuretic, loop diuretic) 5. Purines & related compound: Caffeine 6. Sulphonamides:- a) Carbonic anhydrase inhibitors-e.g. Acetazolamide b) Benzothidiazines (Thiazides): - Chlorthiazide, Hydrochlorothiazide c) Sulphamoyl benzoic acid derivatives e.g. Furosemide (High ceiling diuretic, loop diuretic)	**1 M** **2 M**

		7. Endocrine antagonists: (aldosterone antagonists) e.g. Spironolactone 8. Miscellaneous agents: - Triamterene, Amiloride (Potassium sparing diuretic)	
4		**Attempt any FOUR of the following:**	**12M (4X3 M)**
4	**a)**	**Define and classify Antimalarial agents.** **Definition-**Antimalarial drugs are intended to treat and prevent malaria by killing the parasite in the liver or the bloodstream. **Classification-** • Quinine salts E.g. Quinine sulphate, Quinine phosphate, Quinine dihydrochloride. • 8-Aminoquinolines E.g. Pamaquine, Primaquine. • 4-Aminoquinolines E.g. Chloroquine , Amodiaquine. • 9-Aminoacridines E.g. Mepacrine. • Biguanides E.g. Proguanil. • Diaminopyrimidines. E.g. Pyrimethamine. • Artemisinin & its derivatives • Miscellaneous: - They are further classified as mentioned below a) Sulfones & sulfonamides Examples are sulphamethoxypyridazine, sulphadimethoxine, sulfadoxine, sulfalene, sulfadiazine, sulfisoxazole & dapsone b) Antibiotics c) Various vaccines d) Insecticides	**1 M** **2 M**
4	**b)**	**Define the term Cardiotonic. Write about their hydrolysis products.** **Definition-** 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). • 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	**1 M** **2 M**

examples of cardiac glycosides.

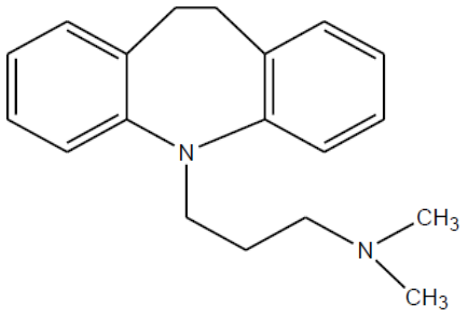
- The hydrolysis products of these are as follows:

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

4 c) Define Thymoleptics/Antidepressant. Give structure and uses of imipramine. **1 M each**

Definition- Antidepressants are drugs which counteract or overcome mental depression. These drugs are therapeutically useful in a variety of cases pertaining to mentally ill patients.

Structure-



Uses-

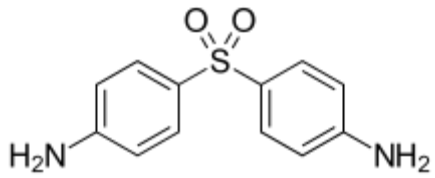
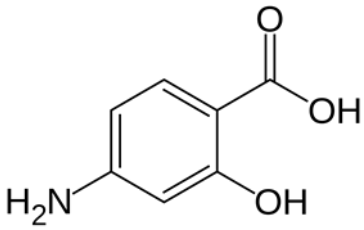
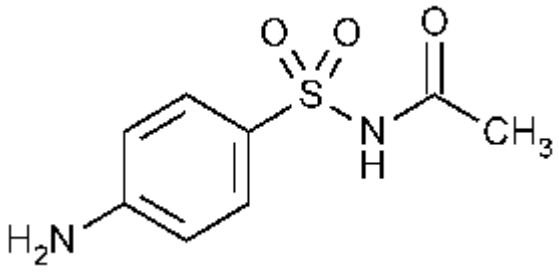
1**.** Imipramine is a tricyclic antidepressant.

2. Imipramine affects chemicals in the brain that may be unbalanced in people with depression.

3. Imipramine is used to treat symptoms of depression.

4. Imipramine is sometimes used to treat bed-wetting in children ages 6 and older.

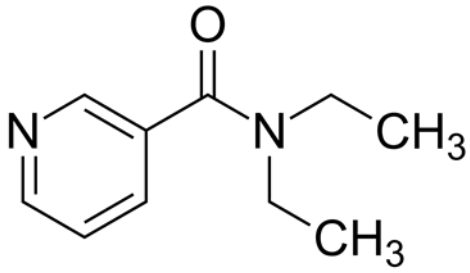
4 d) Give the structure, chemical name and uses of Dapsone. **1 M**

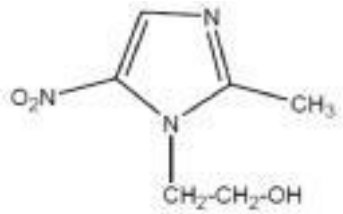
		Structure-  **Chemical name- bis (4-aminophenyl) sulphone or 4,4'-diamino, diphenyl sulphone** **Uses-** • Dapsone (diamino-diphenyl sulfone) is a pharmacological medication most commonly used in combination with rifampicin and clofazimine as multidrug therapy (MDT) for the treatment of *Mycobacterium leprae* infections (leprosy). • Dapsone is used in combination with pyrimethamine in the treatment of malaria.	**each**
4	**e)**	**Draw the structure from the chemical name and name the drugs:** **(i) 4 amino 2 hydroxy benzoic acid-** para amino salicylic acid(PAS)  **(ii) Ni-acetyl Sulfanilamide-** Sulfacetamide 	**1.5 M** **each**
4	**f)**	**Define CNS stimulants. Discuss their uses and draw structure of Coramine.** **Definition-** Are drugs that increase activity in certain areas or the whole of the brain. Also known as "analeptics".	**1 M** **each**

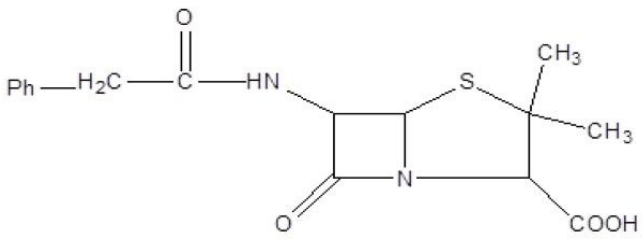
Uses-Can have a number of therapeutic uses:-

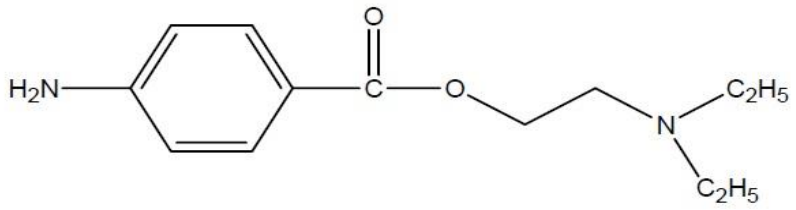
- These drugs are used to improve wakefulness in patients that have narcolepsy.
- Useful as respiratory stimulants & this action is brought about through chemo receptors & the vasomotor centre.
- Some of them also have "anorexient" effects.

Structure of Coramine

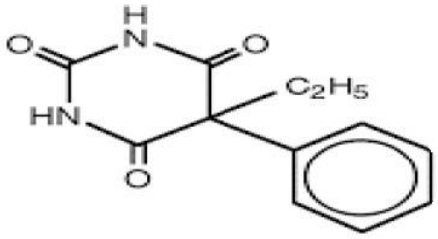


5		**Attempt any <u>FOUR</u> of the following**	**12M (4X3 M)**
5	**a)**	**What is amoebiasis? Write structure and uses of metronidazole.** **Amoebiasis:** Amoebiasis is a parasitic infection of the intestines caused by the protozoan *Entamoeba histolytica.* The symptoms of amoebiasis include abdominal pain, passage of soft stools with mucus & occasional blood, fatigue, excessive gas, rectal pain, unintentional weight loss etc. **Structure of Metronidazole:**  **Uses:** 1. It has antiprotozoal and antibacterial action 2. It is 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* etc.	**1 M Each**

5	b)	**Define & classify general Anaesthetics based on their route of administration.** **Definition**: General anaesthetics 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) 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) Miscellaneous. E.g. Etomidate, Propofol.	**1 M** **2 M**
5	c)	**Define antibiotics. Give structure preparation and uses of Benzyl Penicillin.** **Definition**: Antibiotics are chemical substances produced by certain species of microorganisms during their growth on suitable culture media and having the property of inhibiting the growth of or destroying other microorganisms in high dilutions or low concentration. **Structure:**  **Preparation:**	**1 M** **1 M**

		1. Benzyl penicillin injection 2. Benzyl penicillin sodium injection **Uses:** It is used in the treatment of following diseases: 1) Respiratory tract infection 2) Urinary tract infection 3) Gonorrhea 4) Meningitis 5) Enteric infection 6) Septicemia.	**0.5 M** **0.5 M**
5	**d)**	**Define local anaesthetics? Write structure and chemical name of procaine hydrochloride.** **Definition:** Local anesthetics are drugs which produce insensitivity in a limited area around the site of application or injection of the drug by preventing generation and conduction of impulses along nerve fibres and nerve ending and the effects are reversible. **Structure of procaine**  **Chemical name –** 4-amino-(2-diethyl amino ethyl) benzoate or 2-(Diethyl amino) ethyl-4-amino benzoate.	**1 M Each**
5	**e)**	**What are anti-hypelipidemic agents? Give properties and brand names of clofibrate.** **Anti-hypelipidemic agents:** Hyperlipidemia is the most prevalent indicator for susceptibility to atherosclerotic heart disease & it also describes elevated plasma levels of lipids that are usually in the form of lipoproteins. Drugs which are used to reduce the elevated levels of the lipids in the blood are called anti-hypelipidemic agents. **Properties:** 1. It is a stable, clear, and colorless to pale yellow liquid with a characteristic faintly acrid odor.	**1 M Each**

		2. It is very slightly soluble in water; miscible with alcohol, chloroform & ether. **Brand names:** Clobibram, Clofinit, Claripe, Abitrate, Atromid, Amotril, Lipamid,	
5	**f)**	**Name the respective vitamins of which nutritional deficiency leads to;** **i. Beri-beri:** Vitamin B1/ Thiamine **ii. Rickets:** Vitamin D **iii. Scurvy:** Vitamin-C	**1 M Each**
6		**Attempt any <u>FOUR</u> of the following**	**16M (4X4 M)**
6	**a)**	**What is epilepsy? Classify anti consultants with examples?** **Epilepsy:** It is defined as paroxysmal (sudden), self-sustaining and self-limiting cerebral dysrhythmia. It is characterized by an abnormal and excessive neuronal discharge and by disturbance of consciousness. It is proposed that seizures were caused by sudden, occasional, rapid, excessive, local electrical (nervous) discharges which originate in grey matter &spread to other parts of CNS. Epilepsy may or may not be associated with body movements or hyperactivity of ANS. Convulsive states have been observed in systems where concentration of GABA (Gamma Amino Butyric Acid) in brain is below certain level or the effect of GABA is blocked. **Classification:** 1) Barbiturates: e.g.:Phenobarbitone, Mephobarbitone. 2) Hydantoin Derivatives: e.g.: Phenytoin ,Methoin , Ethotoin 3) Succinimides : e.g.: Ethosuccimide, Phensuccimide 4) Oxazolidine 2, 4 diones e.g. Trimethadione ,Paramethadione. 5) Glutarimides e.g. Amino glutethimide 6) Acyl ureides/acylureas e.g. Phenacemide. 7) Benzodiazepine derivatives e.g. Diazepam, Clonazepam, Nitrazepam 8) Dibenzazepines e.g. carbamazepine 9) Hexahydrapyrimide 4,6 dione e.g. Primidone 10) Carboxylic acids e.g. Sodium Valproate	**1 M** **3 M**

		11) Sulphonamides e.g. Acetazolamide	
6	**b)**	**Classify antibiotics with examples.** **Classification:** I. β-Lactam antibiotics: e.g. Benzyl Penicillin, Phenoxymethyl penicillin, Cephaloridine, cephalothin II. Non-β-Lactam antibiotics: 1. Tetracyclines: e.g chlortetracycline, oxytetracycline. 2. Aminoglycoside antibiotics : e.g: Streptomycin, neomycin, gentamicin 3. Macrolide antibiotics : e.g : Erythromicin 4. Ansamycins : e.g: Rifamycin 5. Polyene macrolide antibiotics: e.g: Nystatin, Hamycin 6. Anthracycline antibiotics : e.g :actinomycin, daunorubicin 7. Peptide antibiotics: e.g: Bacitracin. 8. Steroidal antibiotics : e.g : Fusidic acid 9. Nucleoside anitibiotics: e.g : Puromycin 10. Non- classifiable antibiotics : e.g : Chloramphenicol	
6	**c)**	**Give structure, properties, uses and brand names of Phenobarbitone.** **Phenobarbitone:**  **Properties:** 1. It is white, crystalline, odorless solid. 2. It has bitter taste. 3. It is soluble in water and alcohol, slightly soluble in chloroform and solution of alkali hydroxide and carbonates. 4. It may exhibit polymorphism.	**1 M Each**

		Uses: 1. It is used as antiepileptic agent to control tonic-clonic seizures. 2. It is also have been used as a hypnotic and sedative. **Brand names:** Luminal, Gardenal, Pheno, Phenoson, Barbit, Berdinal	
6	**d)**	**Give uses & preparation (any two)** **i. Chloramphenicol** **Uses:** 1. It was used in the treatment of typhoid. 2. It may be used as a second-line agent in the treatment of tetracycline-resistant cholera. 3. It is also useful in the treatment of brain abscesses. 4. It is also applied locally for treatment of ear, eye and skin infection. 5. It is used in treatment of Rickettsia, Chlamydia and mycoplasma. **Preparation:** 1. Chloramphenicol capsules 2. Chloramphenicol injection 3. Chloramphenicol eye drops 4. Chloramphenicol Palmitate suspension. **ii. Salbutamol** **Uses:** 1. It has bronchodilator action 2. Treatment of asthma. 3. Prevention of bronchospasm. **Preparation:** 1. Salbutamol injection 2. Salbutamol tablet 3. Salbutamol syrup	**(2M each for Uses & Preparation)**

		4. Salbutamol aerosol inhalation **iii. Hyoscine** **Uses:** 1. Used in motion sickness. 2. Used as mydriatic. 3. It is used for relief of withdrawal symptom of morphine dependence. 4. Used in treatment of acute mania & delirium with morphine. **Preparation:** 1. Hyoscine tablet 2. Hyoscine injection 3. Hyoscine eyedrops 4. Hyoscine hydrobromide tablet **iv. Promethazine** **Uses:** 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. **Preparation:** 1. Promethazine hydrochloride tablet 2. Promethazine hydrochloride injection 3. Promethazine hydrochloride elixir 4. Promethazine hydrochloride injection	
6	**e)**	**Give uses & stability-storage condition of (any two)** **i. Paraldehyde:** **Uses:** 1. Hypnotic & sedative	**(2M each for Uses &**

2. Used as basal anaesthesia.
3. Anticonvulsants agent

Stability-Storage:

It should be stored in tightly closed airtight container in complete darkness in cool place because it undergoes atmospheric oxidation & produces peroxides.

ii. Cyclopropane:

Uses:

Potent gaseous anesthetics

Stability-Storage:

It is stored in metal cylinder designed to hold compressed gases and kept in a cool room free from inflammable material.

The whole cylinder is painted orange. The shoulder should be stenciled with name or symbol "C_3H_6". The name or symbol should be clearly stamped on the cylinder valve.

iii. Diethyl ether:

Uses:

1. General anesthetic
2. Solvent

Stability-Storage:

It is oxidized by atmospheric oxygen and is affected by light. Hence it is stored in tightly closed, light resistant containers in a cool place. If cork is used as a closer than it should be protected with metal foil. An antioxidant like hydroquinone or propyl gallate in suitable proportion should be added.

iv. Rifampicin

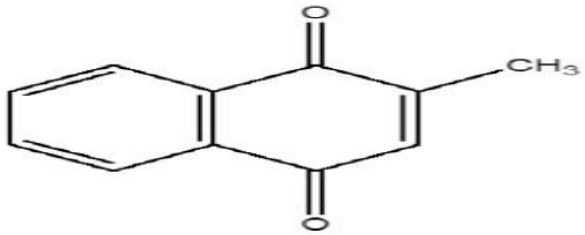
Uses:

1. It is used for treatment of pulmonary tuberculosis.
2. By combination with Dapsone and Clofazimine it is used in the treatment of leprosy.

Stability-Storage:

It should be stored in air tight light resistant containers at a temperature not exceeding 15^oC.

Storage)

6	f)	**Give structure, properties, uses and preparations of Menadione.** **Structure:**  **Properties:** 1. It occurs as a bright yellow crystalline powder. 2. It is practically insoluble in water, sparingly soluble in alcohol & soluble in chloroform. **Uses:** 1. Coagulants 2. In treatment of haemorrhage. 3. To treat vitamin K deficiency. 4. To treat hypoprothrombinemia. 5. Used as radio sensitizer in cancer. **Preparation:** 1. Menadione 2. Menadione injection 3. Menadione tablet	**1M Each**