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.

1. Define the following terms and give two suitable examples of each(1+1 marks)
(ANY FIVE)

(a) Anticonvulsants: Are the agents used in the treatment of convulsions.
Examples: Phenytoin, methoin, primidone, diazepam, ethosuximide etc.

(b) Narcotics: Narcotics are the drugs which possess the ability of depressing central nervous system.
Examples: Morphine, codeine, heroine, pethidine, methadone etc.

(c) Antidotes: Are the agents which counteracts the effect of poison.
Examples: BAL, EDTA.

(d) Plasma Expanders: These are the high molecular weight substances which exert colloidal osmotic pressure and when infused i.v. retain fluid in the vascular compartment.
Examples: Dextran, gelatin,PVP , Physiological saline ,Gum saline.

(e) Antineoplastics: Are the agents used in treatment of neoplasm or cancer
Examples: Methotrexate. Cyclophosphamide, Chlorouracil, busulfan etc

(f)Oral contraceptives: Are the orally administered agents used for reversible suppression of fertility or agents used for preventing conception.
Examples: Estrogen, progesterone. (Anovlar 21, Primovlar 30, Ovlar, Lyndiol 1)

(g)Parasympatholytics: These are the drugs which block the cholinergic receptors in the effector organs supplied by cholinergic nerves.
Examples: Atropine, Hyoscine.

2. Attempt any FOUR of the following:

(a) What are diuretics?(1.5 marks) Can drinking water be used as diuretic? Explain (2Marks)

Defination: These are the drugs which increases the rate and volume of urine formation.

E.g: Electrolytes , mannitol, spironolactone etc.

Indications: Diuretics are indicated or used in the treatment of hypertension, edema, drug poisoning like barbiturate poisoning to excrete out the absorbed drug.

Water as a diuretic: Yes, when water is consumed in **excess** it acts as diuretic.

Water when taken in excess it inhibits anti diuretic hormone and increases the permeability of nephron to water. This results into decreased reabsorption of water thus volume of urine to be excreted increases that will lead to diuresis.

(b) Mention different stages of General Anaesthesia.(1 mark)

Explain properties of an ideal General Anaesthetic.(2.5 mark)

Different stages of General Anaesthesia:

Stage 1: Stage of Analgesia

Stage 2: Stage of Delirium

Stage 3: Stage of Surgical Anesthesia.

Stage 4: Stage of Respiratory Paralysis.

Properties of an ideal General Anaesthetic:

For the patients: It should be pleasant, **non irritant**, should not cause nausea or **vomiting** which if occur may disturb the stitches.

Induction and recovery should be **fast** with no unpleasant after effects.

For the surgeon: It should provide **adequate analgesia** i.e. loss of pain Sensation, immobility and **muscle relaxation** so that surgeon can Perform surgery with ease.

For the anaesthetist: Its **administration** should be **easy**. It should have wide **margin of safety**. It should be **potent** so that oxygenation of patient does not suffer.

(c) What is Helminthiasis? Why Piperazine is supplemented with purgatives? (1+2.5)

Helminthiasis is the disease caused by the infestation by the worms.Piperazine reversibly inhibits neuromuscular transmission in the worm That will paralyse the worm. The paralysed worm should be expelled out from intestine. Purgatives are the agents which evacuates the bowel, hence purgatives are advised as supportive treatment with anthelmintics.

(d) Distinguish between Drug Addiction and Drug habituation.(3.5 marks)

	Drug Addiction	Drug Habituation
1	**Drug Addiction:** is a state of periodic or chronic intoxication produced by repeated consumption of a drug.	**Drug Habituation:** is a condition resulting from repeated administration of a drug.
2	There will be overpowering desire to continue taking the drug and obtain it by any means.	There will be desire but not compulsion to continue taking the drug for the sense of well-being.
3	There is a tendency to increase the dose.	Little or no tendency to increase the dose.
4	A psychological and generally a physical dependence on the effect of the drug.	Some degree of psychic dependence on the effect of the drug, but absence of physical dependence and hence of an abstinence syndrome.
5	The effect is detrimental to the individual and to the society.	If any detrimental effect it is on the individual.

(e) What are β-blockers? (1 mark)

Give their classification with examples.(2.5 marks)

These drugs inhibit adrenergic responses mediated through the β-receptors.

They are competitive antagonists.

Therapeutic uses: They are used in the treatment of angina pectoris, cardiac arrhythmias, hypertension, migraine etc.

CLASSIFICATION:

(1)Specific β-blockers- Sotalol, Timolol

(2)β-blockers with membrane stabilizing activity and intrinsic sympathomimetic activity- Dichloroisoprenalin

(3)β-blockers with membrane stabilizing activity - Propranalol

(4)β-blockers with additional α-blocking activity- Labetalol.

(f)**Why are toxicity studies carried out on all medicine? (3.5 marks)**

Toxic effects of the drug are seen in exaggeration of pharmacological actions of the particular drug.
Toxicology is branch of science deals with the study of poisonous effect of drugs on living organisms. It gives emphasis on detection, prevention and treatment of poisoning. Organic damage often occurs when toxicity is produced. Prolonged use of streptomycin, may produce vertigo and deafness due to damage of the auditory nerve branches.
Every drug can act as healing medicine or a poison, the effect principally depends on the dose of that particular drug.
For example morphine in therapeutic dose produces analgesia this is desirable effect of morphine while respiratory depression seen after a large dose of morphine is its toxic effect.

A number of incidents in different parts of the world such as series of deaths associated with the use of sulfonamides in U.S.A. in 1938, thalidomide disaster in Europe during 1957-1960, made Gov, authorities to bring some check on the introduction of new drugs **for safety of the patients**. FDA administration of different countries regulates the introduction of newer drugs.

It is impossible to certify a drug to be absolutely safe, **Therapeutic Index** will give an idea of margin of safety of particular drug. It is possible to **identify** most of **the hazards** likely to be associated with use of the drug. Thus to find out potential hazards of the drug, toxicity tests are carried out in animals before a drug is administered to human beings.

Q.3Attempt any seven of following:

a) Drug of choice: (0.5 each)

i) Leukemia: 6 mercaptopurine / Chlorambucil / Busulphan

ii) Leprosy: Dapsone (4-4 diamino diphenyl sulphone DDS)

iii) Trichomoniasis: Metronidazole

iv) Rheumatoid arthritis: Ibuprofen / Indomethacin / Paracetamol

b) Adverse effect: (0.5 each)

i)Propranolol: Postural Hypotension

ii)Penicillin: Anaphylactic shock

iii) Phenobarbitone: Sedation/ hypnosis/ dizziness,/ respiratory depression

Chyne strokes breathing/ nystagmus/ hangover

iv) Pheniramine maleate: Drowsiness/ bradycardia

c) Therapeutic use: (0.5 each)

i)Chlorsoxazone: As Muscle relaxant

ii) Chlorpromazine: In treatment of Schizophrenia (Antipsychotic)

iii) Chlorpropamide: As Oral hypoglycemic

iv) Clotrimazole: As antifungal (vaginal yeast infections)

d) Dose: (0.5 each)

i)Mebendazole: 100 mg twice daily for 3 consecutive days (oral)

ii) Trinitroglycerine: 0.3- 0.6 mg every 8-12 hrs.(sublingual)

iii) Streptomycin: 0.75-1 gm daily (I.M.) / 0.5—2gm daily in divided doses (Oral)

iv) Levodopa: 2.5- 8gm daily in divided dose / 125 mg b.i.d. as initial dose

e) Route of administration: (0.5 each)

i)Griseofulvin: Oral

ii) Nalorphin: I.V. / I.M/ parenteral.

iii) Heparin: I.V/ parenteral.

iv) Thiopentone Sodium: I.V./ parenteral.

f) Drugs that produce following effect: (0.5 each)

i)Insomnia: Analeptics / CNS Stimulants / Caffeine / MAO Inhibitors

ii) Anorexia: Amphetamine

iii) Hypoglycemia: Insulin / oral hypoglycemic agents / Alcohol

iv) Emesis: Morphine / Apomorphine / Ipecacunha / Sodium chloride

g) Antidote: (0.5 each)

i)Arsenic Poisoning: BAL / Dimercaprol

ii) Acute Belladona Poisoning: Physostigmin

iii) Organophosphorous compound poisoning: Atropine Sulphate / Pralidoxime

iv) Mercury Poisoning: BAL / Egg albumin

h) Drug contraindicated in conditions: (0.5 each)

i)Renal failure: NSAIDS like Ibuprofen/ Aspirin / Digoxin / Antacids / Laxatives-Milk of Magnesia / Decongestants like Pseudoephedrine / Contrast dye used in CT Or MRI / Sulpha drugs / Salt substitutes containing potassium

ii) Cirrhosis of liver: Phenbarbitone sodium / Alcohol

iii) Congestive Cardiac Failure: Quinidine

iv) Intestinal obstruction: Atropine / Morphine

(i) One drug as : (0 .5 each)

i)Disinfectant: Phenol/ Cresol/ Hydrogen peroxide

ii) Carminative: cardamom/ ginger / fennel / asafetida / cinnamon / clove / coriander

iii) Hypnotic: Barbiturates, Benzodiazepins / chloral hydrate / Paraldehyde

iv) Broad Spectrum antibiotic: Tetracyclines / Chloramphenicol,/ Amoxicillin / Levofloxacin

Q.4 Attempt Any Four

a. Various routes of administering drugs (1.5 Marks)

Enteral	**Parenteral**	**Local Applications**
Oral	Injections	Inhalations
Sublingual	Intradermal	
Enema	Subcutaneous	
1) Retention	Intramuscular	
2)Evacuent	IV, IA	
	Intraperitoneal	
	Intrathecal	
	Intramedullary	
	Intraarticular	

Advantages of Inhalations:(1 mark)

1.gaseous and volatile agents and aerosols (adrenaline spray for bronchial asthma) can be used

2.rapid onset of action due to rapid access to circulation

a. due to large surface area

b. as thin membrane separate alveoli from circulation

c. due to high blood flow

3. Anaesthetics can be given by this route.

Disadvantages of Inhalations:(1 mark)

1. Danger of cardiac toxicity as drug directly enters left side of heart.
2. Drugs producing local irritation may increase respiratory tract secretions.
3. Special skill & specially designed apparatus is required.(masks, automizers) So use is limited

b) Anti –psychotic (1.5 marks)

An **antipsychotic** (or **neuroleptic**) is a psychiatric medication primarily used to manage psychosis (including delusions, hallucinations, or disordered thought), particularly in schizophrenia .They can also be called as Major tranquilisers.

Examples: Phenothiazines, Meprobamate, Haloperidol.

Uses: Antipsychotics can be used in the treatment of psychomotor disorders likes schizophrenia, mania etc.

Mechanism of action of MAO Inhibitors(2 marks)

- These drugs block oxidative deamination of naturally occurring amines.
- MAO enzyme is present intracelluraly in most of the tissues(highest conc. in liver)
- Enzyme oxidises active biogenic amines like 5HT, noradrenaline, & dopamine to inactive compounds.
- These amines are normally stored in granules in the neurons & get liberated by nervous stimuli.
- MAO inhibitors inhibit the enzyme & result in accumulation of these amines in the brain
- Ultimately excitement, enhanced motor activity is observed.
- So MAO inhibitors are used as antidepressants or psychoanaleptics.

c) Ephedrine preferred to atropine : (3.5 marks)

- Ephedrine interacts with alpha adrenergic receptors in the eye & produce mydriasis without causing cycloplegia & photophobia.
- Cycloplegia is paralysis of accommodation with fixing of lens for far vision.
- Atropine produces mydriasis by causing paralysis of sphincter muscles of iris & also causes paralysis of ciliary smooth muscles & tightening of suspensory ligaments, resulting in cycloplegia & photophobia which lasts for 1-10 days.
- To avoid such visual complications, ephedrine is preferred to atropine to produce mydriasis in elderly patients.

d) Tuberculosis: (1mark)

Tuberculosis is an infectious disease caused by several species of Mycobacteria. It's a systemic disease & the commonest form is chronic pulmonary tuberculosis.

Symptoms include chest pain and a productive, prolonged cough.

- In the other 25% of active cases, the infection moves from the lungs, causing other kinds of TB, collectively denoted as extra pulmonary tuberculosis.
- This occurs more commonly in immunosuppressed persons and young children.

Chemotherapy:(2.5 mark)

Agents used for treatment are of 2 types:

➢ Standard drugs used in initial treatment/1st line drugs:

- Streptomycin
- Isonicotinic acid hydrazide
- Rifampicin

Para amino salicylic acid(PAS)

- Reserve drugs used in resistant cases/2nd line drugs:

- Pyrazinamide
- Kanamycin
- Viomycin

Frequently used combinations are (2 drug & 3 drug regimen):

- Rifampicin + INH
- Ethambutol + INH
- Rifampicin + INH + Pyrazinamide
- Rifampicin + INH + Pyrazinamide + Ethambutol
- Short course chemotherapy includes

  Rifampicin + INH + Pyrazinamide for 2 months & then Rifampicin + INH for next 4 months.

  Ethambutol or Streptomycin may also be added.

In tuberculosis treatment, **drug combination** is preferred than single dose treatment:

- Resistance to antitubercular drug is developed rapidly if used single than combination treatment.
- Combination therapy avoids the viability & multiplication of bacilli during treatment.
- Combined drug therapy gives synergistic effect.
- It avoids cessation which tends to block the blood vessels supplying to necrotic area and making penetration by antitubercular drug difficult.

e) Anaemia:(1 mark)

- Decrease in oxygen carrying capacity of blood
- It depends on haemoglobin content of erythrocytes
- Erythropoiesis is the process of erythrocyte formation in red bone marrow
- Deficiency of various dietary factors like iron , folic acid, vitamin B12 disturb normal erythropoiesis

Reduction in blood haemoglobin level & number of circulating erythrocytes indicate anaemia

Classes & treatment (2.5marks)

- Microcytic, hypochromic anaemia:

Size of RBCs is smaller & Hb is less than normal (Iron can be administered)

Microcytic Anaemia

Microcytic anemia is primarily a result of hemoglobin synthesis failure/insufficiency, which could be caused by several etiologies

- Macrocytic anaemia (Vit B12 , Folic acid can be administered)

RBCs larger than normal

Megaloblastic anemia, the most common cause of macrocytic anemia, is due to a deficiency of either vitamin B_{12}, folic acid, or both

- Normocytic anemia occurs when the overall hemoglobin levels are decreased, but the red blood cell size remains normal. Causes include:

Acute blood loss,Anemia of chronic disease,Aplastic anemia (bone marrow failure)Hemolytic anemia

- Sickle cell anaemia :

  Cells are sickle shaped. Persons should avoid higher altitudes for lack of oxygen.

F) Drug Interactions: (1.5 marks)

- Drug interactions are result of the use of two or more drugs
- They may occur either outside the body or within the body.
- They may be useful or harmful to our body.

Drug interactions are mainly observed due to:

- Multiple drug therapy
- Drugs having more than one action or Availability of many potent drugs

Beneficial Drug Interactions:(2 marks)

Drug interaction may prove beneficial when it allows reduction in dose by enhanced efficacy without increased toxicity.

Examples:

- Important therapeutic effect

  Administration of Dimercaprol in treatment of arsenic poisoning.

- More appropriate onset or duration of action

  Probenecid prolongs the activity of penicillin as antibacterial agent

- Lowered toxicity.
- Additive effect or Synergism.

  Trimethoprim & sulphamethoxazole show synergistic action

- Enhanced potency
- Greater margin of safety

Q5. Attempt any Four of the following. : (3.5 marks each)

a) Explain how drug tolerance modify drug action.

Drug Tolerance- On repeated administration of some drugs, they may prove ineffective in usual therapeutic dose.

Types of tolerance:-

i) Natural or Congential:-It is by birth.

1) Species tolerance:- eg. Belladona alkaloids like atropine is toxic to human beings when given in high dose but rabbits can tolerate high amount of atropine because they have an enzyme known as atropine esterase which metabolizes high amount of atropine very rapidly. Hence no toxicity is seen.

2) Racial Tolerance:- eg. After administration of drug Ephedrine, Mydriasis is not produced in Negros because they are tolerant to the drug ephedrine and related amines.

ii) Acquired tolerance:- Repeated administration of some drugs leads to acquired tolerance.

1) Tissue Tolerance: In case of tissue tolerance, tolerance is developed to certain effects of the drugs. e.g Morphine is able to produce its euphoria effect but the pupil & gastrointestinal tract effects never develop tolerance.

2) Cross tolerance: This tolerance is developed to a drug belonging to particular group, then there could be tolerance to all other drugs in the same group. Eg. when tolerance is developed to alcohol, patient may develop tolerance for use of general anesthetic and other CNS depressants. Tolerance to vasodilation effect of glyceryl trinitrate in individual shows tolerance to pentaerythritol trinitrate from same group.

3) Pseudo tolerance: Observed only in oral route. When small dose of poison is taken repeatedly, tolerance to it is developed by the gastrointestinal tract. But if other route is chosen, poisoning will occur.

4) Tachyphylaxis: It is also known as acute tolerance, observed with certain drugs such as Ephedrine when administered repeatedly at very short intervals & the pharmacological response to that drug decreases.

b) Write a note on 'Autocoids,(1.5 mark) and explain "Triple response of Histamine". (2 marks)

The word Autocoid comes from the Greek: **auto**: meaning self and **akos**: means remedy.

Autocoids are local hormones with high biological activity and naturally found in body as active or inactive forms.

The important autocoids found in the body are histamine, serotonin, 5 hydroxytryptamine, bradykinin, angiotensin and prostaglandins.

Histamine is a potent biogenic amine stored in mast cells inactive form. Histamine release in the body vary from simple skin rash upto anaphylactic shock.

Triple response – Intradermal injection of histamine shows three responses as follows-

i) Reddening at the site of injection described as 'flush'

ii) It is followed by bright flare beyond flush, and

iii) Development of localized edema i.e. wheal

c)**What are local anaesthetics?(1.5 marks) Explain various methods of producing local anaesthesia.(2 marks)**

Defination: Local anaesthetics are pharmacological agents which when applied or injected, block the conduction as well as generation of impulses in localized area and bring loss of sensation without affecting degree of consciousness. OR

They are the compounds that when applied in appropriate concentration, block nerve conduction in the area of application.

Examples: cocaine, xylocaine, benzocaine etc.

Ideal L.A. should have following characteristics:

1) It should both lipid and water soluble
2) It should have vasoconstriction property.
3) It should not cause any permanent damage to the nerves.

Methods of producing local anaesthesia-

(I) By paralyzing of nerve endings:

i) Application to mucus surface, skin, wounds (surface anaesthesia): In this case the LA is just applied on the skin or mucus membrane.

ii) By hypodermic injection: LA is injected under the skin layer.

iii) By infiltration: Here LA is injected first intradermally, then subcutaneously and then into deeper tissues.

(II) By blocking the sensory impulse:

i) Block anaesthesia: Here the LA is injected close to nerve trunk

ii) By spinal anaesthesia: The LA is introduced after lumbar puncture

iii) By caudal anaesthesia: The LA is injected into epidural space.

(d)Explain Dale's Vasomotor Reversal.(3.5 marks)

In low doses, Adrenaline causes peripheral vasoconstriction, increase in resistance, output, and thereby rise in peripheral and systolic BP.

In high doses, Adr activates both alpha and beta receptors. It causes peripheral vasoconstriction and leads to rise in systolic BP. This is followed by skeletal muscle dilation of blood vessels, decrease in resistance and output, fall in diastolic BP. This response of Adr is known as biphasic response.

Its vasoconstriction action is blocked by alpha blocker like ergotoxin, Adr causes only fall in BP. This reversal action of Adr is called as Dale's vasomotor reversal.

Diagram

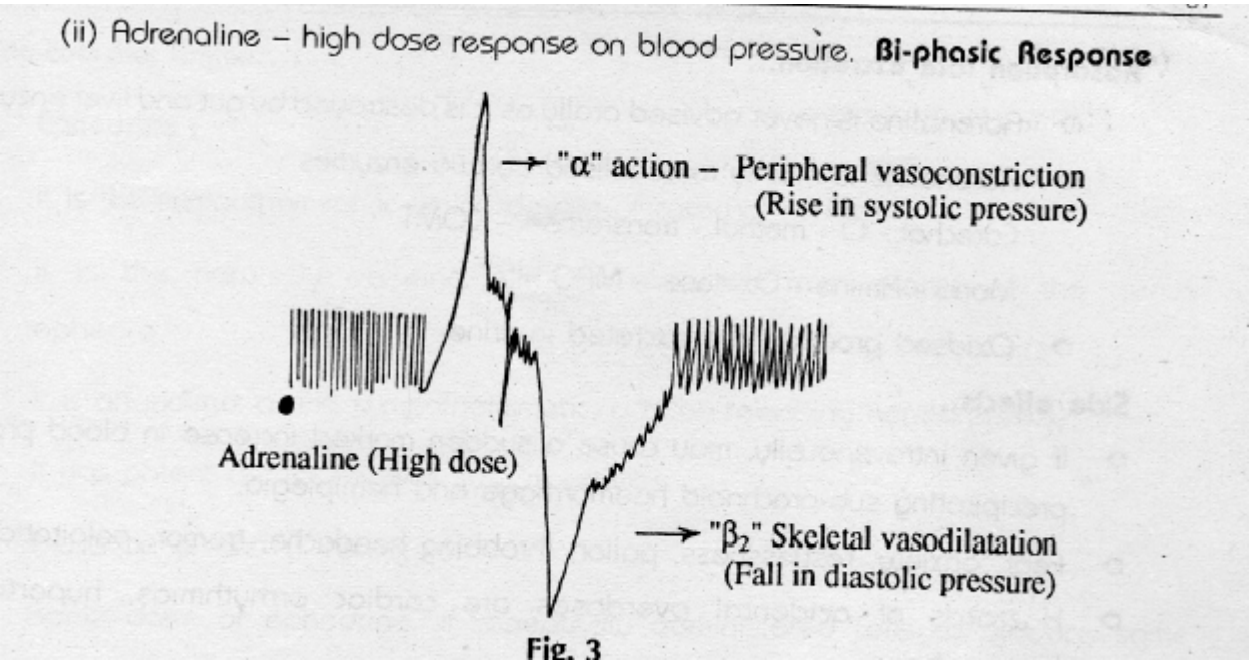
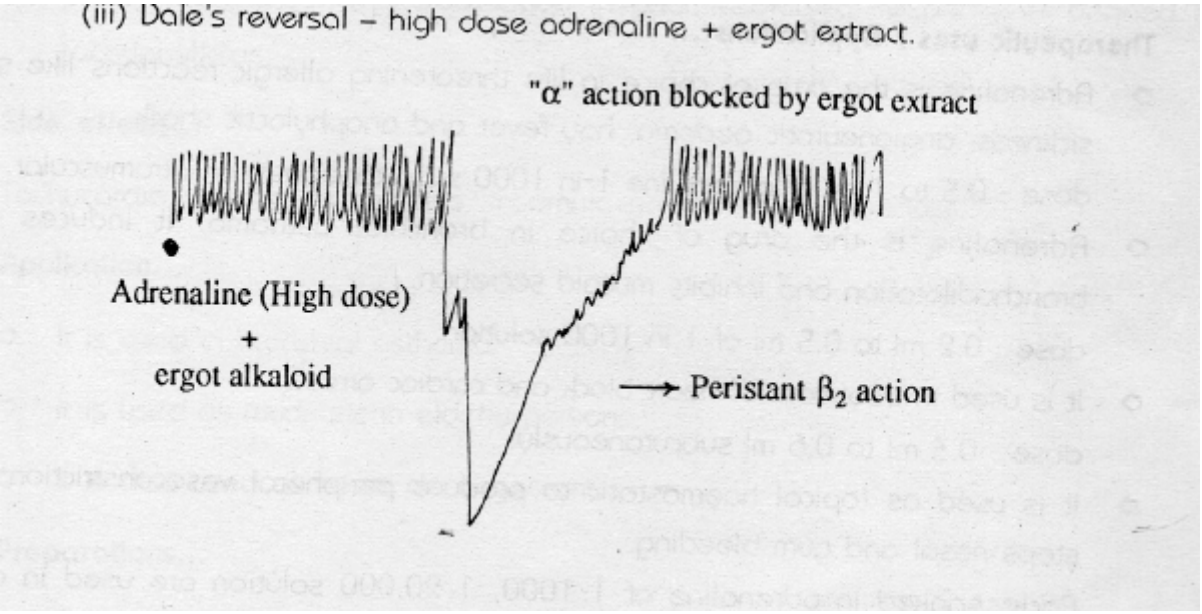


Fig. 3



(e)Write a note on Oral Hypoglycemic compounds. (3.5 marks)

Oral hypoglycemics are the pharmacological agents when administered orally decrease blood glucose level. There are two classes of oral hypoglycemics:-

i) sulphonyl urea derivatives – Eg-tolbutamide, chlorpropamide

ii) biguanides – Eg- Phenformin, metformin.

Sulphonylureas stimulate the beta cells of islets of langerhans to secrete insulin. These agents are effective in patients who have residual insulin in their pancreatic beta cells. When administered, they are readily absorbed from g.i.t. Side effects include nausea, vomiting, weakness, epigastric discomfort.

Biguanides are effective in absence of functioning pancreatic beta cells or residual insulin. They inhibit glucose absorption from g.i.t. and hepatic gluconeogenesis. It also increases utilization of glucose by peripheral tissues.

They can be used in combination with sulphonyl ureas.

(f)What is bronchial asthma?(1 mark) Explain therapy for it.(2.5 marks)

Definition: It is a clinical syndrome characterized by paroxysmal dyspnoea and wheeze due to increased airway resistance in narrowed bronchi.

Types of asthma:

1) Episode form: The attacks are relieved rapidly and completely by bronchodilators.
2) Status asthmaticus: attack is severe, persistent and do not respond to bronchodilaror like Adr or aminophylline.
3) Chronic form: In this case there is persistent dyspnoea and wheeze. The attack occurs from time to time.

Therapy –

i) Elimination of trigger factors eg allergens.

ii) Avoiding respiratory irritants as tobacco, smoke , chemicals

iii) Psychological treatment

iv) Drug therapy eg- a) bronchodilators like salbutamol, adrenaline

b) bronchodilator, steroids and maintenance therapy for chronic persistent asthama

c) corticosteroids for status asthamaticus

v) Supportive therapy

Q6) **Give reasons for any Seven of the following (2 marks each)**

a) **Acetylcholine is not used clinically.**

Ach acts on all cholinergic sites throughout the body.

It has short duration of action because it is susceptible to hydrolysis by cholinesterase.

When given orally, it is rapidly hydrolysed in git.

On IV administration, it has no appreciable actions because considerable amount of Ach is destroyed by pseudocholinesterases in plasma and by true cholinesterase at the site of action. Thus Ach has very short duration of action

It does not cross blood brain barrier so, does not have any central effect.

Therefore Ach is not used clinically.

b) **Toxicity of digitalis is increased by chlorthiazide.**

Chlorthiazide is a diuretic.

Thiazides depress sodium transport in the cortical dilating segment of nephron just proximal to Na-K exchange.

Thiazides also increase potassium excretion to a considerable extent

In the treatment of congestive cardiac failure with digitalis, there is already excess potassium loss ie hypokalemia

Hence if chlorthiazides are administered in patients on digitalis therapy then these increase the toxicity of digitalis.

c) **Sulponamides are not much in use nowadays.**

Sulponamides show a number of side effects such as intolerance, fever, severe skin rashes, joint pain, bronchospasm, toxic hepatitis, toxic nephritis, acute haemolytic anemia. It causes renal irritation, crystalurea, haematuria and obstruction of urine flow.

Since better drugs are available with fewer side effects for the treatment of diseases, therefore Sulponamides are not much in use nowadays.

d) **Tincture of opium is used in diarrhoea.**

Tincture of opium contains morphine, morphine has spasmogenic action on smooth muscles of git.

It causes constriction of sphincters and decrease in the peristaltic movements of git.

This action of morphine results in stagnation of intestinal contents causing maximum absorption of water and drying of faecal matter.

It reduces sensitivity of intestinal walls to defaecation reflexes.

The above actions of morphine cause constipation

Morphine which possesses constipating action so it is used in diarrhoea.

e) **Reserpine is never prescribed for immediate quietening of maniac patient.**

Reserpine is an antipsychotic drug.

It causes depletion of serotonin and catecholamines from the brain and peripheral sites which results in tranquilizing action.

Reserpine stimulates the CNS excessively leading to firing of all central neurons synchronously developing epilepsy.

This is followed by severe mental depression resulting in suicidal tendencies.

Therefore, Reserpine is never prescribed for immediate quietening of maniac patient

f) **Thiouracil compounds should be cautiously given to pregnant or lactating women.**

Thiourea and related thiouracil compounds cause considerable decrease in hormone synthesis by the thyroid.

In pregnant women they will cross the placenta and may cause foetal goiter.

Also they are excreted via the milk and may cause goiter of the suckling infant.

So, Thiouracil compounds should be cautiously given to pregnant or lactating women.

g) **During the treatment of epilepsy**, **drugs should be withdrawn gradually.**

Epilepsy is a neurological disorder characterized by paroxysmal short recurrent periodic attacks of motor, sensory or psychological mal function.

The drugs used for the treatment of epilepsy require long term administration in order to prevent epileptic attacks.

Since the antiepileptics mainly act by depressing the CNS, they may lead to recurrence of epileptic attack if withdrawn suddenly.

So, during the treatment of epilepsy, drugs should be withdrawn gradually.

h) **Antibiotic treatment is sometimes combined with lactobacillus preparation.**

Antibiotics are chemical substances produced by micro organisms having property of inhibiting the growth of or destroying other microorganisms in high dilution.

When antibiotics are given for the treatment of diseases, they also affect/kill the microflora of the large intestine.

This may lead to severe diarrhoea as its side effect.

This diarrhoea can be prevented by combining the antibiotic with lactobacillus in order to balance intestinal microflora.

i) **Quinine should be cautiously used in pharmacotherapeutics.**

Quinine is an alkaloid obtained from Cinchona.

It is used as an antimalarial as it suppresses the schizogony of malarial parasite.

But it has severe side effects like cinchonism (flushed skin, blurred vision, tinnitus, dizziness, nausea, vomiting and diarrhea), GI upset, hypersensitivity and bone marrow depression(leucopenia, agranulocytosis, thrombocytopenia).

So, quinine should be cautiously used in pharmacotherapeutics