MODEL ANSWER

SUMMER– 17 EXAMINATION

Subject Title: Pharmaceutical Chemistry-I **I** Subject Code: 0812

Important Instructions to examiners:

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

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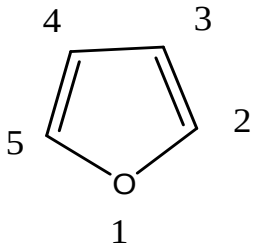
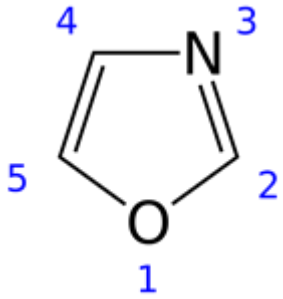
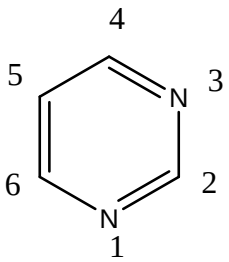
Q. No.	Sub Q. N.	Answer	Marking Scheme
1.		**Attempt any <u>FIVE</u> of the following:**	5x4=20marks
	a)	**Draw structure and give method of numbering. (Any four):**	1 mark each
		(i) Furan 	
		(ii) Oxazole 	
		(iii) Pyrimidine 	

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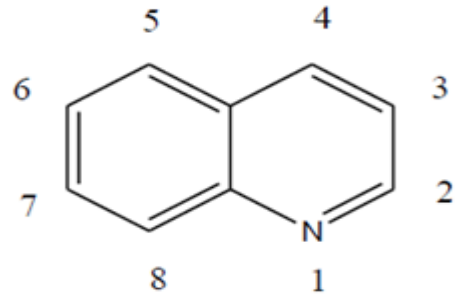
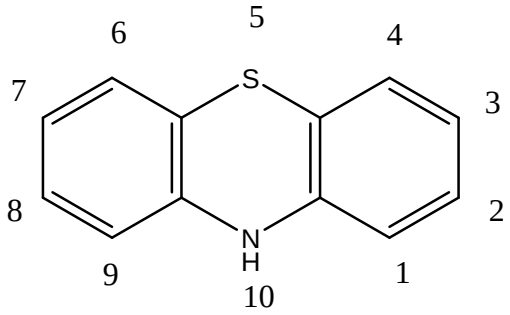
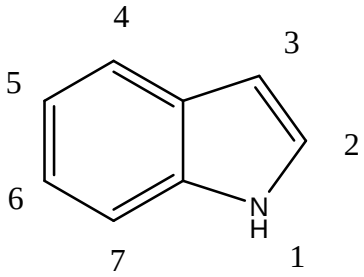
(iv) Quinoline



(v) Phenothiazine



(vi) Indole



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	b)	**Define the following terms. (Any four):** **(i) Local anaesthetics -** 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 fibers and nerve ending and the effects are reversible. **(ii) Anthelmintics -** The drugs which are used to kill or remove the parasitic worms, the term anthelmintic should not be restricted just to drugs acting locally to expel worms from the g.i.t. Various types of worms are able to penetrate tissues, & the drugs used to act against systemic infections should be included also under the general term anthelmintic. **(iii) Anticoagulants -** An anticoagulant is a substance that prevents coagulation; that is, it stops blood from clotting & anticoagulants are given to people to stop thrombosis (blood clotting inappropriately in the blood vessels). **(iv) Diagnostic agents -** These are the agents or chemicals used to detect abnormalities in tissues & organs or to test an organ function, these are thus useful for the clinical diagnosis of the diseases & these agents do not usually have any medicinal values or pharmacological effect. **(v) Sympathomimetics -** Drugs that mimic the actions obtained as a result of stimulation of the sympathetic or adrenergic nerves are called Sympathomimetics. **OR** The drugs that produce pharmacological effects like adrenaline or nor adrenaline or drugs which bring about stimulation of adrenergic nerves are called Sympathomimetics. **(vi) Diuretics -** Drugs which promote excretion of water & electrolytes from body through kidneys in the form of urine are called diuretics.	1 mark each

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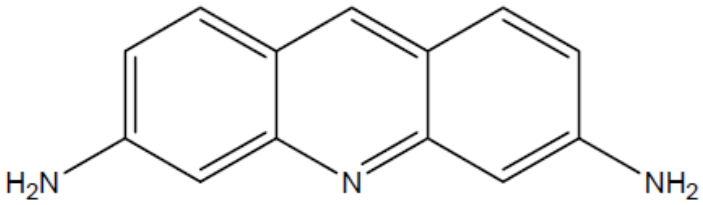
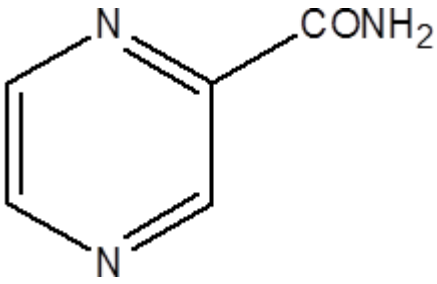
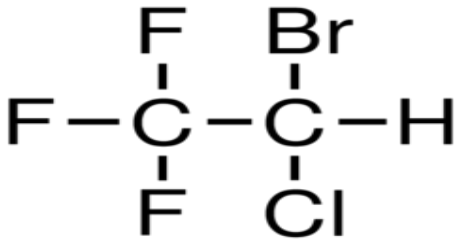
	c)	**Write structure of (Any four):** **(i) Proflavine**  **(ii) Pyrazinamide**  **(iii) Halothane**  	1 mark each

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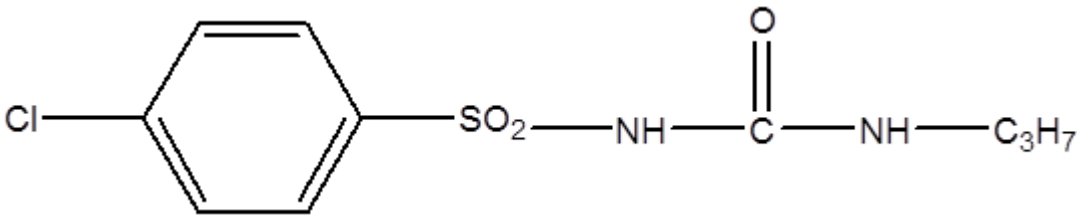
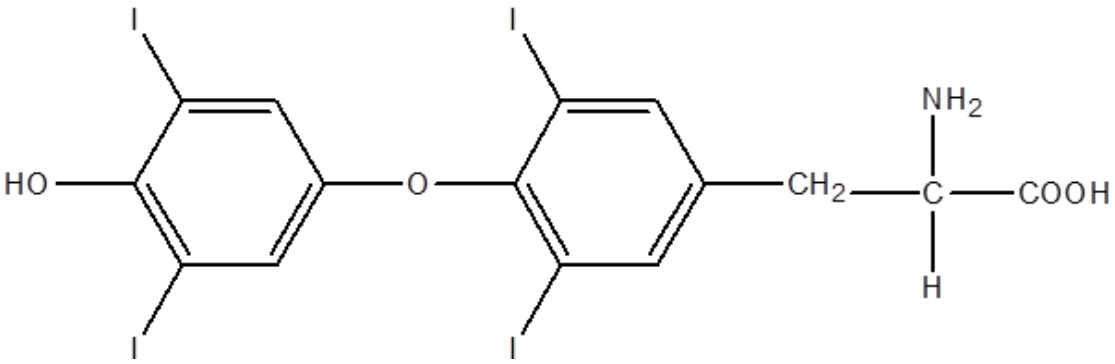
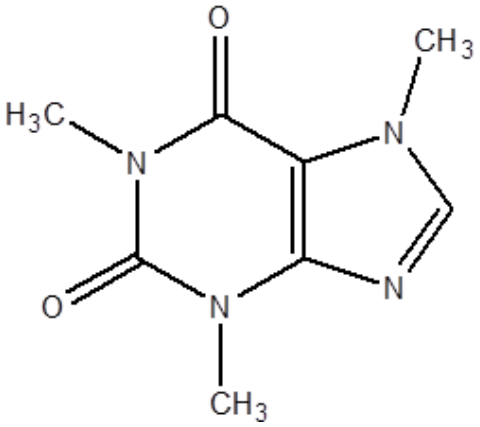
(iv) Chlorpropamide



(v) Thyroxine



(vi) Caffeine



d) **Define antimalarials, Classify them with suitable examples and give the structure of Pyrimethamine.**

Anti-malarial drugs: - The drugs which are used in the treatment of malaria caused due to Plasmodium Species like Plasmodium Vivax, P. falcifrum, P.malariae, P. ovale are called as Anti-malarial drugs.

1 mark definition

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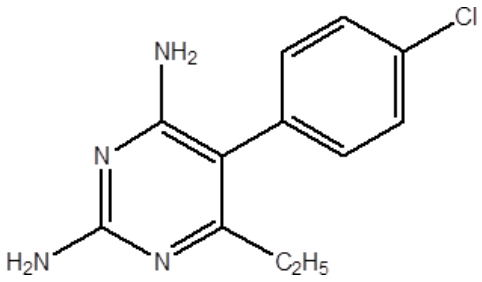
		Classification: • Quinine salts e.g. Quinine sulphate, Quinine phosphate, Quinine dihydrochloride. • 8-Aminoquinolines e.g. Pentaquine, Isopentaquine, Pamaquine, Primaquine. • 4-Aminoquinolines e.g. Chloroquine , Amodiaquine. • 9-Aminoacridines e.g. Quinacrine, Mepacrine. • Biguanides e.g. Proguanil, Cycloguanil • Diaminopyrimidines. e.g. pyrimethamine. • Artemisinin & its derivatives. • Miscellaneous: - They are further classified as mentioned below a) Sulfones & sulfonamides. b) Antibiotics  **Structure of Pyrimethamine**	2 marks classification 1mark str.
e)		**Write physiological actions of histamine. Classify antihistaminics with examples.** • 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.	2 marks physiological actions, 2 marks classification

Physiological actions of histamine on various organs:

- Blood vessels: Histamine causes dilation of blood vessels
- Smooth muscle: It causes contraction of smooth muscle (Contraction of bronchi)
- Excretory glands: Histamine has stimulant action on excretory glands. It increases nasal, lachrymal and bronchial secretion.
- Acid secretion: Histamine increases acid secretion in stomach which causes peptic ulcer
- Oedema: Excess secretion of histamine causes accumulation of fluid and water in the body.
- Allergy: It plays an important role in human allergy and allergic reactions.

Classification of antihistaminics:

1. H1 blockers or H1 antagonist:

   a) Aminoalkylethers/Ethanolamines e.g. Diphenhydramine, Doxylamine

   b) Ethylenediamine e.g.Mepyramine, Tripelennamine, Pyrilamine

   c) Alkylamines/Propylamines e.g. Pheniramine, Chlorpheniramine, Triprolidine

   d)Phenothiazine derivatives e.g. Promethazine, Trimeprazine

   e) Piperazine derivatives. e.g Meclizine, Cyclizine, Chlorcyclizine

   f) Dibenzocycloheptenes: Cyproheptadine, Azatadine

   g) Second generation antihistaminics: e.g. Cetrizine, Levocetrizine, Fexofenadine, Terfenadine

2. H2 Blockers or H2 receptor antagonist

   e.g. Ranitidine, Cimetidine, Famotidine

3. An inhibitor of histamine release

   e.g.Sodium Cromoglycate

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	f)	**Define vitamins. Write the important uses of vit. A, Nicotinic acid and ascorbic acid.** 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. **Uses of Niacin or Nicotinic acid-** ➢ It is used for preventing vitamin B3 deficiency and related conditions such as pellagra. ➢ Biochemically active form of Nicotinic acid is NAD (Nicotinamide adenine dinucleotide) and its phosphate (NADP). These two coenzymes are required in protein and amino acid metabolism and electron transfer reaction in respiratory chain. ➢ It causes peripheral vasodilation ➢ Large dose of nicotinic acid decreases serum cholesterol level. **Uses of Vitamin A-** ➢ It is used for treating vitamin A deficiency. ➢ Prevention and treatment of Night blindness, Xerophthalmia and keratomalacia. ➢ Vit. A is important for growth, development and maintenance of immune system. ➢ Some people use vitamin A for improving vision and treating eye disorders including age-related macular degeneration (AMD), glaucoma and cataracts. ➢ Vitamin A is also used for skin conditions including acne, eczema, psoriasis, cold sores, wounds, burns, sunburn. **Uses of Ascorbic acid-** ➢ In general this drug is used for the prevention and treatment of scurvy. This condition is caused by a lack of vitamin C often due to a lack of fresh fruit and vegetables. Symptoms of scurvy include a general feeling of being unwell, tiredness, muscle and joint pain, bleeding into the skin, around bones, into joints and from the gums, and loose teeth. ➢ Ascorbic acid is involved in many redox reactions	1 mark each.

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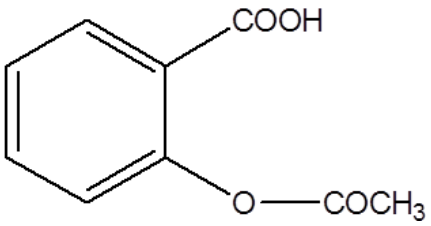
		➢ It is essential for development of cartilage, bones and teeth and maturation of RBCs. ➢ It plays an important role in healing of wounds. ➢ Ascorbic acid increases absorption of iron.	
	g)	**Give the structure and uses of** **(i) Aspirin**  **Uses of aspirin** ➢ Analgesic: to relieve minor aches and pains, as an antipyretic to reduce fever, and as an anti-inflammatory medication. ➢ Antipyretics: It helps to decrease elevated body temperature. ➢ It is also used as an anti-inflammatory drug. ➢ Antiplatelet agent: It helps to prevent formation of thrombus or platelet aggregation hence, it prevents heart attacks, strokes, and blood clot formation in people at high risk for developing blood clots.	1 mark each

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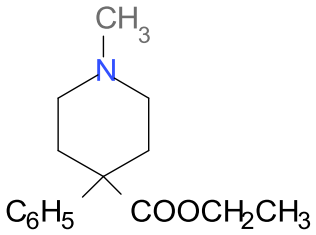
		(ii) Pethidine  **Uses of Pethidine-** ➢ Analgesic activity: It is used in the treatment of severe pain like labor pain. ➢ Spasmolytic agent: Pethidine is useful in the treatment of spasm of intestine, urinary bladder ➢ Used as a substitute for morphine for the relief of most types of moderate to severe pains. ➢ Used in combination with chlorpromazine & promethazine to produce narcosis. ➢ It also produces mild euphoria.	
	h)	**Give storage conditions for** **(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) Cyclopropane** • 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.	2 marks for each

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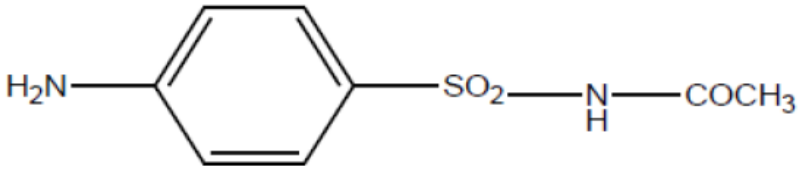
2.		**Attempt any THREE of the following:**	
	a)	**Write structure, chemical name and uses of Sulfacetamide.**	3x4=12marks 1 mark str. 1mark chemical name 2 marks uses
		 **Chemical name- N^1- acetyl sulfanilamide** **Uses of Sulfacetamide-** ➢ It is mainly used for eye infections. Sulfacetamide sodium is used in the treatment of Conjunctivitis, Trachoma. ➢ It is also useful in urinary tract infections. ➢ Topically it is used for the treatment of acne and seborrhic dermatitis	
	b)	**Classify the antibiotics with examples from each class. Write the structure of Penicillin G.** **Chemical Classification:** A) Beta lactam antibiotics i) Penicillins ii) Cephalosporins B) Non-Beta lactam antibiotics • Aminoglycoside antibiotics– e.g. Streptomycin, Gentamycin, Linomycin • Polypeptide antibiotics – e.g Bacitracin • Polyene antifungal antibiotics – e.g. Nystatin, Amphotericin • Macrolide antibiotics – e.g. Erythromycin • Ansamycin – e.g. Rifamycin • Tetracyclines – e.g. Tetracycline, Oxytetracycline, Chlortetracycline • Fluoroquinolones- Ciprofloxacin, Ofloxacin etc.	3 marks classification 1 mark structure

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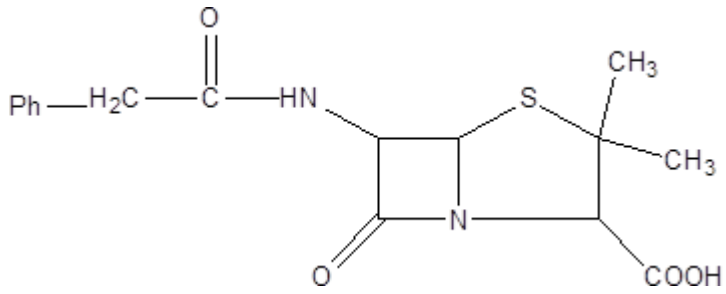
		• Miscellaneous –e.g. Griseofulvin, Chloramphenicol, Sodium fusidate **Structure of penicillin G**  	
c)		**Give the classification of antineoplastic agents.** **Classification:** 1. Alkylating Agents. a) Nitrogen mustard drugs: Mustine, Chormabucil, cyclophosphamide b) Aziridines: Thiotepa c) Alkyl 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, cisplatin	4 marks classification

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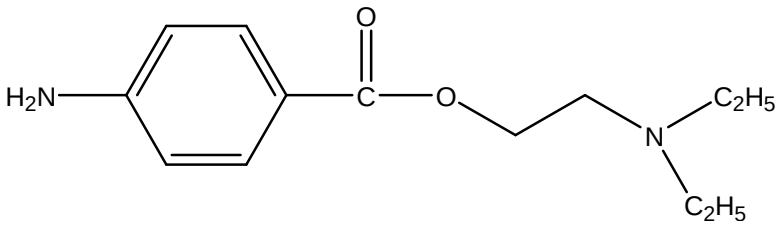
d) Write the difference between general anaesthetics and local anaesthetics. Give the structure and chemical name of procaine.

2 marks for differences

1 mark each for str.& chem.name

Structure of procaine



Chemical name - 4-amino-(2-diethyl amino ethyl) benzoate or 2-(Diethyl amino) ethyl-4-amino benzoate.

Distinguish between general anaesthetics and local anaesthetics

GENERAL ANAESTHETICS	LOCAL ANAESTHETICS
1. General anaesthetics are the agents which bring about loss of all modalities of sensation, particularly pain, along with a reversible loss of consciousness. .	It may be defined as any substance applied topically or by localized injection or infiltration to dull or block pain sensation.
2. General anesthesia is induced either by inhalation of volatile & gaseous anesthetics like diethyl ether, halothane or parenteral administration of intravenous anesthetics like thiopentone sodium.	Local anesthesia is induced by topical application of drugs to skin or mucous membrane (surface anesthesia) or by injection into area subjected to surgical operation (infiltration anaesthesia) or injection into dual membrane of spinal cord (spinal anesthesia)
3. General anaesthesia is produced before carrying out surgical operation or in obstetrics.	Local Anaesthesia is produced in short surgical procedures & in dentistry.
4.Care of Vital organs essential	Care of Vital organs is not essential

		5. E.g. halothane ,cycloprapane etc. | E.g. procaine, lignocaine, benzocaine	
	e)	**Define and classify antihypertensive drugs.** Any agent used for reducing elevated blood pressure is known as antihypertensive agent or hypotensive agent. Antihypertensive agents can be classified as follows below:- a) Centrally acting agents: e.g. α-methyldopa, clonidine b) Ganglion blockers : e.g. Pentolinium, Mecamylamine 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, enalapril maleate.	1 mark definition 3 marks classification

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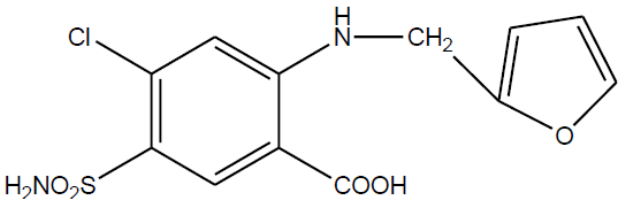
3.		**Attempt any THREE of the following:**	3x4=12 Marks
	a)	**Write the general uses of diuretics. Give the structure and brand names of frusemide.**	
		General uses of Diuretics:- Diuretics are used to treat several conditions in medicine. Following are the conditions where diuretics are used • Hypertension or high blood pressure, Acute left ventricular failure or heart failure • Most types of oedema (renal oedema, oedema of pregnancy) or fluid accumulation • Acute renal failure and treatment of kidney stones • To excrete toxins and toxic metabolites out of the body. • To decreases intraocular pressure in glaucoma. • Treatment of hypercalcemia and hyperkalemia **Frusemide:** Lasix, Fru, Frusenex, Tebemid etc. **Structure of frusemide:-**  	2 marks uses 1 mark Brand names 1 Mark Structure
	b)	**Define and classify NSAIDs.** NSAIDs is an abbreviation for a group of agents called Non Steroidal Anti-inflammatory Drugs. Definition :- These drugs are used to decrease inflammation caused by various reasons like oedema, erythema, pain and chronic inflammation in rheumatoid arthritis etc.	1 Mark Define

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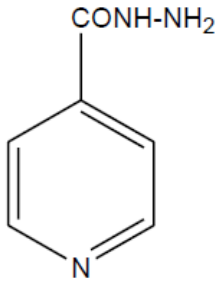
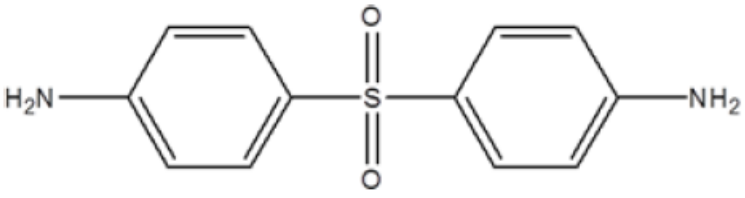
		Classification: A. Nonselective COX inhibitors (conventional NSAIDs) • Salicylates: Aspirin, Diflunisal • Para Amino Phenol Derivatives- Phenacetin, Paracetamol (Acetaminophen) • Pyrazolone derivatives: Phenylbutazone, Oxyphenbutazone • Indole derivatives: Indomethacin, Sulindac • Propionic acid derivatives: Ibuprofen, Naproxen, Ketoprofen, Flurbiprofen • Anthranilic acid derivatives: Mephenamic acid • Aryl-acetic acid derivatives: Diclofenac. • Oxicam derivatives: Piroxicam • Pyrrolo-pyrrole derivative: Ketorolac B. Preferential COX-2 inhibitors: Nimesulide, Meloxicam, Nabumetone C. Selective COX-2 inhibitors: Celecoxib, Rofecoxib, Valdecoxib	3 Marks classification
c)		**Write any one important use of Indigo carmine, Evans blue, Fluorescein Sodium and Congo red.** **Uses of Indigo carmine** ➢ It is administered intravenously to test renal function (by estimating the rate of excretion in urine) & to locate the uretheral orifices. ➢ In the lab it is used as coloring agents. **Uses of Evans 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.	1 Mark each

	d)	**Uses of Fluorescein Sodium** ➢ Diagnostic agent for detecting lesion and foreign body in ophthalmic practice. **Uses of Congo red** ➢ 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.) ➢ Also used as an indicator in lab. **Draw structure and give the uses of** **i. Isoniazid**  **Uses of Isoniazid:** • Treatment of Tuberculosis • Treatment of meningitis, genitourinary infection **ii. Dapsone**  	1 Mark Str. 1 Mark Uses each

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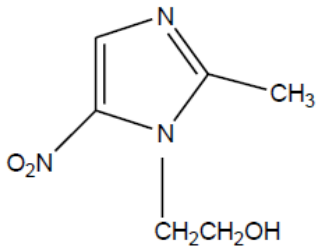
	e)	**Uses of Dapsone** • Dapsone is the principal drug used in the treatment of all forms of leprosy. • Dapsone is used in combination with pyrimethamine in the treatment of malaria. • In addition to its use in leprosy, dapsone has been found of value in dermatitis. **Give the structure, chemical name, dosage forms and brand names of Metronidazole.** **Structure:-**  **Chemical name : 2-(2'-Methyl-5'-nitroimidazolyl)ethanol OR** **1-(2'-hydroxyethyl)-2- methyl- 5-nitro imidazole.** **Dosage forms: -** ✓ Metronidazole tablet ✓ Metronidazole gel ✓ Metronidazole infusion ✓ Metronidazole syrup ✓ Metronidazole suspension **Metronidazole brand name:** Aristogyl, Flagyl, Metrogyl, Aldezol, Unimezol **.**	1mark each

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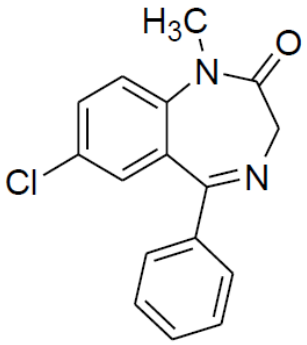
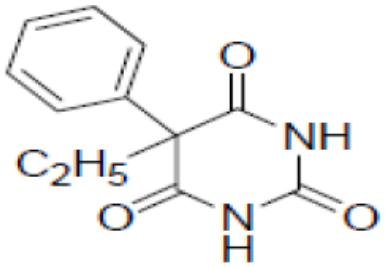
4.		**Attempt the THREE of the following:**	3x4=12marks
	a)	**What are tranquilizers? Draw structure and write the chemical name and brand names of Diazepam.** **Tranquilizers: -** Tranquillizers are CNS depressants which bring about a calming effect and induce a mild sedative effect. These are the agents or drugs which reduce anxiety, induce mental repose, and suppress agitation without significantly diminishing mental alacrity, they may cause some drowsiness but tolerance soon develops to this effect. **Structure of Diazepam:-**  **Chemical Name:- 7-Chloro-1, 3-dihydro-1-methyl-5-phenyl-2H-1,4-benzodiazepin 2-one.** **Diazepam Brand Names: -** Calmpose, Valium, Placidox, Anaxol, Quietal, Diazewok, Zepose, Microdep.	1 Mark each
	b)	**What is epilepsy? Classify anticonvulsants and write the structure of Phenobarbitone.** Epilepsy is a disease which arises due to the disorders of control nervous system. This disease is characterized by somewhat more or less frequent recurrence of seizures in	1 Mark meaning

		which there occur convulsions or other abnormal body movements, which are accompanied by loss or disturbance in consciousness. Anticonvulsants are classified as: 1) Barbiturates: - Barbitone sodium, Phenobarbitone, Methyl phenobarbitone. 2) Hydantoins :- Phenytoin, Mephenytoin 3) Oxazolidinediones :-Trimethadione, Paramethadione 4) Succinimides :- Ethosuximide, Phensuximide 5) Benzodiazepines: Diazepam, Clonazepam, Lorazepam, Nitrazepam 6) Miscellaneous :- Primidone, Carbamazepine, Valproic acid, Phenacemide, Pregabalin, Gabapentin **Phenobarbitone Structure**  	2 Marks Classification 1Mark str.
	c)	**Define and classify narcotic analgesic drugs.** Narcotic analgesics are derivatives of opium, semi synthetic or synthetic agents having potent analgesic & narcotic activity and effective for the treatment of severe pain. Classification of Narcotic analgesics Narcotic analgesic are classified as:- 1. Morphine and related compounds (Natural alkaloids of opium) e.g. Morphine, Codeine. 2. Semi-synthetic derivatives of morphine- Heroin, Brown Sugar 3. Synthetic Agents- Methadone, Pethidine, Dextropropoxyphen hydrochloride	1 Mark definition 3 Marks classify.

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	d)	**What do you know about sex hormones? Give the uses of Progesterone and Cortisone.** 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. Three main types of sex hormones are **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. **Oestrogens :-** Oestrogens influence development and maintenance of secondary female sex characters. They are also essential for maintenance of pregnancy. They also exert anabolic effect on protein metabolism & water retention. **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 Progesterone:** ➢ It is used as a hormonal replacement therapy in deficiency of progesterone. ➢ It is used in treatment of dysfunctional uterine bleeding. ➢ It is also used along with estrogen in menstrual disorders, premenstrual tension ➢ It is used in treatment of neoplasm of breast and endometriosis. ➢ It has also been incorporated into an intra-uterine device for female contraception. ➢ Treatment of habitual abortion. ➢ Maintenance of pregnancy if it occurs. **Uses of Cortisone:** ➢ Anti-inflammatory action: Cortisone is a steroid that prevents the release of substances in the body that cause inflammation. ➢ Cortisone is used to treat many different conditions such as allergic disorders, skin conditions, ulcerative colitis, arthritis, lupus, psoriasis, or breathing disorders.	1 Mark sex hormones, 1.5 Marks to uses of each drug

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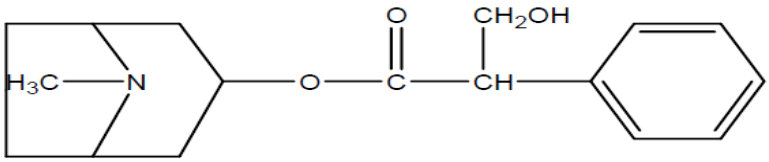
- Treatment of rheumatoid arthritis and osteoarthritis
- Treatment of lung infection
- Treatment of allergic conjunctivitis
- It has immune suppressant action hence used in organ transplantation and autoimmune disorder.
- Treatment of Addison's disease.

e) **Write the structure and uses of**

i. Atropine — 1Mark Str.



1Mark use.

Atropine Uses:

- Atropine has antispasmodic action on smooth muscles, hence used for the treatment of gastric and duodenal ulcers and for the relief of renal and biliary colics.
- Useful in symptomatic treatment of Parkinsonism.
- It is one of the components of pre-anaesthetic medication, where it is given to reduce salivary and bronchial secretions and to diminish the risk of vagal inhibition of the heart.
- It is used by ophthalmologist for its mydriatic effects.
- Treatment of hyperhidrosis (Abnormal increased sweating)

ii. Propranolol

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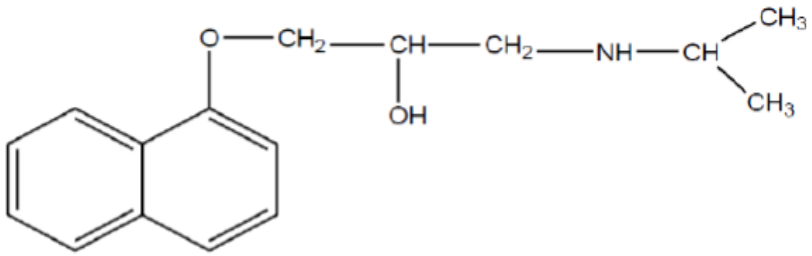
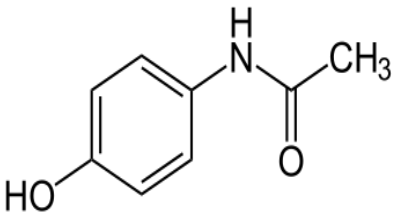
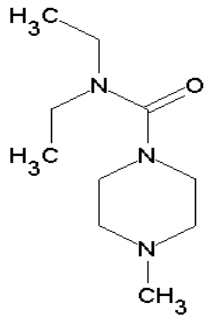
			1Mark Str.
		Propranolol Uses: ➢ Treatment of various cardiac diseases like Cardiac arrhythmia, Arterial hypertension, ➢ Angina pectoris, congestive heart failure, coronary atherosclerosis, tacycardia ➢ Treatment of Pheochromocytoma (cancer of adrenal glands) ➢ Treatment of glaucoma	1Mark uses
5.		**Attempt any <u>THREE</u> of the following.**	4x3= 12M
	a)	**Write structure, chemical name uses and brand names of Paracetamol** **Structure**  **Chemical name:** p-hydroxy acetanilide **OR** 4-hydroxy acetanilide **OR** 4-Acetylaminophenol **Uses:** **1.** Antipyretic **2.** Analgesics for relief of pain such as headache, toothache, neuralgia, rheumatism. **Brand names-** Tylenol, Calpol, panadol, crocin, metacin, valadol, paldesic, Dolo	1 Mark each
	b)	**Define antiseptics and disinfectants. Classify them with examples** **Def:** Antiseptic and disinfectants are the chemical agents which are employed to destroy	1 M definition

		or inhibit the growth of pathogenic microorganism. Antiseptics are applied on living tissues while disinfectants are used on inanimates or non living objects. **CLASSIFICATION** **1) Alcohols & Aldehydes** E.g. Ethyl Alcohol, Isopropyl 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. , Thiomersal, Mercuric chloride **5) Dyes.** E.g. Proflavine Hemisulphate, Acriflavine, Brilliant Green, Crystal Violet (Gentian Violet), Methylene Blue. **6) Surface Active Agents** E.g. Benzalkonium Chloride, Cetrimide, Cetylpyridinium Chloride, Domiphen Bromide, **7) Miscellaneous Agents.** E.g. Dequalinum Sulphate, Nitrofurazone.	3 M classification
c)		**Give structure, chemical name and uses of D.E.C.** **Structure**  	2 M structure 1 M chemical name 1M uses

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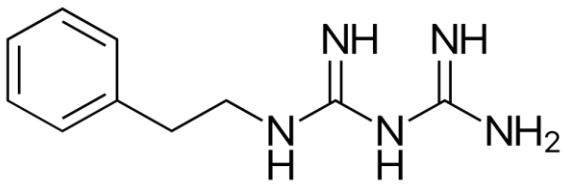
		Chemical Name: N, N-diethyl-4-methylpiperazine-1-carboxamide **Uses:** 1. Anthelmintic: treatment of hookworm, tapeworm, roundworm, pinworm, whipworm infection. 2. Used to treat filariasis particularly when due to W. bancrofti, or Loa loa.	
	d)	**Classify hypoglycemic agents. Give the structure of phenformin.** **Classification** **1. Insulin** A) Short acting- Neutral Insulin B) Intermediate acting- Isophane (NPH) Insulin, Lente Insulin C) Longer acting- Ultralente Insulin **2. Oral hypoglycemic** A) Sulphonylureas- Tolbutamide, Chlorpropamide, Glipizide, Glibenclamide B) Biguanides- Phenformin, Metformin C) Thiazolidinediones (TZDs)- Rosiglitazone, Pioglitazone D) Alpha glucosidase inhibitors- Acarbose, Miglitol, Voglibose	3 M classification
		Phenformin  	1 M structure
	e)	**Write structure, chemical name, dosage forms and brand names of Chloroquine** **Structure of Chloroquine**	1 M each

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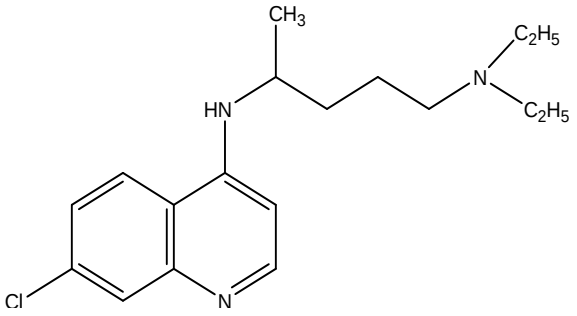

Chemical name: 7-Chloro-4-[4'-(diethylamino)-1-methyl butyl] amino quinoline

Dosage forms:

1. Chlroquine Phosphate Injection
2. Chlroquine Phosphate Tablets
3. Chlroquine Syrup
4. Chroquine Sulphate Injection
5. Chroquine Sulphate tablet

Brand Names: Cadiquin, Cloquin, Emquin, Lariago, Aralen, Avioclor, Quinross, Resochin, Nivaquine

6. **Attempt any <u>THREE</u> of the following:** 4x3=12 marks

a) **What are anti-amoebic agents? Classify them with suitable examples.**

Anti-amoebic agents: The drugs which are used in the treatment of amoebic infection caused by Entamoeba histolytica are called as antiamoebic drugs. 1 M definition

Classification of antiamoebic drugs: 3 M classification

1. **Drugs of natural origin:** e.g. emetin
2. **Synthetic drugs:**
   a. Quinoline derivative e.g. Chloroquine
   b. Halogenated-8-hydroxyquinoline derivative e.g. quinidochlor, Diiodohydroxyquinoline
   c. Nitro-imidazole derivative e.g. Metronidazole, Tinidazole

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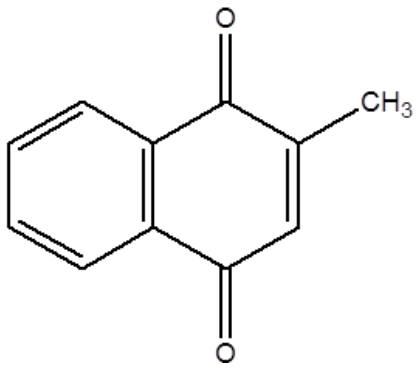
		d. Antibiotic: e.g. Paramomycin, Tetracycline, chlortetracycline, oxythromycin e. Organic arsenicals: e.g. carbarsone f. Miscellaneous e.g Diloxanide furoate	
	b)	**Explain the process of blood coagulation. Write the structure and chemical name of menadione.**	
		Process of blood coagulation: ➢ Thrombin and several clotting factors present in plasma and calcium ions are involved in the coagulation. Process of blood coagulation can be described as follows. ➢ Whenever there is an injury to a blood vessel, there is formation of rough surface. When blood platelets come in contact with such a rough surface, they are injured. ➢ Due to injury, they release the substance called thromboplastin. In the presence of thromboplastin and calcium in the blood plasma prothrombin is converted into thrombin which helps in conversion of fibrinogen to fibrin. ➢ The fibrin is insoluble and forms threads. The threads of fibrin form a net. In the holes of this net, blood cells are entangled. This mass then contracts to form a blood clot.	2 M process
		Structure  **Chemical Name:** 2-Methyl-1,4-naphthoquinone	1 M structure 1M chemical name

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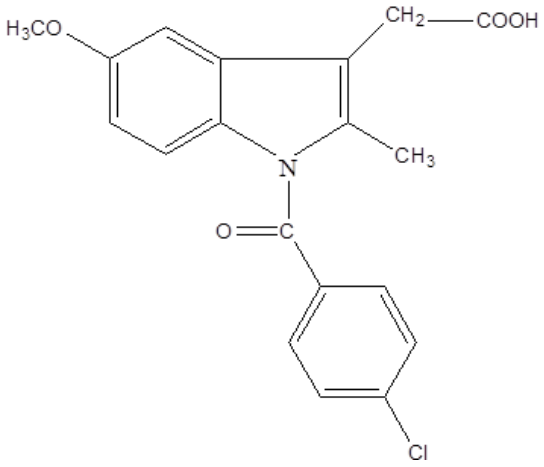
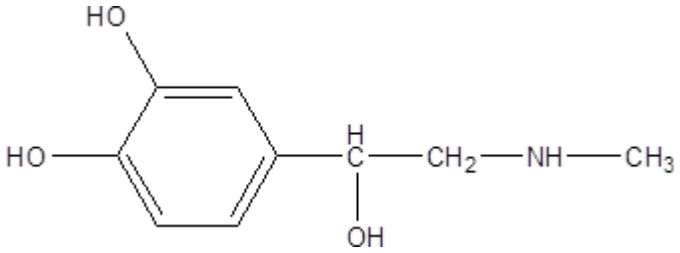
	c)	**Give the structure and uses of** **i) Indomethacin ii) Adrenaline** **i) Indomethacine**  **Uses:** 1. Anti-inflammatory and analgesic in rheumatoid arthritis 2. Treatment of spondylitis, osteoarthritis and in gout 3. Treatment of dysmenorrhea and migraine. **ii) Adrenaline**  	1mark each

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		Uses: 1. To relieve bronchial spasm in acute attacks of asthma. 2. It is used to increase blood pressure in treatment of hypotension. 3. Intra venous administration of Adrenaline is used to treat acute circulary collapse or cardiac arrest. 4. Treatment of allergic disorder. 5. Treatment of superficial bleeding due to its vasoconstriction effect. 6. Added to local anesthetic to prolong the duration of effect. **7.** It has mydriatic effect.	
	d)	**Define and classify cholinergic drugs. Write the uses of Acetylcholine** **Definition:** The agents that mimic the action of acetylcholine or produce the effect of parasympathetic nerve stimulation are called as cholinergic drugs or parasympathomimetic agents. **Classification:** 1**.** Choline esters: Acetylcholine, Methacholine, Carbachol 2. Cholinomimetic alkaloids: Muscarine, Pilocarpine, Arecholine 3. Cholinesterase inhibitors (Indirectly acting) A) Reversible Inhibitors- Physostigmine, Neostigmine, Pyridostigmine B) Irreversible Inhibitors- Organophosphates (Parathion, Malathion), Insecticides. **Uses of Acetylcholine**: 1. It reduces intraocular pressure in glaucoma 2. In the relief of atony of gut and urinary bladder	1M definition 2M classification 1M uses

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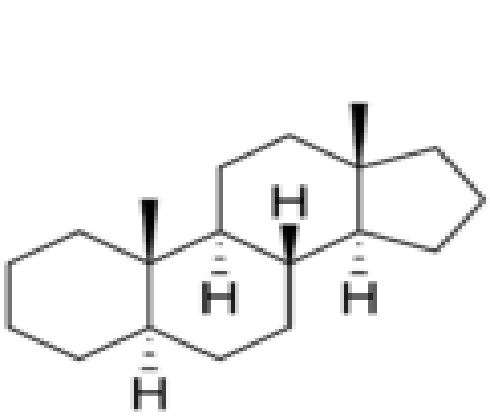
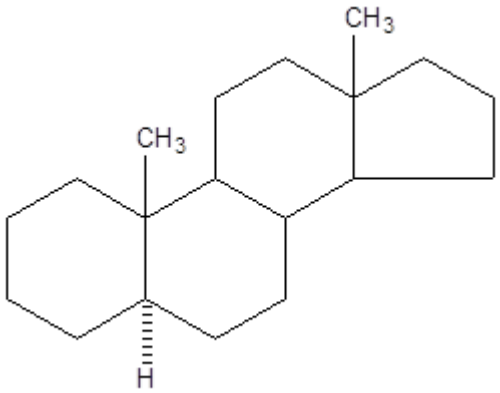
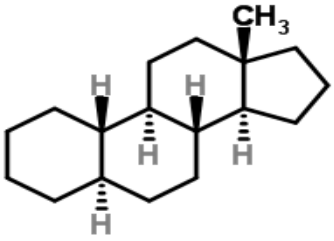
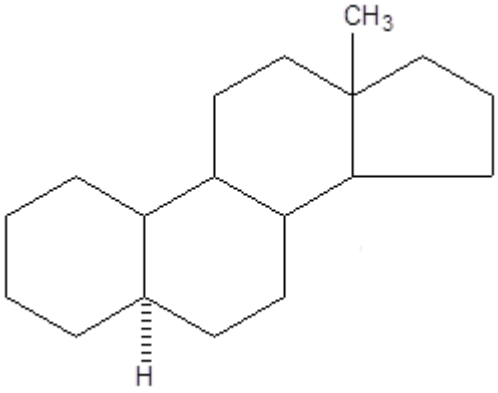
	e)	**What are steroidal drugs? Draw the structure of 5-α- androstane, 5-α-estrane and 5-α- pregnane**. Steroids are polycyclic organic compounds containing 1,2-cyclopentanoperhydrophenanhrene skeleton. i.e. it contains four fused rings A, B, C, D and thus are polycyclic hydrocarbons. The ring A, B and C are six membered and ring D is five membered.   **OR** **5- α Androstane**   **OR** **5 α- Estrane**	1 mark each

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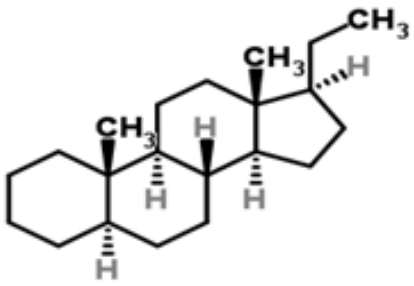

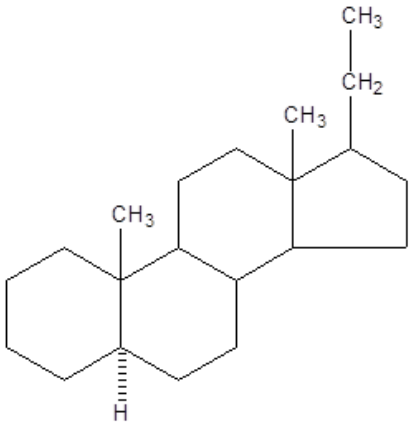

OR

5 α- Pregnane