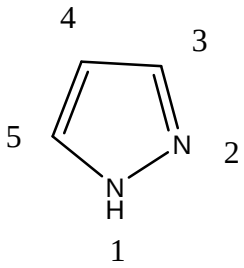
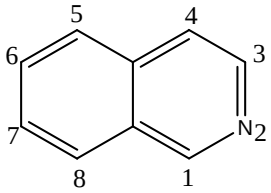
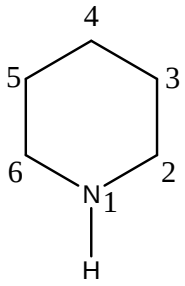
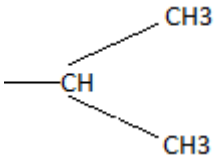
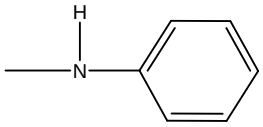
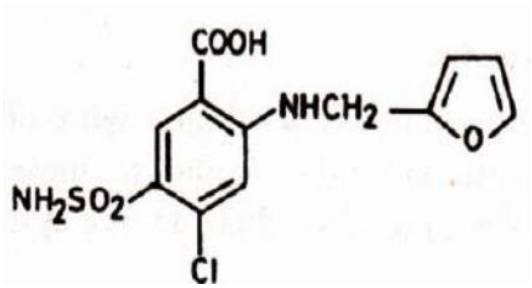
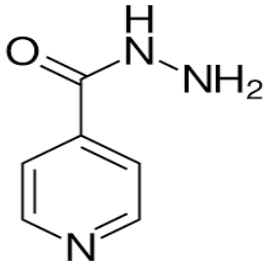
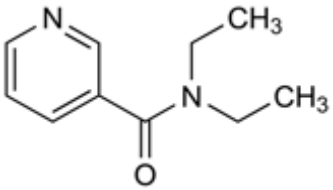
Important Instructions to examiners:

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 (8X2M)**
1	**a)**	**Give structure and method of numbering of (any two)** **(i) Pyrazole**  **(ii) Isoquinoline**  **(iii) Piperidine** 	**1 M Each**
1	**b)**	**Write structure of following groups (any two)** **(i) Acetyl** $-COCH_3$	**1 M Each**

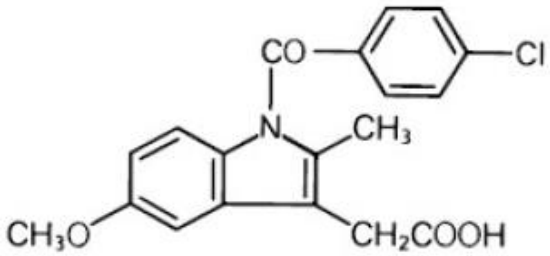
		(ii) Isopropyl  **(iii) Anilino**  	
1	**c)**	**Give the name and structure of drug containing following heterocycle (any two)** **(i) Furan-** **Name of drug is Furosemide**  **(ii) Pyridine-** **Name of drug is Isoniazid**  OR	**1 M Each**

Name of drug is Nikethamide

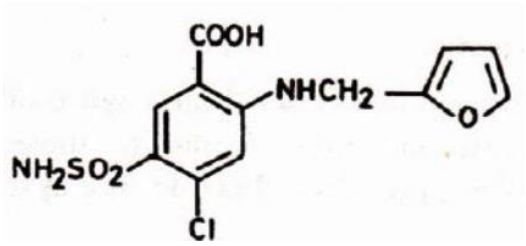


(iii) Indole

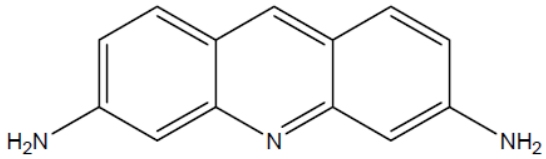
Name of drug is Indomethacin



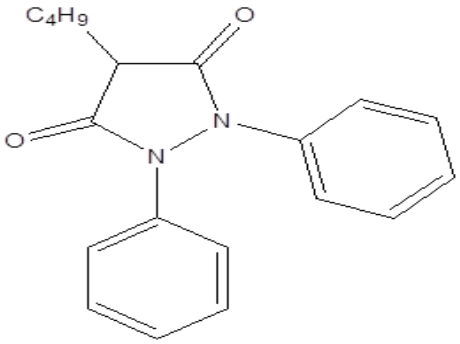
1	**d)**	**Give popular brand names of (any two)** (i) Streptomycin- Ambistryn inj, Cipstryn inj, Merstryp inj. (ii) Paracetamol-Tylenol, Calpol, panadol, crocin, metacin, valadol, paldesic, Dolo (iii) Ibuprofen- Ibugesic, Ibuspan SR, Ibuflamar, Brufen	**1 M Each**
1	**e)**	**Draw structure of drug from given chemical name (any two)** **(i) 4-chloro N-furfuryl 5-sulphamoyl anthranilic acid**	**1 M Each**



(ii) 2,6-diamino acridine



(iii) 4-butyl 1,2-diphenyl Pyrazolidine-3,5-dione



1	f)	**Give uses of following drugs (any two)**	**1 M Each**

Nikethamide-

- Nikethamide is a stimulant which mainly affects the respiratory cycle.
- Widely known by its former trade name of Coramine, it was used in the mid-twentieth century as a medical countermeasure against tranquilizer overdoses.

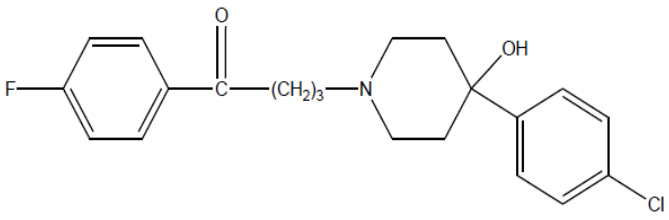
(ii) Benzocaine-

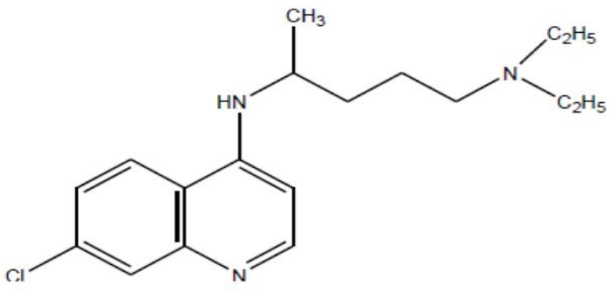
- Is a local anesthetic commonly used as a topical pain reliever. It is the active ingredient in many over-the-counter anesthetic ointments).
- It is also combined with Antipyrine [NSAIDS] to form Otic Drops, to relieve ear pain and remove earwax.

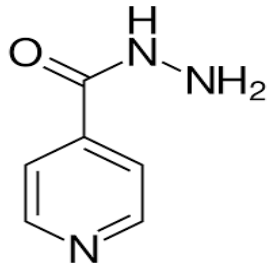
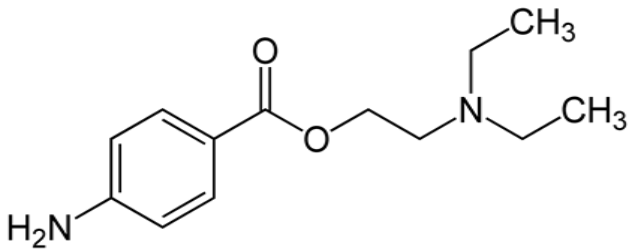
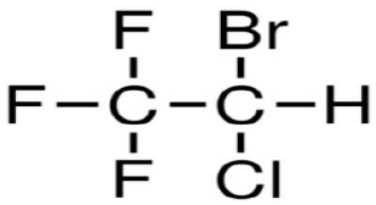
(iii) Warfarin-

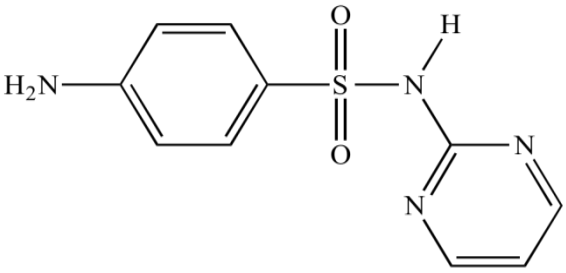
- Warfarin is an anticoagulant (blood thinner).Warfarin reduces the formation of blood clots.

		• Warfarin is used to treat or prevent blood clots in veins or arteries, which can reduce the risk of stroke, heart attack, or other serious conditions.	
1	**g)**	**Explain the following terms (any two)** **(i) Cardiotonic-** These are the drugs which have stimulating action on the cardiac muscles. They increase the force of muscle contraction without increasing oxygen consumption. Cardiac glycosides on hydrolysis yield corresponding sugar and aglycones. **(ii) Neuroleptic-** Neuroleptics also known as Antipsychotics, or major tranquilizers, are a class of medication primarily used to manage psychosis (including delusions, hallucinations, paranoia or disordered thought), principally in schizophrenia and bipolar disorder. **(iii) Analgesic**- An analgesic or painkiller is any member of the group of drugs used to achieve analgesia, relief from pain. Analgesic drugs act in various ways on the peripheral and central nervous systems. They are distinct from anesthetics, which temporarily affect, and in some instances completely eliminate, sensation.	**1M Each**
1	**h)**	**Classify Sympathomimetic agents.** **Classification** : 1) Catecholamines : e.g.: adrenaline, noradrenaline, Isoprenaline, Phenylephrine 2) Non-Catecholamines : a) Containing phenylethylamine skeleton i) with phenolic group: e.g.Salbutamol, Phenylephrine ii) without phenolic hydroxy group :e.g:ephedrine. b) Aliphatic amines : e.g:cyclopentamine c) Imidazolidine derivatives : eg:naphazoline **OR** **Classification:** 1) Catecholamines e.g : Adrenaline, Nor-adrenaline, Isoprenaline, Dopamine 2) Non-Catecholamines eg. Phenylephrine, Salbutamol, Terbutaline, Ephedrine,	**2 M**

		a. Pseudoephedrine 3) Imidazoline derivatives eg. Naphazoline, Xylometazoline **OR** 1) Vasoconstrictors (↑ B. P.): Noradrenaline (Norepinephrine), Dopamine, Ephedrine 2) Cardiac stimulants: Dopamine, Adrenaline (Epinephrine), Isoprenaline 3) CNS stimulants: Amphetamine 4) Smooth muscle relaxants: Adrenaline, Isoprenaline, Salbutamol, Terbutaline 5) Drugs used in allergic reactions: Ephedrine 6) Local vasoconstrictor/ nasal decongestants: Phenylephrine, Pseudoephedrine, Naphazoline 7) Anorectics (↓ Appetite): Amphetamine, Phentermine.	
1	**i)**	**Give the structure and uses of haloperidol.** **Haloperidol structure:-**  **Haloperidol uses:-** • It is major tranquilizer and used to treat a. Acute schizophrenia b. Mania and hypomania c. Behavioral disturbances d. Sever anxiety e. Childhood development disorders. • It is used to control nausea and vomiting. • It potentiates the actions of CNS depressant like analgesics, barbiturates, and anesthetics. • It is used to treat intractable hiccupps.	**1 M Each**

1	j)	**Name the drug used for treatment of (any two)** **(i) Gout-** Diclofenac, Ibuprofen, Naproxen, Celecoxib, Allopurinol, Colchicine **(ii) Hypothyroidism-** Thyroxin sodium, Sodium liothyronine **(iii) Anxiety-** Diazepam, Lorazepam, Chlordiazepoxide, Nitrazepam, Oxazepam	**1 M Each**
1	k)	**Give stability storage condition of (any two)** **(i) Insulin-** 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. **(ii) Diethyl ether-** It is oxidized by atmospheric oxygen and is affected by light hence should be stored in well closed, light resistant container in a cool place. The label should bear • Very inflammable. • Do not use near an open flame. • Name and proportion of stabilizer added. • An antioxidant like propyl gallate or hydroquinone is added to prevent oxidation of ether to peroxides which are explosive and harmful. **(iii) Acetylcholine-** Keep it in well closed container, in a cool, dry place.	**1 M Each**
1	l)	**Draw structure for (any two)** **(i) Chloroquine** 	**1 M Each**

		(ii) Isoniazid  **(iii) Procaine** 	
2		**Attempt any FOUR of the following:**	**12M (4x3M)**
2	**a)**	**Define "General Anaesthetics". Draw structure and give chemical name of halothane.** **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. **Structure:**  **Chemical name-**2-bromo-2-chloro-1,1,1-trifluoro ethane.	**1 M Each**

2	b)	**Classify antimalarial with suitable examples.** **Classification-** • Quinine salts e.g. Quinine sulphate, Quinine phosphate, Quinine dihydrochloride. • 8-Aminoquinolines e.g. Pentaquine, Isopentaquine, Pamaquine, Primaquine. • 4-Aminoquinolines e.g. Chloroquine ,Amodiaquine. • 9-Aminoacridines e.g. Quinacrine, Mepacrine. • Biguanides e.g. Proguanil, Cycloguanil • Diaminopyrimidines. e.g. pyrimethamine. • Artemisinin & its derivatives. • Miscellaneous: - They are further classified as mentioned below a) Sulfones &sulfonamides. b) Antibiotics	**3 M**
2	c)	**Give structure, properties and uses of sulphadiazine**. **Structure of sulphadiazine**  **Properties of sulphadiazine-** • It is a white or whitish-yellowish crystalline powder. • It is soluble in solutions of alkali hydroxides & carbonates, & in dilute solutions of mineral acids, practically insoluble in water. **Uses of sulphadiazine-** • It eliminates bacteria that cause infections by stopping the production of folate inside the bacterial cell, and is commonly used to treat urinary tract infections (UTIs). • Silver sulfadiazine, a sulfa drug, is used to prevent and treat infections of second- and third-degree burns. It kills a wide variety of bacteria.	**1 M each**

2	**d)**	**Enlist the uses/functions of any three water soluble vitamins.**	**1½ M each**

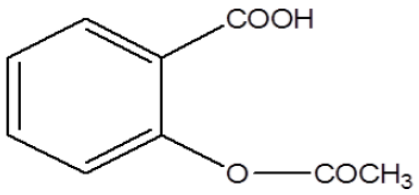
Name of Vitamin	**Actions and uses**
Thiamine/Vit. B1	To treat beriberi in man and polyneuritis in bird. Prosthetic group enzyme Synthesis of acetyl choline
Riboflavin/Vit. B2	To treat Skin lesion Component coenzyme for oxidation of carbohydrate and amino acid
Nicotinic acid/ Vit.B3	For prophylaxis & treatment Pellagra. Antilipidemic, Vasodilator
Pyridoxine/Vit. B6	To treat dermatitis, Epilepsy, aneamia, Nausea vomiting , Depression
Folic acid	To treat megaloblastic anemia In synthesis of DNA For normal production of RBC Mental Depression
Cyanocobalamine/ Vit. B12	To treat Pernicious anemia
Vitamin C	To prevent and treat scurvy To promote healing of wounds and fractures To facilitate formation of haemoglobin.

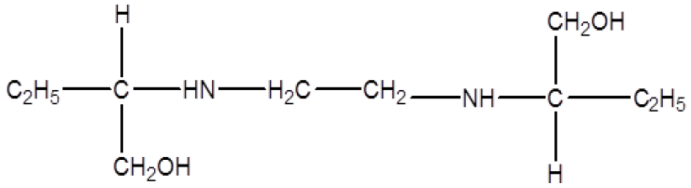
2	**e)**	**Give properties, therapeutic uses and official preparations of Atropine.** Properties- It occurs as colourless crystals or white crystalline powder. • It is odourless and has bitter taste. • It is sparingly soluble in water and freely soluble in chloroform.	**1M each**

		• It is official as sulphated salt which contains one molecule of water of crystallization and is very soluble in water. • When it is treated with fuming nitric acid and mixture is evaporated to dryness on water bath, it leaves yellow residue. • In acidic or alkaline medium, it is hydrolysed to give tropine and tropic acid. Therapeutic Uses: • In the treatment of Parkinsonism. Rigidity and tremor relieved by the apparently selective depressant action. • In the gastrointestinal tract to relieve pylorospasm, hypertonicity of the small intestine and the hypermotility of the colon. • To relieve hypertonicity of the uterine muscle. • To relax the spasm of biliary and uretered colic and bronchial spasm. • To diminish the tone of the detrusor muscle of the urinary bladder in the treatment of urinary tract disorders. • In the management of peptic ulcer. • In anesthesia to control excessive salivation and bronchial secretions. • To control rhinorrhea of acute rhinitis or hay fever. • As an antidote for pilocarpine, physostigmine, isoflurophate, choline esters, certain species of Aminata and in cases of anticholinesterase insecticide poisoning. Official preparations- • Atropine injectionB.P. I.P. • Atropine eye drops B.P. • Atropine eye ointment B.P., I.P. • Atropine sulphate tablets I.P.	
2	**f)**	**How anti-neoplastics are classified? Explain with examples.** **Classification:** 1) Alkylating Agents.	**3 M**

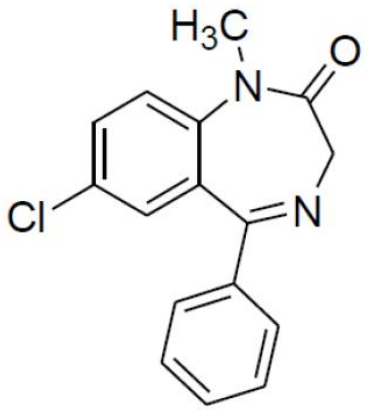
		a) Nitrogen mustard drugs: Mustine, Chormabucil, cyclophosphamide b) Aziridines: Thiotepa c) Alkyl sulphonate: Busulphan d) Nitrosourea group compound: Lomustine 2) Antimetabolites: Methotrexate, Mercaptopurine, Azathioprine, Fluorouracil 3) Antibiotics: Actinomycin, Daunorubicin, Doxorubicin 4) Plant Products: Sulphates of vinblastin and vincristine. 5) Hormones and related drugs: Glucocorticoids, Tamoxifen 6) Miscellaneous agents: Hydroxyurea, cisplatin.	
3		**Attempt any <u>FOUR</u> of the following**	**12M (4x3M)**
3	**a)**	**Explain the following terms (any three)** (i) **Antibiotic**: - are chemical substances produced by certain species of microorganisms and their synthetic analogues having the property of inhibiting the growth of or destroying other microorganisms in high dilutions or low concentration. (ii) **Hypnotic**:- These are the drugs which depress C.N.S. and produce sleep resembling natural sleep in normal dose. They are used to overcome insomnia. (iii) **Analeptic**: The drugs which increase the activity of various subunits or parts of central nervous system (brain and spinal cord) are called Analeptics or CNS stimulants. So it reduces narcosis brought about by excess of depressant drugs. (iv) **Diagnostic agent**: Diagnostic agents are the compounds used to detect impaired function of the body organs or to detect abnormalities in tissue structure. Usually they have no therapeutic value.	**1M each**
3	**b)**	**What are cardiovascular agents? Classify.** Cardiovascular agents represents a group of drugs which have direct action on heart or other parts of vascular system so that they modify the total output to the heart or the distribution of blood to certain parts of circulatory system. These drugs are used in the treatment of various cardiac diseases like hypertension, angina pectoris, arrhythmia, CHF, myocardial infarction etc.	**1 M**

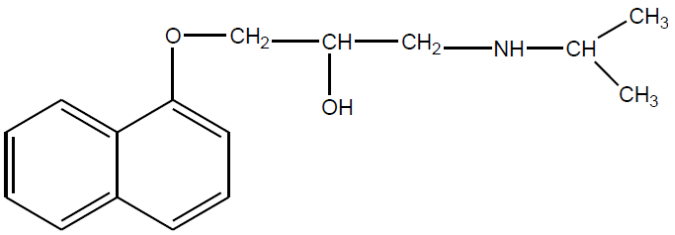
		Classification: **1) Cardiotonic drugs:** Cardiac glycosides obtained from Digitalis, stropanthus like Digoxin, Digitoxin, Gitoxin. **2) Antiarrhythmic agents:** a) Membrane stabilizing agent: - Quinidine, Procainamide, Diisopyramide, Phenytoin b) Beta blockers: Propranolol c) Drugs that prolong the duration of action potential:-Amiodarone d) Calcium channel blocker: Verapamil, Amlodipine, Diltiazem **3) Antianginal agents: -** a) Organic nitrates –Amyl nitrate, Glyceryl trinitrate, Isosorbid nitrate b) Calcium channel blocker:-Verapamil c) Beta blockers:-Propranolol 4) **Antihypertensive drugs: -** a) Centrally acting drugs:- alpha-methyl Dopa, Clonidine b) Ganglionic blockers - Pentolinium, Mecamylamine c) Adrenergic neuron blockers -Reserpine, Guanethidine d) Beta blockers: - Propranolol, Atenolol e) Alpha blockers: - Prazocin, Tolazoline f) Direct acting vasodilators -Hydralazine ,Minoxidil g) Calcium channel blocker:-Verapamil, Diltiazem, Nifedipine h) Angiotensin converting enzyme inhibitors:-Captopril, Enalapril, Lisinopril **5) Antihyperlipidemic drugs:-**Clofibrate, Simvastatin, Atorvastatin **6) Anticoagulants:-**Heparin **7) Antiplatelet agents:-**Aspirin **8) Diuretics:-**Frusemide**,** Thiazides	**2 M**
3	**c)**	**Classify Antiseptic and Disinfectant, with suitable examples.** **Classification**:- 1) Phenols & related compounds: E.g.Phenol, Chlorocresol. Chloroxylenol, Hexachlorophene 2) Alcohols & aldehydes : E.g Alcohol, Formaldehyde	**3 M each**

		3) Halogen compounds : E.g Chloramine t, Chorhexidine acetate, Dibromopropamidine 4) Organic mercurials: E.g Merbromin (mercurochrome), Thiomersal 5) Dyes: E.g Aminacrine hydrochloride, Brilliant green, Proflavine hemisulfate, Crystal Violet (gentian violet), Acriflavine. 6) Cationic surface-active agents. E.g Cetylpyridinium chloride, Benzalkonium chloride, Cetrimide 7) Miscellaneous agents. E.g Dequalinium chloride, Nitrofurazon	
3	**d)**	**Draw structure and give properties and uses of Aspirin.** **Structure:**  **Properties**: 1. It is a colorless, odorless, crystalline powder. 2. It is soluble in water, alcohol, chloroform & ether. 3. It is stable in dry air, but gradually hydrolyses in contact with moisture to acetic acid & salicylic acid. 4. It also gets decomposed by alkali hydroxides & carbonates. **Uses**: 1. It is a salicylate drug, often used as an analgesic to relieve minor aches and pains. 2. It is used as an antipyretic to reduce fever. 3. It is used as an anti-inflammatory medication. 4. Aspirin also has an antiplatelet effect & so aspirin is used at low doses, to help prevent heart attacks, strokes, and blood clot formation in people at high risk for developing blood clots.	**1M each**
3	**e)**	**Enlist different antitubercular agents and draw structure and give properties of Ethambutol.** **Antitubercular agents**:- Isoniazid, Rifampin, Ethambutol, Pyrazinamide, Streptomycin,	**1 M Each**

		Thioacetazone, Ethionamide, Kanamycin, capreomycin, Cycloserin, Para amino salicylic acid, Clarithromycin, Thioacetazone. **Structure**:-  **Properties**:- 1. It is white, odorless, crystalline powder. 2. It is bitter in taste. 3. It is freely soluble in water and alcohol, slightly soluble in chloroform, practically insoluble in ether.	
3	**f)**	**Define Anthelmentic. Give properties and uses of mebendazole.** **Definition:** Anthelmintics are the drugs which are used to combat or oppose any type of helminthiasis or helminthic infection**. OR** The anthelmintics are the drugs used to kill or remove the parasitic worms. **Properties:-** i) It is white to slight yellow amorphous powder ii) It is odorless iii) It is practically insoluble in water, chloroform and ether, it is freely soluble in formic acid. **Uses of Mebendazole :** It is broad spectrum anthelmintic. It is used to treat- i) Whipworm infestation (Trichuriasis) ii) Round worms infestation (Ascariasis) iii) Tape worms infestation (Taeniasis) iv) Thread worm infestation.	**1M Each**

		v) Hook worm infestation vi) Guinea worm infestation vii) Capillaria infection	
4		**Attempt any <u>FOUR</u> of the following**	**12M (4X3M)**
4	**a)**	**Classify Tranquilisers with examples** **Classification:** 1. Major Tranquilizers or antipsychotics: a) Phenothiazines: E.g Chlorpromazine, Pochlorperazine, Trifluoperazine b) Butyrophenones: E.g Haloperidol, Trifluperidol c) Rauwolfia Alkloid: E.g Reserpine d) Others: E.g Thioxanthenes, Oxypertine. 2. Minor Tranquilizers: a) Benzodiazepines: E.g Diazepam, Chlordiazepoxide, Lorazepam, Nitrazepam, b) Carbamate: E.g Meprobamate c) Miscellaneous: E.g Hydroxyzine lithium carbonate **OR** **Classification:** Tranquilizers are classified as follows 1. Phenothiazine derivatives and related tricyclic compounds a. Phenothiazine derivatives: E.g Chlorpromazine, prochlorperazine, trifluroperazine. b. Thioxanthenes : E.g chlorprothixene, fluepenthixol 2. Butyrophenones : E.g haloperidol, trifluoperidol 3. Dibenzodiazepines : E.g clozapine 4. Benzamides and salicylamides : E.g sulpiride 5. Diphenylbutyl piperdine derivatives: E.g pimozide 6. Miscellaneous: E.g Reserpine	**3 M**

4	b)	**Give structure, properties, and uses of Diazepam.** **Structure**:-  **Properties**:- 1. It occurs as a white or pale yellow crystalline powder. 2. It is odorless or almost odorless and tasteless at first followed by bitter taste. 3. It is sparingly soluble in water, soluble in alcohol. **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	**1M each**
4	c)	**Define Coagulant and Anticoagulant with one example of each.** **Coagulants** Coagulants are the agents which bring about coagulation of blood. They are employed in the treatment of hemorrhagic or threatened hemorrhagic conditions. Such hemorrhagic conditions are caused by many factors, such as platelet defects, plasma coagulation disorder, excessive use of anticoagulant therapy etc. **Example of coagulant:** Dried thrombin Thrombin Human fibrinogen Protamine sulphate	**1 M** **0.5 M**

		Menadione **Anticoagulants**: - The drugs which are able to prolong coagulation time of blood are called anticoagulants. They are used prophylactically and therapeutically in treatment of thrombo-embolic occlusive vascular diseases like venous, thrombosis, pulmonary embolism, and cardiac infarction. **Example of Anticoagulants** :- Heparin Dicoumarol Nicoumalone Phenindione Warfarine	**1 M** **0.5 M**
4	**d)**	**What are sympatholytics? Write structure and uses of propranolol.** The drugs which block response to endogenous or exogenous circulating epinephrine or which block response to adrenergic nerve stimulation or which prevent release of adrenergic transmitter substance at sympathetic nerve endings are called as Sympatholytic or antiadrenergic drugs. **Structure:-**  **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.	**1M** **2M**

4	e)	**Enlist different sex hormones in human body. Explain the role and uses of testosterone.** Three main types of sex hormones are 1) Androgenic or anabolic steroids 2) Oestrogens 3) Progestogens. **Role of sex hormones:-** Sex hormones are the hormones which are produced mainly in gonads, ovaries or testes. They influence the development and directly or indirectly associated with reproduction. 1) **Androgenic or anabolic steroids** - The androgens are mainly able to maintain the development and maintenance of the secondary male sex characters, thereby increasing virility and libido. The androgens are also able to increase nitrogen and water retention and stimulate skeletal growth. 2) **Oestrogens** - Oestrogens influence development and maintenance of secondary female sex characters. These are also able to control cyclic changes to which uterus and vagina are subjected during menstrual cycle. They are also essential for maintenance of pregnancy. They also exert anabolic effect on protein metabolism & water retention. 3) **Progestogens**. Progestogens are necessary for various changes takes place in uterus & vagina during menstrual cycle, for developing mammary tissue and for maintain pregnancy. **Uses of testosterone** 1) Used in male for replacement therapy in hypogondism, eunuchoidism and delayed puberty in adolescent males. 2) Used in treatment of gynaecomastia. 3) Used in palliative treatment of disseminated breast cancer in postmenopausal women.	**1 M each**
4	f)	**Give medicinal uses of (any three)** **(i) Tetracycline** 1. Treatment of infection of CNS and urinary system. 2. It is active against gram positive and gram negative bacteria. 3. Treatment of infection of chest, soft tissue, superficial infection. 4. It has also application in treating malaria, typhus, pneumonia etc	**1M each**

(ii) Cetrimide

1. Antiseptic
2. Treatment of wounds, burn
3. Detergent action
4. Active against gram positive organisms.
5. Emulsifying agent, preservative.

(iii) Diphenhydramine:

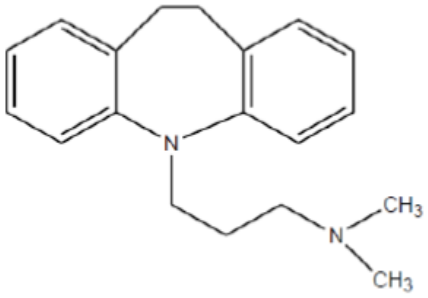
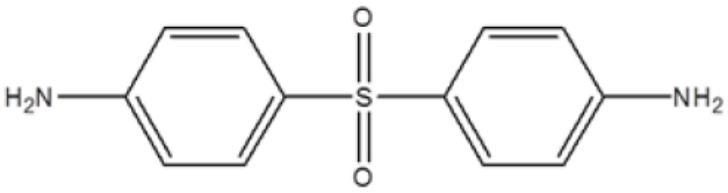
1. Diphenhydramine is an antihistaminic agent.
2. It is used in various allergic conditions.
3. Orally and intravenously it is useful in the treatment of urticaria, hay fever, bronchial asthma.
4. Treatment of common cold and it is a constituent of cough mixtures
5. It has pronounced sedative properties, antiemetic action.
6. It is also used to control parkinsonian symptoms.

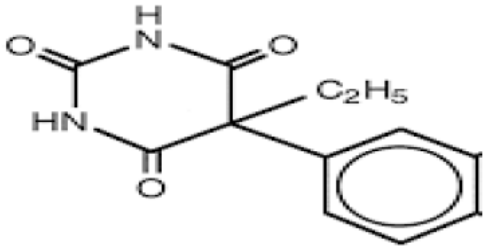
(iv) Ethambutol

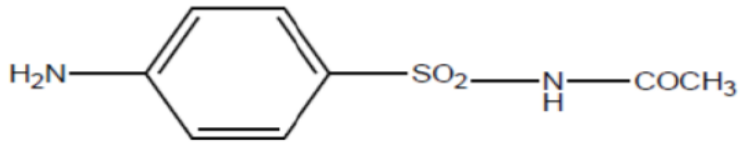
1. It has a bacteriostatic action against mycobacteria
2. Used in combination with other anti-tubercular drugs like Pyrazinamide, Isoniazid and Rifampin.

(v) Ranitidine

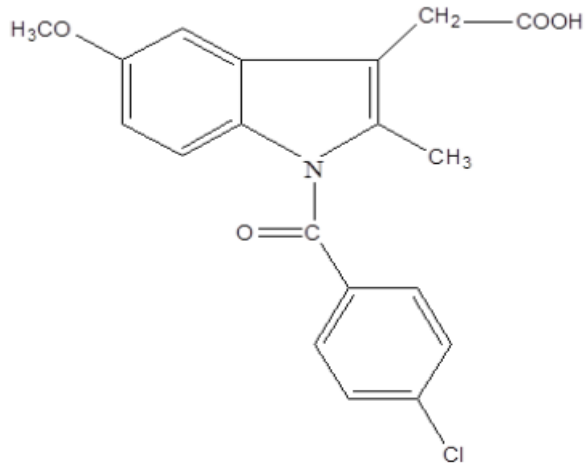
1. Ranitidine is used to treat ulcers of the stomach and intestines and prevent them from coming back after they have healed.
2. This medication is also used to treat erosive esophagitis, gastroesophageal reflux disease-GERD, Zollinger-Ellison syndrome.

5		**Attempt any <u>FOUR</u> of the following**	**12M (4X3M)**
5	**a)**	**Draw structure and give chemical name & medicinal uses of Imipramine.** **Imipramine:**  **Chemical name: 5-(3-Dimethylamino)propyl-10,11-dihydrodibenzoazepine** **Medicinal 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	**1 M Each**
5	**b)**	**What is "Leprosy"? Give structure and properties of drug used in Leprosy.** **Leprosy:** • Leprosy is chronic, contagious disease caused by slow growing bacteria, Mycobacterium Leprae. • It was first identified by Hansen in 1871 and also called as Hansen's disease. • It affects the skin, mucous membranes and nerves causing discoloration and lumps on skin and, in severe cases disfigurement and deformities. **Drug used in Leprosy:** **Dapsone:** 	**1 M Each**

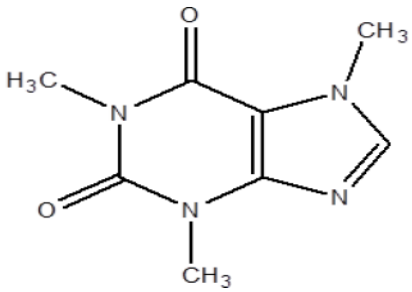
		Properties: 1. It is white or slightly white crystalline powder. 2. It is odorless. 3. It is bitter in taste, practically insoluble in water, soluble in alcohol, freely soluble in acetone and dilute mineral acids.	
5	**c)**	**Give structure, properties and brand name of Phenobarbitone.** **Phenobarbitone:**  **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. **Brand names:** Luminal, Gardenal, Pheno, Phenoson, Barbit, Berdinal	**1 M Each**
5	**d)**	**Define Anti-depressants. Give properties & uses of Amitryptyline.** **Anti-depressants:** Antidepressants are drugs which counteract or overcome mental depression. These drugs are therapeutically useful in a variety of cases pertaining to mentally ill patients. Mental depression is a phenomenon which may arise in normal individuals or in mentally ill persons. **Amitryptyline (Amitriptyline):** **Properties:** 1. It is colourless crystals or white or almost white powder. 2. It is almost odourless. 3. It is freely soluble in water, in ethanol (95%), in chloroform and in methanol; practically insoluble in ether.	**1 M each**

		Uses: 1. Antidepressant. 2. It is used in treatment of mental depression. 3. It is also used in treatment of nocturnal enuresis in children.	
5	**e)**	**Classify Antihistaminic agents with examples.** **Classification:** **1) H_1 receptor antagonist :-** **a) Amino alkylethers :** E.g**.** Diphenhydramine **b) Ethylenediamines :** E.g Mepyramine , Tripelennamine **c) Alkyl amines:** E.g Pheniramine, Chlorpheniramine, Bromopheniraime, Triprolidine. **d) Phenothiazine derivatives :** E.g Promethazine, Trimeprazine **e) Piperazine derivative :** E.g Cyclizine, Chlorcyclizine, Meclizine, Buclizine, **f) Miscellaneous:** E.g Cyproheptadine, Diphenylpyraline, Phenindaminetartarate, Antazoline. **2) H_2 receptor antagonist**: -E.g Cimetidine, Ranitidine, Burimamide, Metiamide.	**3 M**
5	**f)**	**Draw structure of (any three)** **(i) Sulfacetamide:** 	**1 M each**

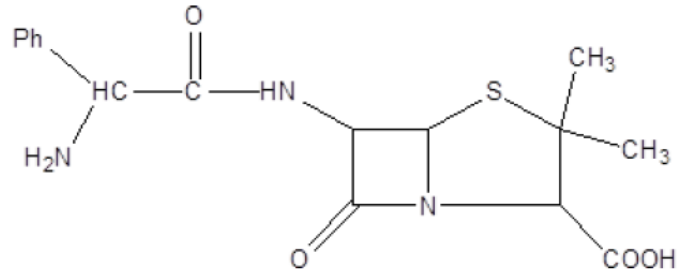
(ii) Indomethacin:



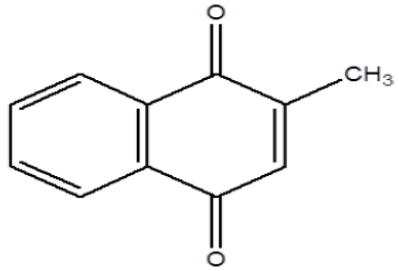
(iii) Caffeine:



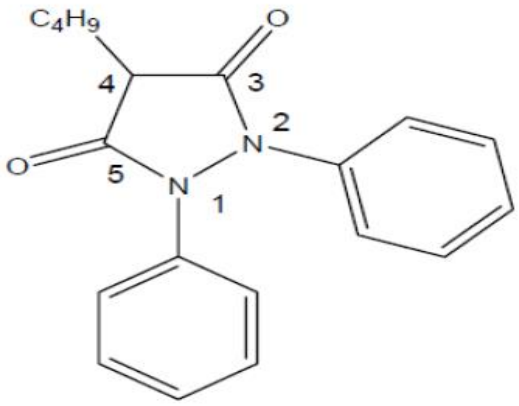
(iv) Ampicillin:

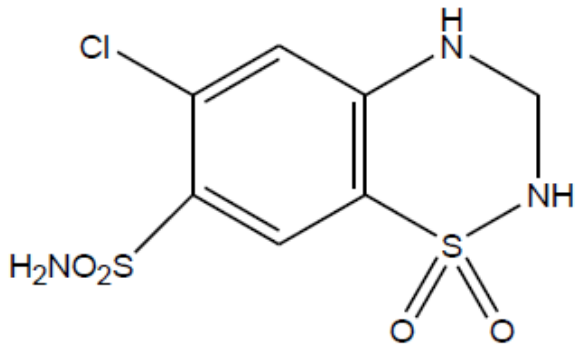


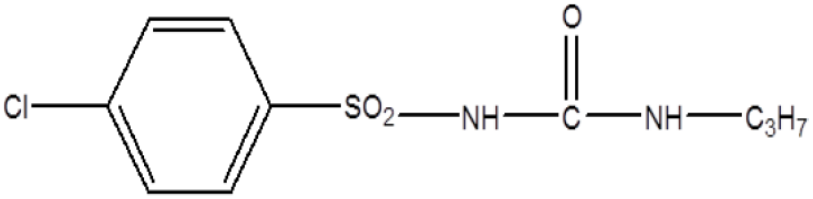
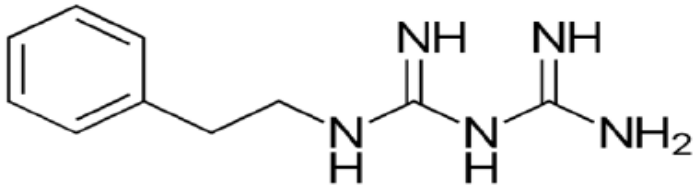
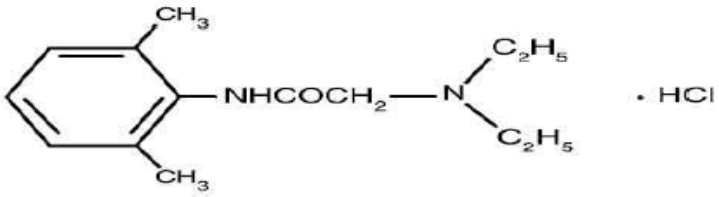
(v) Menadione:



6		**Attempt any FOUR of the following**	**16M (4X4M)**
6	**a)**	**Classify Antihypertensive agent with examples.** **Classification:** 1. **Drugs affecting the sympathetic tone:** • Drugs that alter central sympathetic activity Clonidine , Methyl Dopa • Adrenergic neuron blockers : Guanethidine, Reserpine • α- adrenoceptor blocking agents : Prazosin, Phentolamine • β – adrenoceptor blocking agents : Propranolol, Atenolol **2. Vasodilators** : • Direct Vasodilators : Hydralazine, Minoxidil • Calcium channel blockers: Nifedipine, Verapamil **3. Agents acting on renin-angiotensin system:** • Renin inhibitors, Angiotensin antgonists eg: Saralasin • Angiotension converting enzyme inhibitor : Captopril, Enalapril **4. Diuretics :** • Thiazides : Hydrochlorthiazide • Loop diuretics : Furosemide • Potassium Sparing Diuretics : Traiamterene	**4 M**
6	**b)**	**Explain Anti-inflammatory agent. Give name, structure and properties of pyrazole containing anti-inflammatory agent.** Anti-inflammatory agent is the substance used in treatment of inflammation or swelling or treatment that reduces inflammation or swelling. It is of mainly classify into two types: a) Steroidal anti-inflammatory agent: Prednisone, Cortisone etc. b) Non-steroidal anti-inflammatory agent: Aspirin, Ibuprofen etc. A variety of safe and effective anti-inflammatory agents are available, including aspirin and other nonsteroidal anti-inflammatories. NSAID is an abbreviation for a group of agents called Non Steroidal Anti-inflammatory Drugs.	**1 M Each**

		These drugs are used to decrease inflammation caused by various reasons like oedema, erythema, pain and chronic inflammation in rheumatoid arthritis etc. **Name of pyrazole containing anti-inflammatory agent: Phenylbutazone** **Structure:**  **Properties:** 1. It is white or almost white crystalline powder. 2. It is odourless. 3. It is freely soluble in chloroform and in acetone, soluble in ether, sparingly soluble in in ethanol (95%), practically insoluble in water and it dissolve in solutions of alkali hydroxides.	
6	**c)**	**Classify diuretics with suitable examples and Draw the structure of Hydrochlorothiazide.** **Classification - I:** • Water& Osmotic diuretic. E.g. mannitol and urea • Carbonic anhydrase inhibitors (sulfonamides). E.g. Acetazolamide, Methazolamide • Acidifying drugs. E.g. Ammonium chloride. • Mercurial agents. E.g.Mercaptomerin • Thiazides diuretics. E.g .Chlorothiazide, Chlorothalidone, Hydrochlorothiazide • Miscellaneous i. Potassium sparing diuretics- e.g.Triamterene, amiloride ii. Aldosterone antagonist- e.g. Spironolactone	**3 M classify**

		iii. High ceiling diuretics/ Loop diuretics E.g. Furosemide, Ethacrynic acid **OR** **Classification- II:** • Weak diuretics a) Osmotic diuretics- Urea, sodium and potassium salts b) Non electrolytes- Mannitol, Glucose c) Carbonic Anhydrase Inhibitors - Acetazolamide, Methazolamide, d) Xanthine derivatives- Caffeine, Theophylline, Theobromine • Moderately potent diuretics: Chlorothiazides, Hydrochlorothiazide, Benzothiazides • Very potent/ loop/ high ceiling diuretics: Frusemide, Ethacrynic acid • Potassium sparing diuretics: Triamterene, Amiloride, • Aldosterone blocking agents- Spironolactone • Antidiuretic hormone: Lithium salts • Miscellaneous: Ammonium chloride, Calcium chloride **Structure of Hydrochlorothiazide:**  	**1M**
6	**d)**	**What is diabetes mellitus? Name three oral hypoglycemic agents. Give properties & structure of Chlorpropamide or Phenformin** **Diabetes mellitus:** Diabetes mellitus is a metabolic disorder characterized by hyperglycaemia usually associated with polyphagia, polydypsia; polyuria, glycosuria, weight loss, dehydration etc. caused due to deficiency or diminished effectiveness of insulin (insulin resistance). **Name three oral hypoglycemic agents:**	**1 M Each**

		Chlorpropamide, Tolbutamide, Glibenclamide, Phenformin, Metformin **Structure of Chlorpropamide:**  **Properties of Chlorpropamide:** 1. It occurs as odorless, white crystalline powder, tasteless. 2. It is practically insoluble in water, but soluble in alcohol, alkalis. **Or** **Structure of Phenformin:**  **Properties of Phenformin:** 1. It is an odorless, white crystalline powder with bitter taste. 2. It is freely soluble in water and soluble in alcohol.	
6	**e)**	**Draw structure, and Give properties, storage condition & uses of Lignocaine.** **Structure:**  **Physical Properties:** 1. It's hydrochloride salt occurs as white crystalline powder 2. It is odourless. 3. It has slightly bitter numbing taste. 4. It is very soluble in water, freely soluble in alcohol and soluble in chloroform.	**1 M each**

		Storage Condition: Store in well closed container at cool place. **Uses:** 1. It is used as local anaesthetics in forms of injection for systemic and cream, ointments, sprays for surface anaesthesia. 2. It is also used in treatment of ventricular tachyarrthymias especially those associated with myocardial infarction.	
6	**f)**	**Give medicinal uses of (Any four)** **(i) Ampicillin:** 1. Ampicillin is used to treat a wide variety of bacterial infections. 2. It is used to treat Respiratory Tract Infections. 3. It is used to treat Bacterial Meningitis. 4. It is used to treat Septicaemia and Endocarditis. 5. It is used to treat Urinary Tract Infections. **(ii) Neostigmine:** 1. It is used in the treatment of myasthenia gravis. 2. It reduces the heart rate and lowers the blood pressure by peripheral vasodilation. **(iii) Cephalin:** 1. Antibacterial agent. 2. Treatment of gram positive and gram negative bacteria 3. Bacterial infection of skin, bone, joint, ear, urinary tract. **(iv) Guanethidine:** 1. It is used in the treatment of hypertension in conjunction with diuretics or other antihypertensive agent. **(v) D. E. C:** 1. This drug is categorized as an anthelmintic, particularly anti filarial 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.	**1 M Each**

		(vi) Congo red: 1. Employed as a diagnostic aid in amyloidosis (In medicine, amyloidosis refers to a variety of conditions in which amyloid proteins are abnormally deposited in organs and/or tissues.) 2. Also used as an indicator in lab.	