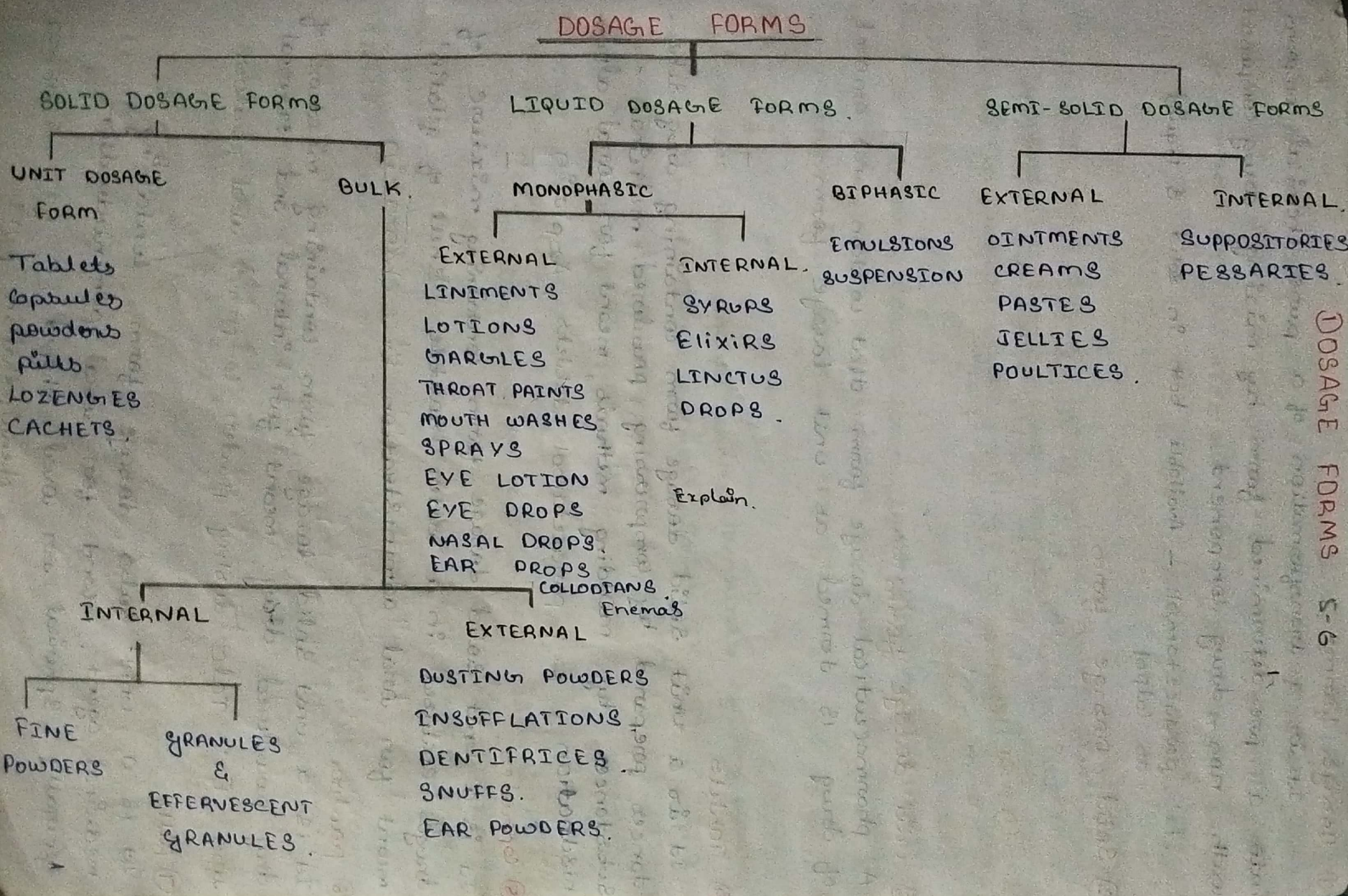


INDEX

NAME: AKASH.H.N. STD: SEC: ROLL NO.: SUB: CENTICS

S. No.	Date	Title	Page No.	Teacher's Sign / Remarks
AKASH.HN PHARMA D 1st Yr Ceutics NOTES				

10 mark important concepts



- ① Tablets - paracetamol, Aspirin
- ② Capsules - chloroquin
- ③ powders - compound oral powder, talc dusting powder
- ④ pills - phenolphthalein pills, Yogi Konthika
- ⑤ Lozenges - Bismuth lozenges
- ⑥ Cochets - Sodiumamino Salicylate, Cochets, Isoniazid
- ⑦ Fine powders -
- ⑧ granules - penicillin salts
- ⑨ Dusting powder - salicylic acid DP
- ⑩ Enneuplation - me
- ⑪ Dentifrices -
- ⑫ Snuff's -
- ⑬ Liniments - soap liniments, white liniments
- ⑭ Lotions - calamine lotion, Salicylic Acid Lotion
- ⑮ Gargles - Aspirin gargles, KCl gargle
- ⑯ Throat paints - Mondl's paint, Boroglycerin
- ⑰ Mouth washes - phenol gargle, KCl gargle
- ⑱ Sprays - Isoprenaline spray, Adrenaline
- ⑲ Eye lotion - Sodium bicarbonate
- ⑳ Eye drops - cocaine eye drops
- ㉑ Nasal drops - ephedrine nasal drops
- ㉒ Ear drops - phenol ear drops, H_2O_2 ear drops
- ㉓ Colloids - saloetin paine
- ㉔ Enemas - paraldehyde enema, soap enema

Syrups - Lemon Syrup, Raspberry Syrup
Elisirs - paracetamol Elisir, Ephedrine Elisir
Linatus - codeine Linatus, norepine Linatus
Drops - Cod liver oil
Emulsion - Cod liver oil Emulsion
Suspension - Milk of Bismuth
Ointments - Calomine ointments, Citrimide ointments
Creams - Citrimide creams, hydrocortisone cream
Pastes - Coal tar paste, $MgSO_4$ paste
Jellies - Ichthammol Jelly, phloflavin Jelly
Poultices - $MgSO_4$ paste
Suppositories - glycerol suppositories, Aminophylline
essaries - Lactic acid pessaries, nystatin

① Dosage forms

It is a transformation of a pure chemical compound into a pre-determined form by mixing drug component with non-drug component.

Ex: paracetamol - Available both in solid & liquid as Calpol

② Solid - Dosage form

③ unit dosage form

A pharmaceutical dosage form that contains unit amount of drug is termed as unit dosage form.

④ Tablets

It is a unit solid dosage form containing drug substances prepared by compressing powdered medicinal substances by molding methods, meant for oral administration. Ex: paracetamol tablets, Aspirin

⑤ Capsules

It is a unit solid dosage form containing mixture of drugs enclosed in a water soluble 'shell of gelatin' meant for oral administration. Ex: Chloraxin

⑥ powders

It is a unit solid dosage form containing mixture of dry powdered drug, meant for internal and external use. Ex: Talc dusting powder, compound oral powders

⑦ pills

It is a unit solid dosage form containing medicinal agent, meant for oral administration. Generally spherical or oval shaped. Ex: Yogi Kanthika phenolphthalein pills

⑧ Bulk dosage form.

A pharmaceutical dosage form where a portion is removed from its bulk as dosage form.

⑨ Granules.

It is a solid dosage form, where dried granules are supplied in single-dose sachets, which are dissolved in water before taking. Ex: penicillin salts.

⑩ LOZENGES.

It is a solid dosage form containing mainly sugar and gum. They are intended to be dissolved slowly in mouth. Ex: Bismuth lozenges.

⑪ ⁺Cachets

Cachets are solid dosage form consists of dry powder enclosed in a shell. Small shells are made up of rice flour and H_2O to enclose powders. Ex: Sodium amine Salicylate Cachets.

⑫ Dusting powders

It is a solid dosage form meant for external application to the skin for antiseptic, antipruritic, antiperspirant, absorbent, protective and lubricant purpose. Ex: Salicylic acid dusting powder.

⑬ Insufflations

These are the finely divided powders meant for introduction into the body cavities such as ears, nose, teeth, sockets and vagina with the help of an apparatus known as Insufflator.

Ex:-

(14) Dentifrices

These are substances which are generally used with the help of toothbrush for cleaning the surfaces of the teeth. They are available in the form of fine powder & pastes. Ex:

(15) SNUFFS

Snuffs are finely divided solid dosage form of medicament which are inhaled into the nostrils for their antiseptic action. Ex.

(16) Liquid dosage forms

(17) Liniments

Liniments are liquid preparation meant for external application to the skin applied by rubbing. Should not be applied to the broken skin. Ex: Soap liniment, white liniment.

(18) Lotions

Lotions are liquid preparation meant for external application to the skin without friction. They usually contain Alcohol & glycerin because alcohol produces cooling sensation where as glycerin keeps skin moist. Ex: Calamine lotion, Salicylic acid lotion.

(19) Gargles

Gargles are liquid preparation used for the treatment of throat infections. They are brought into intimate contact with the mucous membrane of the throat and are allowed to remain there.

for a few moments after which they are thrown out of the mouth. Ex: Aspirin gargles

20 Throat paints

Throat paints are viscous liquid preparations used for mouth and throat infections. Glycerin is commonly used as a base because of its viscous nature and agreeable taste. Ex: Mond's paint
Base glycerin

21 Mouth washes

Mouth washes are liquid preparations usually aqueous solution in concentrated form with a pleasant taste and flavour used for rinsing, deodorant, and antiseptic action. Ex: Phenol gargle
Ker gargle

22 SPRAYS

Sprays are liquid preparations of medicaments in aqueous, alcoholic or glycerin containing vehicle and are meant for application to the nose or throat by means of an atomiser. Ex: Isoprenaline spray

23 Eye lotion

Eye lotions are aqueous simple isotonic solution which is sterile for first aid purpose and non-sterile for intermittent domiciliary administration.

Ex: Sodium bicarbonate
Sodium chloride

24 Eye drops

Eye drops are sterile aqueous or oily solution intended for installation into the conjunctival sac. Local and symmetric action.

Ex: cocaine eye drops

25. Nasal drops

Nasal drops are aqueous solution for installation into Nostrils. They are commonly used for their Anti-inflammatory, Anti-bacterial, Anti histamine.

Ex: ephedrine nasal drops

26. Ear drops

Ear drops are aqueous solution for installation into the ear. They are used for mild infection softening wax, cleansing purpose. Ex: phenol eardrops, H_2O_2 ear drops

27. Colloids

Colloids are liquid preparation meant for external application to the skin. They are convenient application for small cuts. They are also used when prolonged contact b/w skin and medicament is required. Ex: Salactin paint

28. SYRUPS

Syrups are saturated solution of sucrose in purified H_2O . Concentration of sugar is 66%. Syrups are sweet viscous preparation. The syrups containing medicinal substances are called 'medicated syrups'.

Ex: Lemon Syrup

Raspberry Syrup

29. ELIXERS

It is sweetened hydroalcoholic liquid preparation. It may be medicated or non-medicated. Main ingredients are C_2H_5OH & H_2O , meant for oral administration. Ex: paracetamol elixir.

(30) Linctus

Linctus are Sweet, viscous, liquid preparation. They are employed for the treatment of cough. They are swallowed slowly in small doses without addition of water. Ex: Ecodine linctus

(31) Drops

Drops are liquid preparations where vitamin A and D concentrated in fish-liver oil are presented as drops for oral administration. Ex: Cod liver oil

(32) EMULSION

An Emulsion is a biphasic liquid preparation containing two immiscible liquids, one of which is dispersed as minute globule into other.

Ex: cod liver oil emulsion
liquid paraffin emulsion

(33) Suspension

Suspension are the biphasic liquid preparation in which finely divided solid particles are dispersed in a liquid. Ex: Milk of Bismuth

(34) Semi-solid dosage form

(35) OINTMENTS

Ointments are semisolid preparation contain medicament dissolved, suspended or emulsified in the base meant for application to the skin or mucous membrane. Ex: Calomine ointment

Benzoic Acid ointment.

(36) Creams

creams are semi-solid preparation. they have lighter body than ointments, due to the presence of water soluble bases. they can easily be removed from skin meant for application to the skin. Ex: cetrimide cream

(37) pastes

pastes are semi-solid preparation contain large amount of finely powdered solids such as CaCO_3 , starch etc which provides protective coating meant for external application to the skin. Ex: MgSO_4 paste
coal tar paste

(38) JELLES.

Jelles are ^{transparent} semi-solid preparation meant for external application to the skin on mucous membrane. used for lubrication and as contraceptive jelles. Ex: proflavin jelles
ichthammal jelles

(39) Poultices

poultices are semi-solid dosage form used for reducing inflammation and it tends to draw infectious materials from diseased tissue because of absorptive and hygroscopic character of ingredients meant for external use. Ex: lactic acid pos
magnesium sulphate paste

(40) Suppositories

Suppositories are semi-solid dosage form meant to be inserted into the body ^{cavity}. It is useful when drug cannot be tolerated orally. It provides either a local or systemic therapeutic effect.

Ex: glycerol suppositories

Q1) PESSARIES

Pessaries are - Solid unit dosage form of medicament meant for introduction into the vagina. It when inserted into the cavity melts to release the medicament. Ex: Lactic acid pessaries.

Q2) Define prescription. with the help of an ideal example describe the importance of all the parts of prescription.

Ans: - Prescription is an order written by a registered medical practitioner to a pharmacist to compound and dispense a specific medication for the patient.

General Hospital.

Date: - 25/9/2000.

Name: - Pavan Kumar

Age: - 40 years

Sex: - male

Address: - 887, Sector 20, Chandigarh.

Rx (Superscription).

Potassium Bromide 8 gm

Tincture Nomic 8 ml

Chloroform water 120 ml

(Inscription).

Fiat Mistura (Subscription)

Sig: Cochlear magnum 2x in die post cibis Sumenda (Signature).

(Signature of prescriber)

Aggarwal, MD

Regd No: 10234.

① Date:

Date must be written on the prescription by the prescriber at the same time when it is written. The date on the prescription helps a pharmacist to find out the cases, when prescription is brought for dispensing long time after its issue. Prescriptions containing narcotic drugs must bear the date. The prescription should be filled with a reasonable time after it is written. If prescription is brought for filling after 2-3 days from the date when it is written pharmacist must question the intention of the prescriber and needs of the patients can still be met.

② Name, Age, Sex and Address of the patient

These must be written on the prescription. If it is not written then the pharmacist himself should ask the patient about these particulars and put down at the top of the prescription. This avoids possibility of giving the finished product to a person other than the one it is meant for. Patient full name must be written.

Age and sex of the patient specially in the case of children helps the pharmacist in checking the medication and the dose. Therefore there will be less danger of its being administered to the wrong member of hospital ward having similar names. The address of the patient is recorded to help for any reference at a later stage to contact the patient or to deliver the medication properly.

③ Superscription

The Superscription is represented by a symbol Rx which is always written at the beginning of the prescription. According to mythology, symbol was considered as a prayer to Jupiter, god of healing, for quick recovery of the patient. But now this symbol is understood as an abbreviation of the latin word "recipe", meaning "you take".

④ Inscription

This is the main part of the prescription. It contains the names and quantities of the prescribed ingredients. The names of the ingredients are written each on a separate line, followed by the quantity ordered and the last item written is generally the vehicle. In complex prescriptions containing several ingredients the inscription is divided into three parts:

- ① Active medicament which is intended to produce the therapeutic effect
 - ② Adjuvant to enhance the action of medicament
 - ③ The vehicle used to dissolve solid substances.
- Now a days only few prescriptions are compounded by pharmacists. A majority of prescriptions are written for medications already prepared into dosage form by Industrial manufacturers. The pharmacists are only required to dispense the ready-made dosage form of drugs which has eliminated the compounding of prescription.

⑤ Subscription

The part of the prescription contains prescriber's directions to the pharmacist regarding the dosage form to be prepared and number of doses to be dispensed. Since now a days only a few prescriptions are compounded therefore such directions are less frequent.

⑥ Signature

It is usually abbreviated as "sig" on the prescriptions and consists of the directions to be given to the patient regarding the administration of the drug. It usually indicates the quantity of medicament or number of dosage units to be taken, how many times in a day and at what time it should be taken. These instructions must be transferred to the label of the container in which

medicament is dispensed and ensure that the patient follows these instructions carefully.

⑦ Signature, Address and Registration no of prescriber
All other parts of the prescription may be printed but the prescriber's name must be hand-written and should be signed with ink. This eliminates the danger of dispensing medicament on a spurious order and it authenticates the prescription. The prescription containing narcotic drugs must bear address and registration number of the prescriber. This identifies the special licence to prescribe narcotic drugs.

③ Define pathology. Enumerate different factors affecting selection of dose of a drug. 6-8
Ans: It is a branch of medical science which deals with quantity of drugs which can be administered to produce the required pharmacological actions.

① Age

In determining the dose of a drug the age of an individual is of great significance specially in the young or very old persons. Children and old persons need lesser amount of drug than the standard adult dose because they are unable to excrete drugs to that extent as adults but at the same time children can tolerate relatively large doses of ~~drugs~~ on the basis of their body weight as compared with adults. Newborn infants are abnormally sensitive to certain drugs because of the immature state of their hepatic and renal function by which drugs are normally inactivated and eliminated from the body.

② **Body weight** : Generally recommended adult doses are based on a 'normal' body weight of 70 kg. But such a dose will be too less for a muscular person weighing 100 kg and too large for a weak person weighing about 50 kg. The calculation of doses for children on the basis of body weight is considered. Doses calculated according to body weight are expressed as mg/kg body weight.

③ **Sex** : Generally females requires lesser dose than males because of their lesser weight and also due to the reason that they are more responsive to the effect of certain drugs than males. Drugs should be given very carefully during menstruation, pregnancy and lactation. Drugs which stimulate contraction of uterus should be avoided in pregnant ladies which may lead to abortion. Drugs like alcohol, narcotic and non-narcotic analgesics etc. which are readily transported from mother to fetal circulation should be avoided. These drugs produce adverse effects to the foetus. Sometimes resulting in death of the foetus in the uterus. During lactation, drugs such as antihistamines, morphine which are excreted in milk should be given very cautiously to the mothers who are breast-feeding the babies.

④ **Route of Administration**

The dose of a given drug may vary according to the dosage form and route of administration used. Drugs administered intravenously enter the blood stream directly hence require lesser dose than the oral dose.

⑤ **Time of Administration**

Drugs are rapidly absorbed from the empty stomach. Hence effective drug taken before a meal may be ineffective. So it is administered during or after a meal. Irritating drugs are better tolerated if administered after a meal which will dilute drug's

concentration and reduce gastric irritation

⑥ presence of disease

Drugs are more effective in diseased condition than normal body condition. During fever one can tolerate high doses of antipyretics. ~~then in a~~. Similarly during hepatic or renal disturbances, the drugs which are metabolised in the liver and excreted through the kidney may prove fatal.

⑦ Environmental Factors

Alcohol is better tolerated in cold environments than in summer. Dose of sedative required to produce sleep during day time is much more than the dose required to produce sleep during night.

⑧ Emotional Factors

Females are more emotional and responsive to drugs therefore require less dose of drugs. The faith inspired by the doctor on the mind of a patient is an important factor in medication.

⑨ Accumulation

When a drug is repeatedly administered for a long time, depending on its nature, it may unexpectedly accumulate in the body to produce sudden toxic symptoms. The drugs which produce such symptoms of poisoning are called cumulative drugs. The cumulative effects are usually produced by unexpected rapid absorption of drugs. Cumulative effect is desirable in drugs like chloroquin which are used in cases of malaria.

⑩ Synergism

When two or more drugs are used in the combined form their action is either increased or decreased depending on the drugs used in combination. When the duration of action is increased, the phenomenon is called synergism.

(11) Antagonism

When the action of one drug is opposed by the other drug, the phenomenon is known as antagonism. The total combined effect is less than the algebraic total effect of two drugs.

(12) Habituation and Addiction

(1) When repeated use of drugs leads to production of emotional or psychological dependence is known as habituation. When such agents are withdrawn the individual can carry on his routine work. Here there is no physical dependence, hence it can be easily tackled.

(2) It is a state of psychic and physical drug dependence. Continuous use of alcohol, cocaine, heroin, morphine leads to addiction. The addicts are deeply attached to the drug and become slave of it.

(13) Idiosyncrasy

All persons do not respond alike to the same drug due to varied individual susceptibility. Some may produce abnormal reaction to a drug, when an abnormal reaction is produced by a drug it is known as idiosyncrasy.

(14) Hypersensitivity

It is an allergic reaction to a drug. This is due to frequent use of drugs like antibiotics, vitamins and especially proteinous substances.

(15) Tolerance

When a drug administered in an ordinary dose fails to produce the normal therapeutic effect and requires large dose of the drug to produce the normal effect, the unusual resistance thus produced is known as tolerance. Smokers can tolerate nicotine, alcoholics can tolerate large doses of alcohol.

4) Define and Classify Suspension? write the advantages and disadvantages
Ans: Suspensions are biphasic liquid dosage form meant for oral administration, external application, parenteral use. where finely divided solid particles are suspended in a liquid.

① Classification based on administration

- ① oral Suspension
- ② Externally applied Suspension
- ③ parenteral Suspension

② Based on Nature of solid particles

- ① Flocculated Suspension
- ② Non-flocculated Suspension

③ Based on Size of solid particles

- ① Colloidal Suspension (< 1 micron)
- ② Coarse Suspension (> 1 micron)
- ③ Nano Suspension (10 ng)

Advantages

- ① Suspension can improve chemical stability of certain drug
- ② Drug in Suspension exhibits higher state of bio availability
- ③ Suspension can mask unpleasant taste of drug
- ④ Duration and onset of action can be controlled

Disadvantages

① Physical stability and sedimentation can cause problems

② It is bulky, sufficient care must be taken during handling

③ It is difficult to formulate

④ uniform and accurate dose cannot be achieved

⑤ Explain the preparation of suspension containing diffusible and indiffusible solids

I. Suspension containing diffusible solids

① Diffusible solids do not dissolve in water, but on shaking uniform distribution is achieved for sufficiently long time.

② on standing insoluble solids settle at the bottom. Hence it requires re-shaking of the bottle each time whenever a dose is to be measured

③ Hence bottle containing diffusible mixtures must be labelled "Shake well before use"

④ Diffusible solid includes kaolin, magnesium carbonate etc

Method of dispensing

Rx

Light kaolin	2.0 g
Light magnesium carbonate	0.5 g
Sodium bicarbonate	0.5 g
peppermint water	15 ml

Make a mixture and six doses

Type: Mixture containing diffusible solids

- ① Finely powder the diffusible and other substances in a mortar. Mix them thoroughly.
- ② Add small quantity of vehicle and triturate to make smooth cream.
- ③ Then add remained vehicle make up the required volume by adding more vehicle.

II Suspensions containing Indiffusible Solids

- ① Indiffusible Solids donot dissolve in water uniform distribution cannot be achieved for a long period even after shaking.
- ② This difficulty is overcome by increasing the viscosity of the vehicle by adding suspending agent. Tragacanth powder is generally used.
- ③ Indiffusible Solid includes
 oral Suspension: Succinyl Sulphathiazole, Aspirin etc
 Externally used: Calamine, Zinc oxide etc
 Suspension

Method of dispensing

Rx

Succinyl Sulphathiazole	1 g
Light Kaolin	0.6 g
Compound Tragacanth powder	1 g
Raspberry Syrup	2 ml
Benzoic acid Solution	2 ml
Amaranth Solution	1 ml
Chloroform water	10 ml

Make mixture

Type: Mixture containing Indiffusible Solids

- ① Finely powder the Indiffusible substance in a mortar. then add any diffusible solid and tragacanth powder mix thoroughly.
 - ② Then add sufficient amount of vehicle and triturate to produce smooth cream.
 - ③ Then add vehicle to make up required volume.
- 3
- ④ Differentiate b/w Flocculated and Non-Flocculated Substances

Flocculated	Non-Flocculated
① Particles form loose aggregates and form a network like structure	① particles exist as separate entities
② Rate of Sedimentation is high	② Rate of Sedimentation is slow
③ Sediment is rapidly formed	③ Sediment is slowly formed
④ Sediment is loosely packed and does not form hard cake	④ Sediment is very closely packed and a hard cake is formed
⑤ Sediment is easy to redisperse	⑤ Sediment is difficult to redisperse
⑥ Suspension is not pleasing in appearance	⑥ Suspension is pleasing in appearance
⑦ The floccules stick to the sides of the bottle	⑦ They do not stick to the sides of the bottle

⑧ Explain the formulation aspects of Suspension.

① Flocculating Agents

① Flocculating agents decrease Zeta potential of the suspended particle and cause flock formation of the particle

② Both ionic and non-ionic surfactants can be used to bring about flocculation of suspended particle

Ex: Sodium lauryl Sulphate

Electrolytes such as KCl , $NaCl$

② Suspending Agents / Thickening Agents

① It is a substance which are added to suspension to increase the viscosity of the continuous phase so particles remain suspended for a sufficiently long time

Ex: gum acacia

Tragacanth

③ wetting agents

① wetting agents are the substances which reduce the interfacial tension b/w the solid particles and liquid medium thus producing a suspension of desired quality

Ex: Alcohol in tragacanth mucilage

Bentonite

④ Dispersing Agents

① Dispersing Agents are the substances which increase the zeta potential and do not allow the particles to come together to form large particles

Ex:

5

⑤ preservative

① It is a substance which is used to prevent the bacterial growth

② preservatives selected should be effective against a wide range of microorganisms and should be chemically and physically stable

③ It should be nontoxic and compatible with other added substance

Ex: Benzoic acid

Sodium benzoate

⑥ organoleptic additives

① colours, sweetening agents, flavouring agents and perfumes incorporated in suspensions meant for oral and external application must be compatible with other ingredients

Ex: Colours - Coal tar dye and Amaranth

Sweetening agents - Saccharin and Sodium Saccharin

Flavouring agent - Raspberry Syrup & Lemon Syrup

⑦ Define emulsion, write advantages & disadvantages
classify emulsifying agents

Ans: ① An Emulsion is a biphasic liquid dosage form of medicament in which two immiscible liquids are made miscible by the addition of a third substance known as emulsifying agent

② They are used Internally as well as Externally.

① Advantages

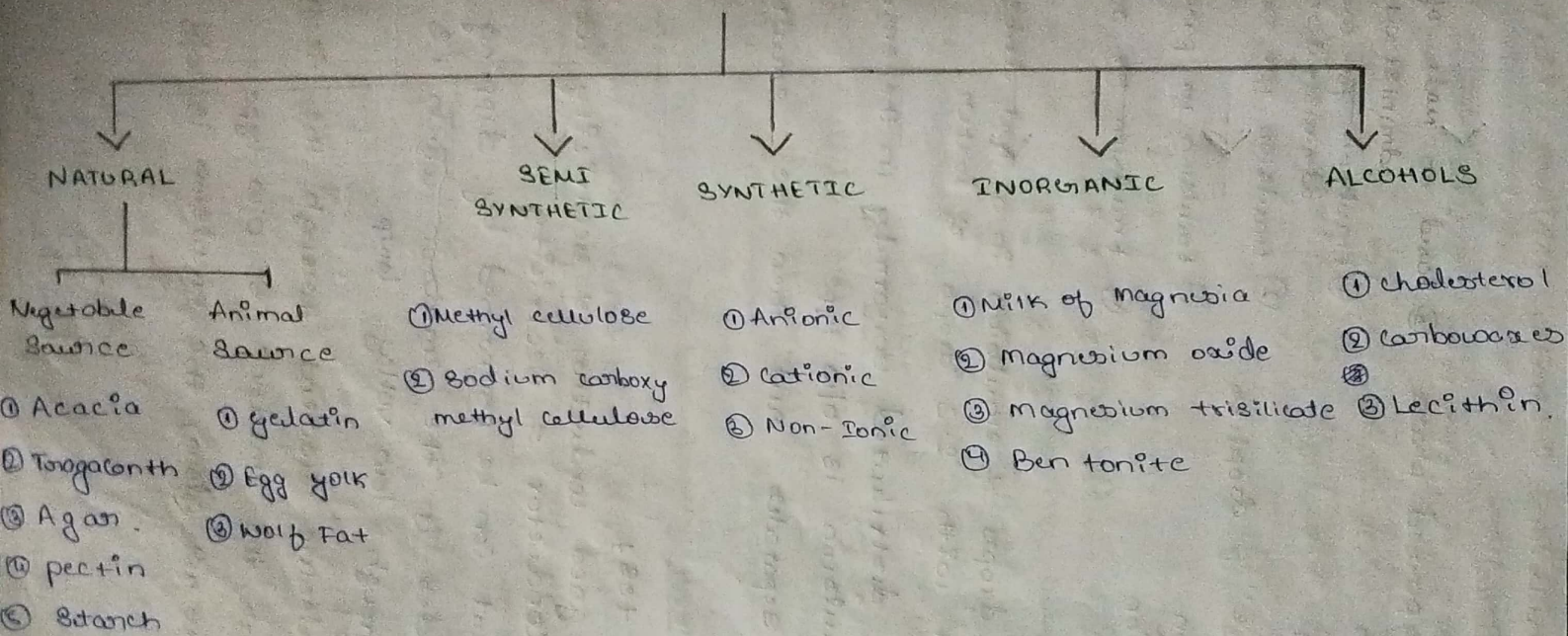
- ① Mask the unpleasant taste
- ② Sustained release medication
- ③ Inert and chemically non-reactive
- ④ Reasonably odorless and last effective
- ⑤ patient acceptance is more.

② Disadvantages

- ① preparation need to shaken well before use
- ② measuring device needed for administration
- ③ Storage condition may affect stability
- ④ Bulky, difficult to transport
- ⑤ Liable to microbial contamination

5:30 - 7:30

EMULSIFYING AGENTS



⑧ Classify emulsion & write various identification test for emulsion.

① Based on Dispersed phase

(i) oil in water

(ii) water in oil

② Based on size of droplets

(i) Micro emulsion

(ii) Macro emulsion

③ Based on mode of administration

(1) Emulsion for oral administration

(2) Emulsion for external use

(3) Emulsion for parenteral use

(4) Emulsion for rectal use

① Dilution Test

① Take a few drops of emulsion in a test tube and dilute it with 2-3 drops of water

② If water is distributed uniformly in the emulsion then the emulsion is o/w type

③ If water separates out then the emulsion is w/o type

② Conductivity test

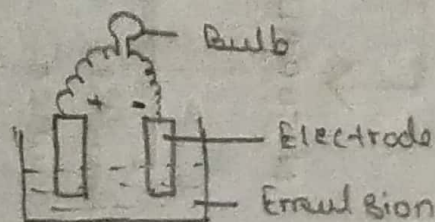
① water is a good conductor of electricity whereas oil is non-conductor of electricity

② Conductivity test can be performed by dipping a pair of electrodes in the emulsion which is connected through low voltage lamp

③ on passing electric current through the electrodes

(i) if bulb glows, the emulsion is o/w type

(ii) if bulb does not glow, the emulsion is w/o type



③ Dye-Solubility Test

- ① Mix Amaranth, a water soluble dye with an emulsion. Take a drop and observe under microscope
- ② If continuous phase appears red it is o/w emulsion
- ③ If scattered globules appears red then it is w/o emulsion.

④ CoCl_2 Filter paper test

- ① When filter paper dipped in CoCl_2 and dried, when dipped in emulsion ~~change~~ its colour changes from blue to pink
- ② This indicates that emulsion is o/w type.

⑤ Fluorescence Test

- ① When oil is exposed to uv rays they exhibit fluorescence
- ② o/w emulsion exhibit spotty pattern
- ③ w/o emulsion exhibit fluorescence throughout the field.

⑥ Explain various methods of preparation of Emulsion

Ans: Emulsion is prepared by following methods

- ① Dry gum method
- ② Wet gum method
- ③ Bottle method

① In dry gum method the oil is first triturated with gum and then water is added to make a primary emulsion

② In wet gum method the water is first triturated with gum and then oil is added to make a primary emulsion

Proportion of	oil	: water	: gum
Fixed oil	4	: 2	: 1
mineral oil	3	: 2	: 1
volatile oil	2	: 2	: 1

Fixed oil: castor oil, cod liver oil

mineral oil: liquid paraffin

volatile oil: Turpentine oil, cinnamon oil, peppermint oil

① Dry gum method

① This method is also known as 4:2:1 method because these figures represent the proportion of oil, water and gum required to prepare primary emulsion.

② measured quantity of oil is transferred to dry mortar.

③ To this add, calculated quantity of acacia and triturate rapidly so as to form a uniform mixture.

④ Then add required quantity of water and triturate rapidly till a clicking sound is produced. This resultant emulsion is known as primary emulsion.

⑤ Then add more of water to produce the required volume.

10

② wet gum method

① The proportions of oil, water and gum are same as for dry gum method.

② In this method, measured quantity of water is transformed to dry matter.

③ To this add, calculated quantity of gum and triturate rapidly so as to form a mucilage.

④ Then add required quantity of oil and triturate rapidly till a clicking sound is produced. This resultant emulsion is known as primary emulsion.

⑤ Then add more of water to produce the required volume.

③ Bottle method

① This method is used for the preparation of emulsion of volatile and other non-viscous oils.

② The emulsion can be prepared by both dry gum and wet gum methods.

③ Because of low viscosity the volatile oils require greater amount of gum for emulsification.

④ The proportions of oil, water and gum for primary emulsion are 2:2:1.

- ⑤ In this method the oil is put in a large bottle and then the powdered dry gum is added. The bottle is shaken vigorously until the oil and gum are mixed thoroughly.
- ⑥ Calculated amount of water is added and mixture is shaken vigorously until primary emulsion is formed.
- ⑦ Then add more water to produce the required volume.

⑩ Explain instability of emulsion & discuss them with cause and precaution to avoid them.

Ans: The following three changes usually occur during the storage of an emulsion.

- ① Cracking.
- ② Creaming
- ③ phase inversion

① Cracking

① Cracking means the separation of two layers of disperse and continuous phase due to the union of disperse phase globules.

② It is difficult to redispense by shaking.

Cracking occurs due to

① By addition of emulsifying agent of opposite type.

- ① Soaps of monovalent metals produce o/w type emulsion
- ② Soaps of divalent metals produce w/o type emulsion
- ③ But the addition of monovalent soap to divalent soap emulsion leads to cracking of emulsion.

(ii) By decomposition of emulsifying agent.
① when acid is added to alkali soap emulsion it causes the decomposition of an emulsifying agent and thus leads to cracking of emulsion.

(iii) By addition of common solvent. 12
① when common solvent is added to the emulsion it dissolves dispersed phase, emulsifying agent and continuous phase, results in formation of clear solution. This leads to cracking of an emulsion.

(iv) By microorganisms.

① If emulsion is not stored properly, they may develop bacterial growth. This leads to cracking.

② Hence, emulsion which are required to be stored for a long period, should be suitably preserved.

(v) Change in temperature

① Rise in temperature of the emulsion reduces viscosity and encourages creaming.

② Emulsion stored at a very low temperature freezing of water content takes place, subsequent melting of ice and shaking may reform the emulsion.

(2) creaming.

① It is defined as upward movement of dispersed globules to form a thick layer at the surface of the emulsion.

② It can be re-distributed by mild shaking or stirring.

According to Stoke's law, the rate of creaming depends on number of factors which can be explained by following equations

$$V = \frac{2r^2(d_1 - d_2)g}{9\eta}$$

13

V = rate of creaming

r = radius of globules

d_1 = density of dispersed phase

d_2 = density of continuous phase

g = gravitational constant

η = viscosity of the dispersion medium

(i) Radius of globules

① The rate of creaming is directly proportional to the radius of the globules

② Larger the size of the globules, the more will be creaming and smaller the size of the globules, lesser will be creaming

(ii) Difference in density of disperse phase & continuous

① The rate of creaming is directly proportional to difference in density of disperse phase & continuous phase

② Greater the difference more will be the creaming.

(iii) viscosity of the dispersion medium

① The rate of creaming is inversely proportional to the viscosity of the dispersion medium

② viscosity can be increased by adding dragocanth and Accacia

⑤ phase inversion

① It means change of one type of emulsion into another type, i.e. o/w type to w/o type or vice versa.

② It may due to following reactions

- (i) By the addition of an electrolyte
- (ii) By changing phase - volume ratio
- (iii) By temperature change
- (iv) By changing the emulsifying agent

③ phase Inversion is minimised by

- (i) keeping the conc of disperse phase b/w 30 to 60%
- (ii) Storing emulsion in a cool place
- (iii) By using proper emulsifying agent

⑪ Define Suppositories ? what are the advantages and disadvantages of Suppositories ? Explain various types of Suppository base

Ans: Suppositories are semi-solid dosage form meant to be inserted into the body cavity. It is useful when drug cannot be tolerated orally. It provides either a local or systemic therapeutic effect.

Advantages.

- (i) They can easily administered to children, old person who cannot swallow drug easily
- (ii) Suppositories are unit dosage form of drug.
- (iii) These are convenient mode of administration of drug
- (iv) Drugs in Suppositories are slowly absorbed and gives sustained action.
- (v) Suppositories inserted into the rectum exert direct and rapid action

Disadvantages

- ① Suppositories cause embarrassment to the patient
- ② Suppositories are required to be stored at low temperature (10° to 20°C).
- ③ Suppositories cannot be prepared easily
- ④ Much irritant drugs can't be administered

Types of Suppository Bases

① OILY BASES.

① Theobroma oil.

① It is also known as cocoa butter, obtained from Theobroma cocoa.

② It is a yellowish white solid.

③ It has a melting point of 30 to 35°C .

④ It is a mixture of fatty acids.

Advantages

① It has butter like consistency & chocolate like colour.

② It melts at body temperature

Disadvantage

① overheating changes its physical characteristics

② It has tendency to adhere to sides of the mould.

② Emulsified Theobroma oil

① It is used as a base when large quantities of aqueous solutions are to be incorporated

② use of glyceryl monostearate, cetyl alcohol, and bees wax is recommended for emulsified theobroma oil suppositories

(ii) Hydrogenated oils.

As a substitute of theobroma oil a no. of hydrogenated oils are recommended

Ex: coconut oil, palm oil, peo oil.

Advantages

- (i) Lubrication of the mould is not required
- (ii) Their water absorbing capacities are good

Disadvantages.

- (i) on rapid cooling they become brittle
- (ii) when melted they are more fluid than theobroma oil

2. WATER SOLUBLE and WATER MISCIBLE BASES.

(i) glycerol-gelatin

(i) glycerol-gelatin base is a mixture of glycerin and water which is made stiff by the addition of gelatin

(ii) Stiffness depends on proportion of gelatin used, which is adjusted according to type of preparation

Advantages

- (i) desirable Suppositories can be prepared with it
- (ii) Base being hydrophilic, slowly dissolves in aqueous preparation

Disadvantages

- (i) They are hygroscopic must be stored in well closed containers.
- (ii) They support bacterial and mold growth.

II Soap - glycerin Suppositories

- ① In glycerogelatin base the gelatin is replaced with soap, which makes the glycerin sufficiently hard for suppositories.

Advantage

- ① Soap helps in evacuation action of glycerin.

Disadvantage.

- ① They are hygroscopic must be stored in well closed container.

III polyethylene glycols

- ① It is widely used in commercial manufacture of suppositories.

- ② They are commonly known as carbomers.

- ③ Depending on molecular weight they are available in different physical forms.

Advantages

- ① Chemically stable, physiologically inert, do not allow bacterial growth.

- ② Suppositories of varying melting point can be prepared.

③ EMULSIFYING BASES

- ① Massa Euterinum

- ① It is a mixture of mono, di and triglycerides of saturated fatty acids.

- ② It has a melting point of 30 to 35°C.

- ③ It is a white brittle, odorless and tasteless solid.

(i) Witepsol

(ii) They consist of triglycerides of saturated vegetable acid with esters

(iii) A small amount of beeswax is added for use in hot climates.

(iv) Massupol

(i) It consists of glyceryl esters, to which a small amount of glyceryl monostearate has been added to improve its water absorbing capacity

The above mentioned synthetic compounds have advantages over cocoa butter

(i) overheating does not alter physical characteristics

(ii) They do not stick to the mould

(iii) They do not require previous lubrication

(iv) They absorb fairly large amount of aqueous liquids.

(v) Describe various methods used for the preparation of suppositories

Ans (i) Rolling method

(i) It is an ancient method of preparing the suppositories

(ii) The suppository base is rolled and then desired shape is given with the hand.

(iii) This method is not used nowadays.

② RUSSON METHOD

- (i) Thoroughly clean and lubricate the mould with a suitable lubricant. Keep it on ice in the inverted position to cool and drain an excess of the lubricant
- (ii) Heat the china dish over waterbath. To this add the required quantity of base 19
- (iii) Remove the china dish from waterbath, when two-third of the base melts and stir thoroughly until whole of the mass melts
- (iv) pour weighed quantity of powdered medicament into a china dish and mix thoroughly
- (v) warm the china dish over waterbath for few seconds with constant stirring, so that mass becomes pourable.
- (vi) pour the melted mass into the cavities of the Suppository mould kept over the ice.
- (vii) Fill each cavity to overflowing, in order to prevent the formation of hollows in the top of finished suppositories.
- (viii) Remove the excess of mass with the help of sharp knife
- (ix) keep the mould over ice for 10 to 15 min
- (x) open the mould and remove the suppositories
- (xi) wrap the individual suppository in a wax paper

Ex. *Hydrocortisone*

Boric acid

200mg

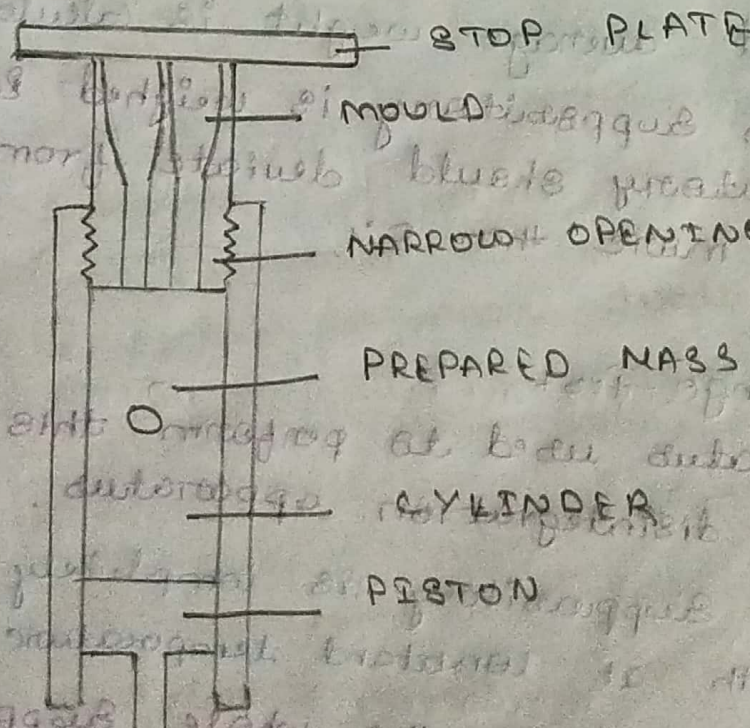
Theobromo oil

Q13.

Make the suppositories
send 8 suppositories of 2 g each

③ COLD COMPRESSION METHOD

- ① This method is useful for thermolabile and insoluble drugs
- ② In this method mass is prepared by first mixing the powdered drug with an equal amount of grated cocoa butter and then incorporating the remaining amount of grated cocoa butter
- ③ The prepared mass is placed in a cylinder and forced through a narrow opening by means of piston
- ④ The mass passing into mould are compressed until a homogeneous fused mass is formed
- ⑤ On the removal of stop plate suppositories are ejected by further pressure



Packing

- (i) Suppositories are usually packed in shallow partitioned cardboard boxes
- (ii) Commercial suppositories are packed separately in aluminium foil.

Storage

- (i) The suppositories are required to be stored in a cool place.

21

(13) Explain various Evaluation test for suppositories
Ans: The test performed on suppositories includes

- (i) Uniformity of weight test
- (ii) All the suppositories should be uniform in weight weight variation results if some units are underfilled
- (iii) To perform this test 20 suppositories is weighed and average weight is calculated
- (iv) Then each suppository is weighed individually no suppository should deviate from the average weight by more than 5%.

(14) Melting Range test

- (i) The apparatus used to perform this test is USP tablet disintegration apparatus.
- (ii) Here the suppository is completely immersed in waterbath at ambient temperature.
- (iii) Then the time for the whole suppository to melt in water is noted.
- (iv) This test is performed for suppositories containing fatty base to check the absorption characteristics.

③ Softening Time test.

- ① The test is performed on rectal suppositories to determine softening time.
- ② During this test a glass rod is placed on the suppository held in U-tube of the apparatus immersed in constant temperature water bath.
- ③ The time taken for the rod to pass through the suppository is recorded as the softening time.

④ Breaking Test.

- ① Breaking Test is carried out to determine the tensile strength.
- ② To assess whether they will be able to withstand the hazards of packing, transporting etc.

⑤ Disintegration Test

- ① This test can be done by using the same apparatus available for test on compressed tablets.
- ② Suppositories prepared with water soluble bases are subjected to these tests.

⑥ Define Displacement value. How will you determine displacement value? Calculate the amount of theobromo oil required to prepare six boric acid suppositories, base of boric acid is 100mg per suppository and displacement value is 0.5.

Ans: Displacement value is defined as "the quantity of the drug which displaces one part of the base"

or

It is the quantity of base displaced by the drug.

Displacement value is determined as follows.

- ① prepare and weigh 6 suppositories containing theobroma oil alone = a g
- ② prepare and weigh 6 suppositories containing 40% medicament = b g
- ③ Amount of Theobroma oil present in medicated suppositories = $\frac{60}{100} \times b = c$ g
- ④ Amount of medicament present in medicated suppositories = $\frac{40}{100} \times b = d$ g
- ⑤ Amount of theobroma oil displaced by d g of medicament = $(a - c)$ g

∴ Displacement value of medicament = $\frac{d}{(a - c)}$

Sl. No	Ingredients	official formula	working formula
①	Boric acid	120 mg	0.72g
②	Theobroma oil	Q13	?

④ ~~of~~ ~~#~~ Displacement value = 1.5

If capacity of Mould = 1g

No of suppositories = 6

① wt of Theobromaoil for 1 Suppository = 1g

② wt of Theobromaoil for 6 Suppositories = 6g

③ wt of Boric acid for 1 Suppository ²⁴ = 120mg

④ wt of Boric acid for 6 Suppository = 0.72g

$$\begin{aligned}\therefore \text{quantity of Theobromaoil required} &= \frac{\text{Total amount of base}}{\text{Total amount of drug}} - \frac{\text{displacement value}}{\text{value}} \\ &= 6 - \frac{0.72}{1.5} \\ &= 5.52\end{aligned}$$

⑮ Enumerate the ideal characteristics of a Suppository base.

- ① It should melt at body temperature
- ② It should release the medicament rapidly.
- ③ It should be non-toxic and non-irritant to the mucous membrane
- ④ It should keep its shape when being handled
- ⑤ It should be stable on storage.
- ⑥ It should be compatible with large no of drugs.
- ⑦ It should be stable if heated above its melting point.

- ⑧ It should be easily moulded and it should not adhere to the mould
- ⑨ It should be good in appearance
- ⑩ It should be easily mouldable by pouring

~~Define~~ ~~Extraction~~

10:30 - 12:30

- ⑪ Define Extraction, write neat labelled diagram explain the simple percolation process for extraction of drug.

25

Ans: Extraction may be defined as the treatment of the plant or animal tissues with solvent whereby the medically active constituents are dissolved, and most of the inert matter remain undissolved.

Simple percolation

Simple percolation process is used for preparation of tinctures and liquid extracts

① Size Reduction

- ① The drug to be extracted is subjected to size reduction, usually from coarse powder to fine powder
- ② to increase surface area of drug and for uniform packing in percolator.

② Imbibition

- ① During Imbibition the powdered drug is moistened with suitable amount of menstruum and allowed to stand for 4 hours in a well closed container

⑦ During this period the drug swells up and menstruum penetrates the cell wall.

26

③ packing

① A percolator is a conical vessel having a lid at the top and is provided with a false bottom on which cotton wool is placed

② The base of the percolator is fitted with a stop from which the percolate is collected

③ Moistened drug is introduced and pressed till whole of the drug is packed in the percolator. packing should not be too tight or too loose.

④ After suitable packing of the drug into the percolator a piece of filter paper is placed over it.

⑤ On the above arrangement small quantity of washed sand is placed to prevent disturbance of packed material.

④ Maceration

① After packing, sufficient menstruum is added to saturate the material and top of the percolator is covered with a lid.

② When the liquid begins to drip, the top fitted at its bottom is closed

③ The percolator is then set aside for 24 hrs to macerate the drug.

22

④ This period helps the menstruum to penetrate deep into the tissue and dissolve maximum amount of active constituents.

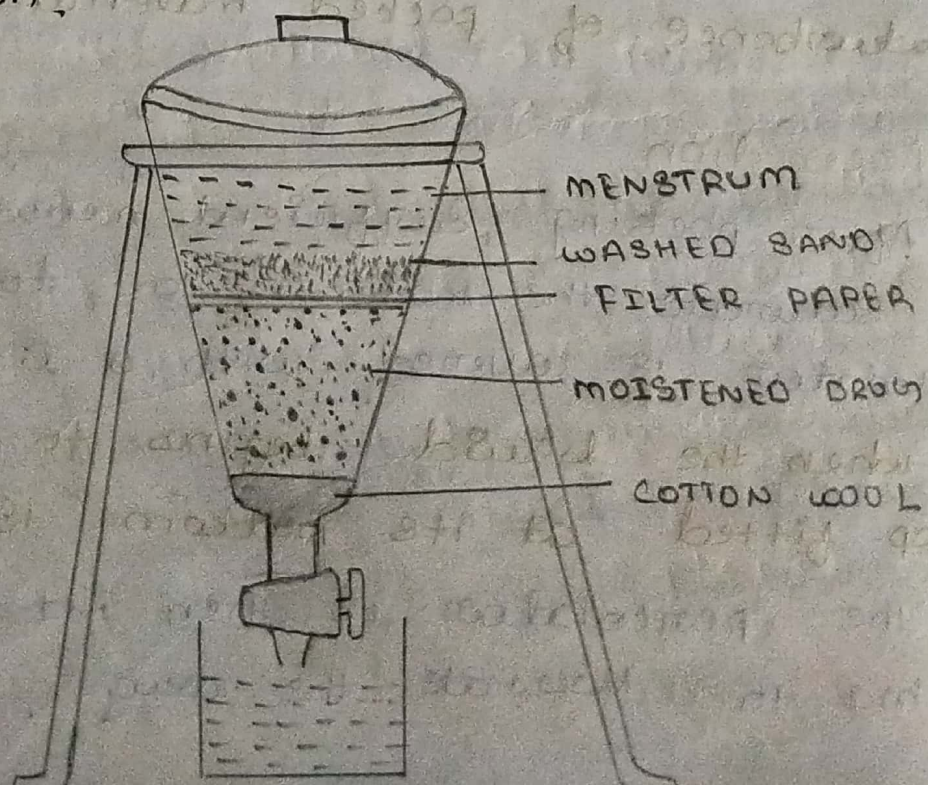
⑤ percolation

① After 2 hours of Maceration of the drug the lower tap of the percolator is opened and liquid collected.

② After collecting $\frac{3}{4}$ th volume. the percolate is tested for complete exhaustion of the drug by various tests.

③ The marc is then pressed and expressed liquid is added to the already collected percolate. More of the menstruum is added to produce required volume.

④ The liquid is then allowed to stand, to settle suspended particles, then it is removed by filtration.



⑪ Explain Modified percolation processes

① Reserved percolation

① It is a percolation process in which first $\frac{1}{4}^{\text{th}}$ of the percolate which contains maximum amount of active constituents is reserved

② second $\frac{1}{4}^{\text{th}}$ of dilute part is then evaporated to get a syrupy consistency, then it is mixed with the reserved portion of the percolate and the final volume is adjusted by adding more of menstrum.

③ This process is used for the preparation of liquid extracts as it yield concentrated preparation as compared to tincture prepared by simple percolation process.

④ Generally alcohol is used as menstrum for reserved percolation processes.

Advantages

① This process is economical

② Mechanically gentle process.

② Continuous hot percolation or SOXHLET EXTRACTION

- ① Continuous hot percolation process is used for those drugs where the penetration of the menstrum into the cellular tissue is very slow and also when quantity of menstrum is very less.
- ② Soxhlet apparatus required for continuous hot percolation is made from a very high grade of glass and consists of three parts
- (i) A flask in which menstrum is boiled.
 - (ii) An extraction chamber in which drug is filled, is fitted with a side tube and a siphon.
 - (iii) A condenser.
- ③ The drug to be extracted is packed in a "thimble" made of filter paper, which is then placed in extractor.
- ④ Menstrum in the flask is boiled and the vapours are allowed to pass through the side tube to the condenser where they are condensed and fall on to the packed drug through which it percolates and extracts its active constituents.
- ⑤ As the volume of menstrum in the extractor increases, the level of liquid in siphon also increases, then it is siphoned out into the flask.

⑥ on further heating, the menstrum vaporizes while the dissolved active constituents remain behind in the flask.

⑦ This process continues until the drug is exhausted.

30

Advantages

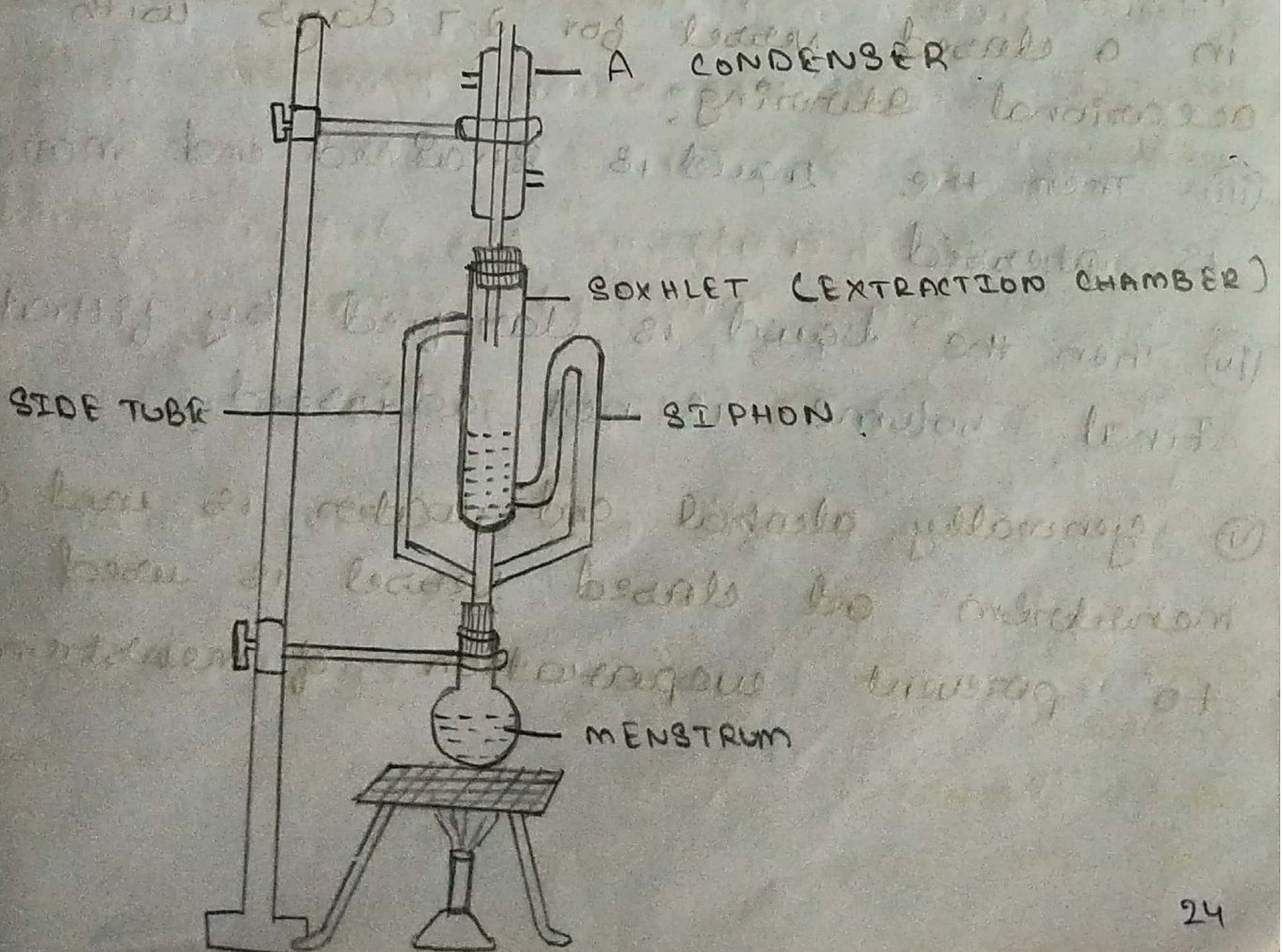
① It is Economical

② Mechanically gentle process

Disadvantages

① It is lengthy process

② Requires Azeotropic mixtures.



Q18 Define Maceration ? Explain Simple Maceration, Maceration with adjustment and Multiple Maceration

Ans:- Maceration is the process of extraction of drug by placing solid drug in contact with whole of the menstruum in a closed vessel for 2-7 days with occasional stirring.

① Simple maceration for organised drug

① Organised drugs are those drugs which have specific cell structure like roots, stem, leaves, flower

② In this process of extraction of drug is carried out by placing the solid drug in contact with whole of the menstruum in a closed vessel for 2-7 days with occasional stirring.

③ Then the liquid is strained and marc is pressed

④ Then the liquid is clarified by filtration. Final volume is not adjusted.

⑤ Generally alcohol and water is used as menstruum and closed vessel is used to prevent evaporation of menstruum.

② simple maceration for unorganised drug, (maceration with adjustment)

① unorganised drugs are those drugs which have no cellular structure and are obtained from plants

Ex: gums, resins

② In this process the extraction of drug is carried out by placing the solid drug in contact with $\frac{1}{5}$ th of menstrum in a closed vessel for 2-7 hours with occasional stirring.

③ Then the liquid is strained and marc is not pressed.

④ Then the liquid is clarified by filtration. Final volume is adjusted with remaining $\frac{1}{5}$ th of menstrum.

⑤ In case of unorganised drug the marc left behind does not retain any appreciable amount of menstrum. Therefore pressing is not required.

Multiple Maceration

① Repeated Maceration may be more effective than single maceration because an appreciable amount of active constituents may left behind in first maceration may be extracted out in next maceration

① Double Maceration ³³

① Here maceration carried out twice hence total vol of menstruum to be used is divided into two parts

② For first maceration weighed amount of drug is allowed to remain in contact with specified amount of menstruum for a definite time with occasional stirring

③ The liquid is strained and marc is pressed

④ For second maceration marc is allowed to remain in contact with specified amount of menstruum for definite period of time with constant stirring

⑤ The liquid is strained & marc is pressed

⑥ The 1st and 2nd maceration are combined together

⑦ Then the liquid is clarified by filtration

$$\text{Vol of menstium for 1st maceration} = \frac{\text{Total vol of menstium} - \text{vol of menstium retained by the drug}}{2} + \text{vol of menstium retained by drug}$$

② Triple maceration

① Triple maceration process is used when mac cannot be pressed as in double maceration

② Here menstium is divided into three parts & maceration done thrice

$$\text{Vol of menstium for 1st maceration} = \frac{\text{Total vol of menstium} - \text{vol of menstium retained by the drug}}{3} + \text{vol of menstium retained by drug}$$

$$\text{Vol of menstium for 2nd maceration} = \frac{\text{Total vol of menstium} - \text{vol of menstium used for 1st maceration}}{2}$$

③ In this process weighed amount of drug is allowed to remain in contact with calculated amount of menstium for specified time with occasional shaking.

- ④. The liquid is strained and reserved.
- ⑤ Similarly 2nd and 3rd maceration is carried out by adding calculated quantity of menstrum.
- ⑥ The marc is pressed at the end of third maceration and expressed liquid is mixed with liquid obtained from 2nd and 3rd maceration.
- ⑦. Liquid obtained from 2nd and 3rd maceration is evaporated & then it is mixed with 1st maceration.
- ⑧ final vol is adjusted with menstrum.

⑨ Define Infusion and Decoction. Explain equipments used for Infusion and decoction process.

① Infusion.

- ② It consists of pouring water over the drugs and then allowing to keep in contact with water for 15 min with constant stirring.
- ③ Finally solution is filtered and marc is not pressed.
- ④ Boiling water is commonly used as a solvent, since it has greater solvent action than cold water.

Apparatus

- ① Coffee pot or tea pot is the simplest form of apparatus used for preparing infusion.
- ② The drug is placed at the bottom of the pot. water is added and it is well stirred three or four times during the period of infusion. 36
- ③ Infusion can also be prepared by enclosing the drug in muslin bag and then suspending it just below the level of water in a beaker. stirring is not required in this case.
- ④ Special pots known as 'infusion pots' are used for the preparation of infusion. It consists of a large perforated shelf near the top of the pot.
- ⑤ The drug is placed on the perforated shelf. The pot is filled with water and perforated shelf is adjusted below the surface of water.

② Decoction

- ① It is the process in which water soluble and heat stable constituents of hard drugs are extracted with

- ③ water is used as menstruum and drug is cut into small pieces and boiled with menstruum for 10-15 min
- ④ After boiling, the liquid is cooled and filtered more water is passed through the marc to produce the required volume
- ⑤ Adjustment to final volume is necessary to get a uniform product.

Q20 Define menstruum & marc? Explain various menstruum used in extraction process.

- ① The solvent used for extraction is known as "menstruum"
- ② The inert insoluble material that remain after extraction is called "marc"
- ③ water as solvent.
- ①. water is used as a solvent for the extraction of many type of active constituents such as proteins, gums, colouring agents, Sugars.
- ② It can also dissolves enzymes, organic salts and organic acids but it cannot dissolve fatty substance like waxes, fats

Advantages.

- ① It is cheap
- ② It is non-toxic
- ③ It is not inflammable
- ④ It has a wide solvent action

Disadvantages

- ① It dissolves a wide range of substances which are undesirable
- ② water helps in growth of mould and bacteria
- ③ water causes hydrolysis of many substances.
- ④ large amount of heat is required to concentrate the aqueous preparations than the non-aqueous preparation

⑤ Alcohol as a solvent

- ① Alcohol can dissolve a large number of chemicals substance such as alkaloids, alkaloidal salts, Resins etc
- ② It cannot dissolve fatty substance like waxes, fats

Advantages.

- ① It is miscible with water.
- ② It is non-toxic
- ③ It does not allow the growth of mould & bacteria
- ④ Small amount of heat is required to concentrate alcoholic preparation.
- ⑤ It dissolves selective active constituents

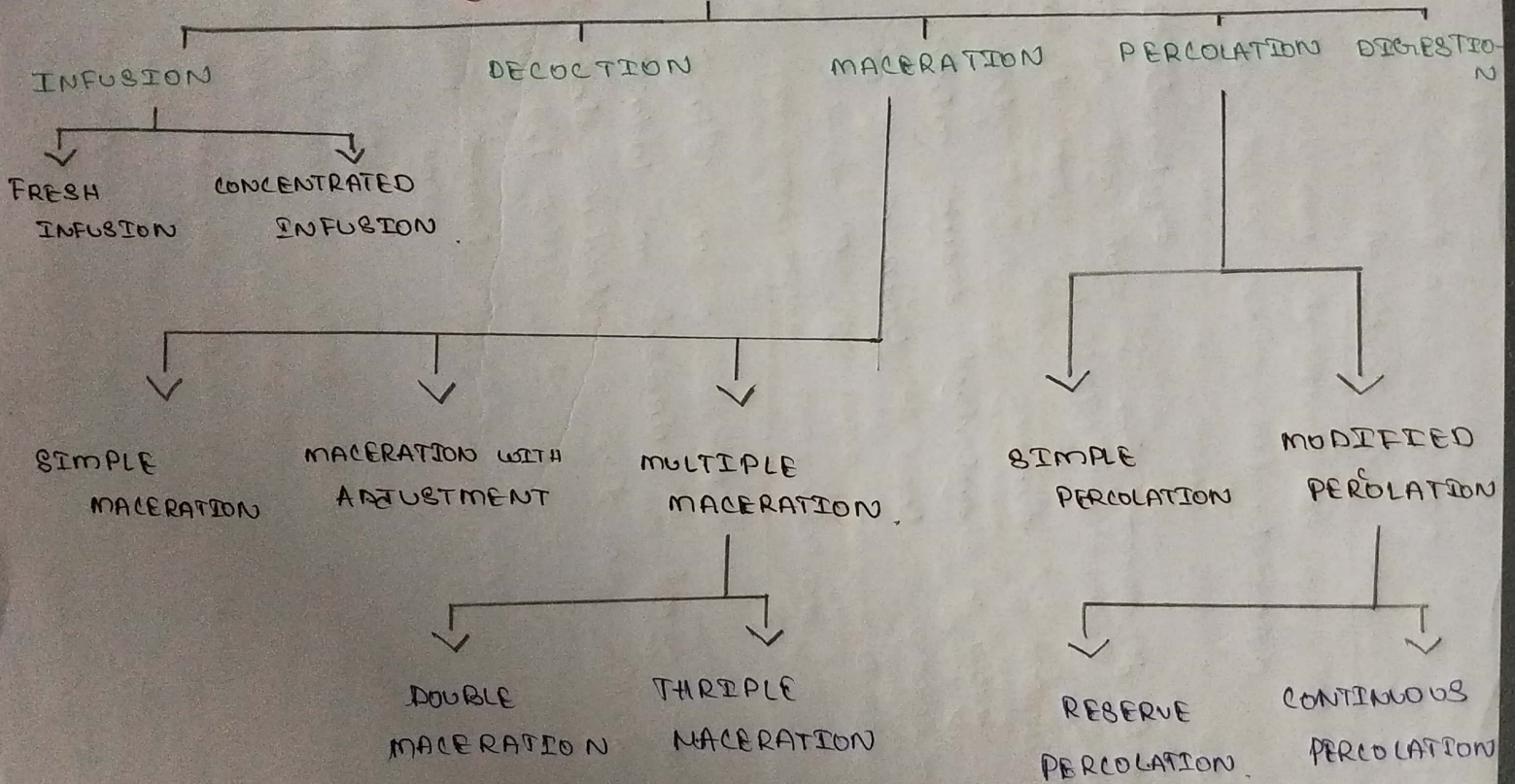
Disadvantages

- ① It is costlier,
- ② It is inflammable

① Define galenicals, classify extraction process with examples

- ① A medicinal preparation composed mainly of herbal or vegetable matter.
- ② It is prepared by extraction of crude vegetable drugs with suitable solvent.
- ① Fresh Infusion': Fresh Infusion of Quassia
- ② Concentrated Infusion': Concentrated Infusion of Quassia
- ③ Simple Maceration': Tincture of orange, Tincture of lemon
- ④ Maceration with adjustment': Tincture of benzoin, Tole.
- ⑤ Double maceration': Infusion of orange
- ⑥ Triple Maceration': Concentrated Infusion of Quassia
- ⑦ Simple percolation': Tincture of Cardamom, ginger

EXTRACTION PROCESS



5 Mark important concepts

① Explain the handling of the prescription write about 10-12 source of errors in prescription

① Receiving
The prescription should be received from the patient by the pharmacist himself. Under no circumstances an unauthorized person should try to receive or read the prescription.

② Reading and checking
A brief examination of each prescription should be made immediately upon receiving it from the patient. This will tell the pharmacist about the dosage form to be prepared and he can estimate the time required for preparing it. If a long time is needed for compounding the prescription then he must tell the patient about the time required so that he may wait or return after some time. In some cases patient's name, age and address may not be written on the prescription in such cases these informations should be enquired from the patient and put down on the prescription.

Careful examination of the prescription should be made only behind the counter. So if there is any doubt regarding the prescription, or if any error in writing the prescription, then the pharmacist should consult the fellow pharmacist on prescription.

Every prescription should be read and understood completely before compounding it. Every word and abbreviation should be read correctly. He should never guess about the meaning of any confusing word. It may lead to serious consequences.

As the number of drugs available in the market are increasing, the mistakes due to similar pronunciation are also increasing. In such case pharmacist has to take a great care specially when prescription received orally.

Before the start of compounding the prescription, the pharmacist must ensure that what he is going to do and what type of finished product he will obtain.

③ Collecting and weighing the Materials
materials to be used in compounding the prescription should be collected on the left hand side and arranged in the order in which they are to be mixed. The materials which are weighed should be shifted to right hand side of the balance. This gives a mechanical check of ingredients which have been weighed. The label on every stock bottle should be read at least 3 times.

- ①. when taken from the shelf
- ②. when contents are removed for weighing
- ③. when containers are returned back to its proper place

④ Compounding

This is the most important phase in handling the prescription. In this case proper drug is dispensed in suitable form. This can be achieved only if accuracy, cleanliness, and proper techniques are observed in the preparation. Only one prescription should be compounded at one time. Attention should not be diverted by engaging in other directions.

Now a days majority of the prescription contains pre-compounded dosage forms. When a prescription requiring compounding is received the pharmacist should decide the calculation, adjuvants and order of mixing then he should proceed further.

⑤ Finishing

The compounded medicament should be filled in suitable container depending on the quantity of the medication to be dispensed and the methods of its use. Various types of containers are used in pharmacy such as round vials, oval prescription bottle, wide mouth bottles etc. The container should be selected approximately of the same volume as that of medication to be dispensed.

Most of the containers are available in various size and shapes. They may be made up of glass, plastic or suitable material.

The filled containers are suitably labelled. A good quality of paper and adhesive should be used for labelling the containers. The size of the label should be proportional to the size of the container and should be neatly hand-written. The following informations should be written on all labels

- ① Name of the prescription
- ② Name of patient, Age, sex
- ③ Registration number
- ④ Date of dispensing
- ⑤ Direction for its use
- ⑥ Expiry date
- ⑦ Storage condition
- ⑧ Name and address of the pharmacy

The label should be placed almost in the centre leaving equal space from the bottom and top of the bottle

After preparing and labelling, the compounded prescription should be thoroughly examined to ensure accuracy, quality and safety of the prescription.

The checker should first check the written prescription and then the contents of the container for label, label, or any other indication for the correctness and quality of the medication. If the checker finds the compounded prescription is correct then he must put his signature on the prescription. Before the prescription is handed over to the patient the container must be thoroughly polished so as to remove the fingerprint.

Source of errors

- ① Abbreviation:- Abbreviation presents a problem in understanding parts of the prescription order.
- ① Abbreviation:- Every prescription should be read and understood completely before compounding it. Every word and abbreviation should be read correctly. He should never guess about the meaning of any confusing word. It may lead to serious consequences.
- ② Name of the drug:- As the number of drug available in the market are increasing the mistakes due to similar pronunciation is also increasing. In such case, pharmacist has to take great care specially when prescription received orally.
- ③ Strength of prescription:- The strength of the preparation should be stated by the prescriber. For example it will be a wrong decision on the part of a pharmacist to dispense paracetamol tablet 500mg when prescription for paracetamol tablet is received with no specific strength.
- ④ Dosage form of drugs prescribed:- many medicines are available in more than one dosage form. For ex: liquid, tablet, capsules, suppository. The pharmaceutical form of the product should be written on the prescription in order to avoid ambiguity (confusion).

⑤ dose: usually high and low doses should be discussed with prescriber. For ex: prescription for sustained release formulation to be administered after every four hours should be thoroughly checked because such dosage forms are usually administered two or three times a day.

⑥ Instructions for the patient: The quantity of the drug to be taken, timings of administration, and route of administration should be clearly given in the prescription so as to avoid any confusion.

⑦ Incompatibilities: It is essential to check that there are no pharmaceutical incompatibilities so that different medicines prescribed for the same patient do not interact with each other to produce any harm to patient.

⑧ Explain the importance of dosage forms

Ans. ① Convenience and therapeutic value.

- ① A smaller quantity of pure drug is difficult to weigh and measure accurately.
- ② Due to definite size, shape, strength, dosage ^{forms} are easy to handle and administer by a particular route of administration.
- ③ A unit dosage form provides greater dose accuracy.
- ④ Attain and maintain stability.
- ① Dosage forms have improved physicochemical stability.
- ② Dosage forms are less prone to microbial contamination.

- ③ Better effectiveness and action.
- ① To protect drugs from pre-systemic degradations
- ② It minimise harmful effects on the body.
- ④. Improved acceptance
- ① For rapid effect in an emergency.
- ② To target a drug to its desired site
- ③. For local or systemic action through body cavity
- ④. For local or systemic action after topical application.
- ⑤ To modify onset and duration of action
- ⑥ To improve palatability.
- ⑤ Ease of production and packing.
- ① Tablets are easy and economic to produce than liquid dosage forms. Injectables requires sterile facilities.

② Dosage forms are convenient to pack and handle.

③ Explain any two formula for calculating child and infant dose

① young's formula.

The formula is used to calculate dose of child below 12 years of age

$$\text{child dose} = \frac{\text{Age (years)}}{\text{Age} + 12} \times \text{Adult dose}$$

If adult dose is 60 mg and the age of the child is 4 years, the dose for the child will be

$$\frac{4}{4 + 12} \times 60 = 15 \text{ mg}$$

② Milling's formula.

The formula is used to calculate dose of child in the range of ages b/w 4 to 20 years

$$\text{child dose} = \frac{\text{Age (years)}}{20} \times \text{Adult dose}$$

If adult dose is 60mg and the age of the child is 6 years, the dose for the child will be

$$\frac{6}{20} \times 60 = 18\text{mg}$$

③ Clark's formula

According to body weight.

$$\text{child dose} = \frac{\text{child's weight (kg)}}{70} \times \text{adult dose}$$

If the adult dose is 60mg and the weight of the child is 14 kg, the dose for the child will be

$$\frac{14}{70} \times 60 = 12\text{mg}$$

④ Fried's formula

$$\text{child dose} = \frac{\text{Age (months)}}{150} \times \text{Adult dose}$$

⑤ Bastedo's formula

$$\text{child dose} = \frac{\text{Age (years)} + 3}{30} \times \text{Adult dose}$$

④ Define and classify powders with their advantages and disadvantages.

Ans: It is a ^{unit} solid dosage form containing mixture of dry powdered drug meant for internal and External use.

Ex: Talc dusting powder, Compound oral powder

Classification

- ① Simple and compound powders for internal use
- ② granular effervescent powders for internal use
- ③ Bulk powders for external use
- ④ powders enclosed in catchets and capsules
- ⑤ compressed powders. (Tablets)

Advantages

- ① Drugs in powder form becomes more convenient for the physician to prescribe specific amount of medicament according to need of the patient.
- ② powders are usually more stable than liquids.
- ③ Incompatibility is less in case of powders than liquids.
- ④ powders undergo rapid dissolution.
- ⑤ large quantity of drugs can^{be} easily administered by mixing with liquids.
- ⑥ They are more easy to carry than liquids.
- ⑦ They are more Economical^{as} compared to other dosage form.

Disadvantages

- ① Drugs which deteriorate on exposure to atmospheric condition are not suitable for dispensing in powder form.

- ② Bitter, nauseous, corrosive and unpalatable drugs cannot be dispensed in powder form.
- ③ Deliquescent and hygroscopic drugs cannot be dispensed in powder form.
- ④ Volatile drugs are not suitable for dispensing in powder form.

⑤ Explain the Simple & compound powders with ex.

① Simple powders

① A simple powder contains only one ingredient either in crystalline or amorphous form.

② when the powder is in the crystalline form it is reduced to fine powders, weighed and wrapped as individual doses

R_x

Aspirin

300 mg.

Make powder. Send such four.

② Compound powders

① Compound powders contain two or more than two substances which are mixed together and then divided into individual doses

R_x

Aspirin

300mg

paracetamol

150mg

cabbeine

50 mg.

make powder send such eight.

Sig: one to be taken, when pain is severe

Type: oral divided powder.

⑥ Explain the preparation of dusting powder

Ans: ① Dusting powders are generally prepared by mixing two or more than two ingredients in which Starch, talc is used as one of the ingredients of formulations.

② Starch being a carbohydrate can support bacterial growth therefore rarely used.

③ The dusting powders are dispensed in sifter top containers

R_x

Purified Talc, Sterilised

50 g

Starch, in powder

25 g

Zinc oxide

25 g

TYPE - Dusting powder,

Theory

① preparation contains Talc which may be contaminated with spores of clostridium tetani. Therefore when talc is to be used in dusting powder, must be sterilised by heating at 160°C

② purified talc has excellent flow and lubricant properties therefore it is used in number of dusting powders.

③ Starch acts as an absorbent

④ Zinc oxide acts as an antiseptic and absorbs moisture

procedure -

- ① weigh the required quantities of Talc, Starch
Zinc oxide.
- ② mix zinc oxide with starch, then incorporate
purified talc. mix thoroughly.
- ③ pass the mixed powder through a sieve no. 120
- ④ pack the powder in sifter-top containers to
protect it from air, moisture and contamination
and well as convenience of application

⑦ Explain the preparation of eutectic powder

- ① when two or more substances are mixed together
they liquefy due to the formation of a new compound
which has a lower melting point than room temp.
- ② The formation of eutectic mixtures signifies
a physical change rather than a chemical change.
- ③ The substance which on mixing liquefy are
methol, phenol, camphor etc
- ④ In dealing with eutectic substances firstly
they may be dispensed as separate set of powders
with directions "one set of each kind shall be
taken as a dose"
- ⑤ Secondly they may be incorporated in powders
by adding an inert absorbent like kaolin,
bentonite, etc.
- ⑥ Generally an equal amount of absorbent as
that of eutectic substance is sufficient to
prevent liquefaction.

① When the substance which liquefy are present in small amount, they may be mixed together so as to form a eutectic mixture, then the liquid so formed is absorbed by adding an absorbent. The remaining ingredients of the prescription are then incorporated and mixed together.

Rx

Menthol

5g

Camphor.

5g

Ammonium chloride

80g

Light magnesium carbonate

60g

③ Sieve no. 85

④ packed in
Air tight containers

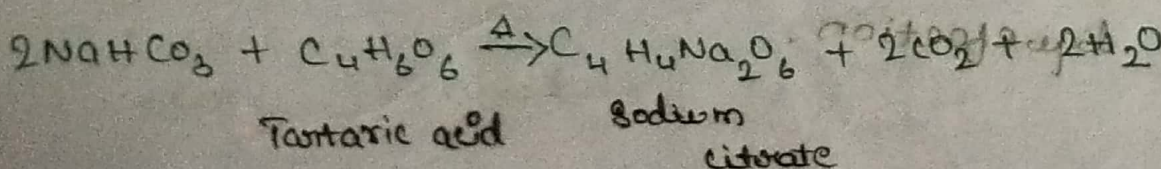
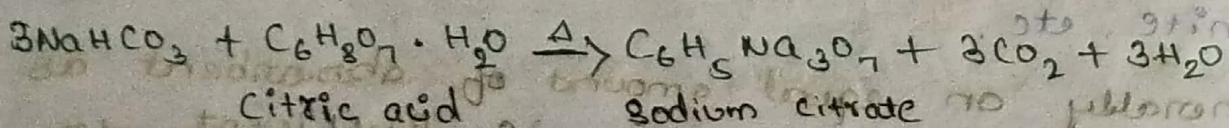
TYPE: compound powder containing liquefiable substance

⑧ Explain the preparation of Effervescent granules

① The ingredients used for the preparation of effervescent granules consist of Sodium bicarbonate, Citric acid, tartaric acid and Sodium acid phosphate.

② Sodium bicarbonate is used to react with acids when the preparation is added to water, leading to the evolution of CO_2 .

③ Tartaric acid is anhydrous whereas citric acid contains one molecule of water of crystallization which is liberated during heating and serves as a moistening agent for the powders during granulation.



methods of preparation

- ① Heat method
- ① A large porcelain evaporating dish is placed over a wooden bath, which is being heated to boiling point
- ② To hot dish powders are added
- ③ The water needed for granulation is provided from two sources
 - ① from water of crystallization of citric acid
 - ② The water produced from the reaction of citric acid & tartaric acid with sodium bicarbonate.
- ④ The powdered ingredients are passed through sieve number 60, weighed and mixed.
- ⑤ They are packed in dry, wide mouth, Air tight containers

Formulae for preparation of Citric-tartrate Effervescent granule.

Sodium bicarbonate powder - 20g

Tartaric acid powder - 10g

Citric acid powder - 7g

Refined sugar powder - 6g

② wet method.

- ① The mixed ingredients are moistened with suitable liquid.
- ② Alcohol is added in small portion with continuous stirring until a coherent mass is formed
- ③ The mass is then passed through sieve no. 60 and the granules dried at a temperature not exceeding 60°C .
- ④ The dried granules are again passed through the sieve to break the lumps which may have

formed during drying.

⑤ They are packed in dry, wide mouthed, Air tight containers.

Explosive

⑨ preparation and dispensing of ~~esthetic~~ powders

① when an oxidising agents and reducing agents are triturated in a mortar there are chances of explosion which may lead to serious consequences

② powder each ingredient separately in a mortar and mix them lightly with other ingredient

OR

③^{OR} powder each substance separately and dispense them in separate paper with suitable directions to the patient regarding its use.

Rx

Potassium Chlorate 600 mg

Tannic acid 300 mg

Sucrose 300 mg

Make powder and send such three.

⑩ Explain the formulations of Tooth powder

Ans: ① Tooth powder contains detergent, some abrasive substance and a suitable flavour

② The abrasive agents such as calcium carbonate, calcium sulphate are used in fine powder

Rx

Hand Soap 50 g

calcium carbonate 900 g

Saccharin Sodium 2 g

Peppermint oil 2 ml

Cinnamon oil 4 ml

Methyl Salicylate 8 ml

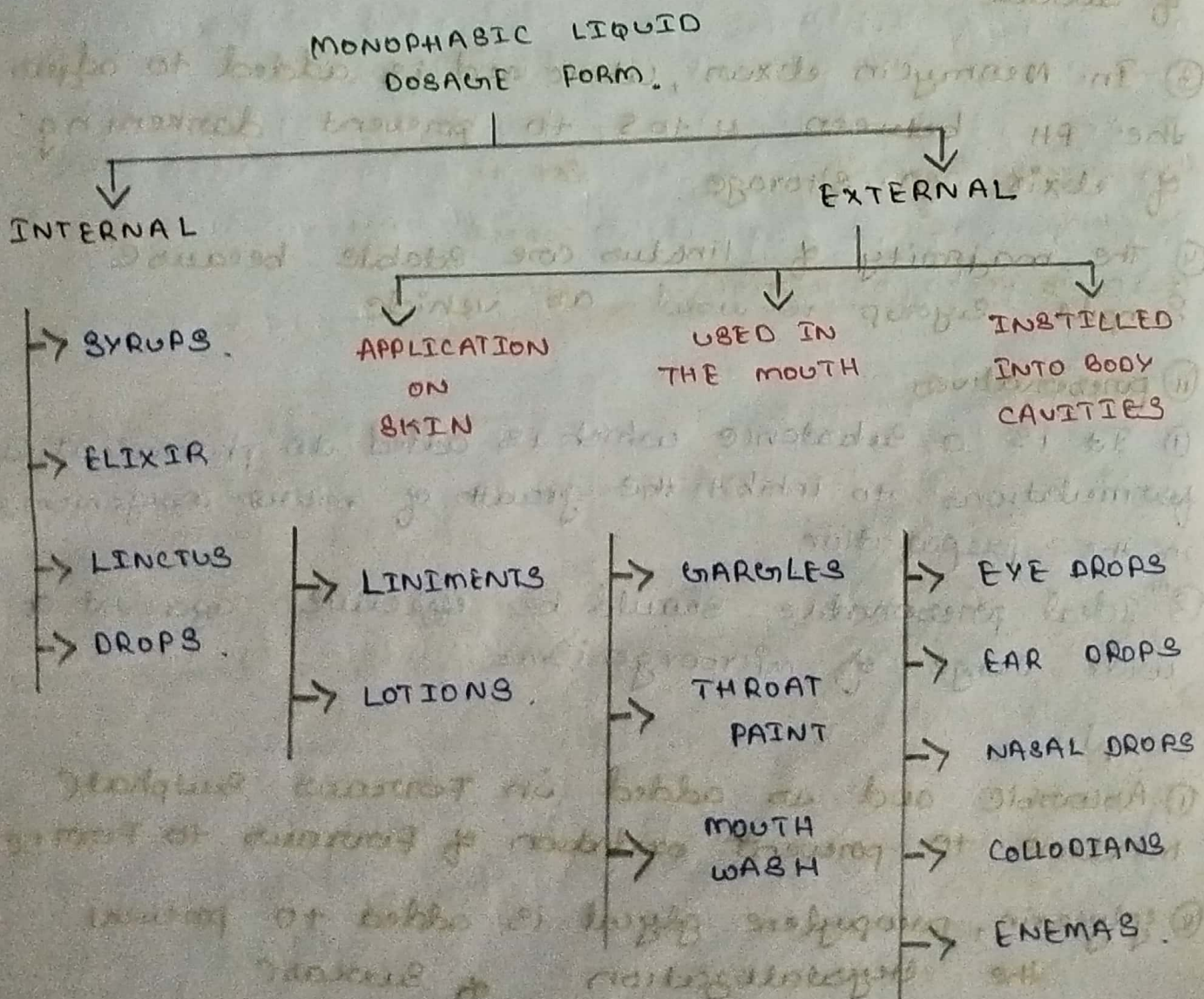
Make a tooth powder

method

- ① Triturate Saccharin Sodium, oil, methyl salicylate with half of calcium carbonate.
- ② mix the soap with remaining portion of calcium carbonate
- ③ Mix the two powders thoroughly and pass it through a fine sieve
- ④ They are packed in dry, Air tight containers

51

⑪ Define and classify monophasic liquid dosage form
 Ans: It refers to liquid preparations in which there is only one phase. It is represented by true solution.



12) Explain the theoretical aspects of formulations including adjuvant like stabilizers, colourants, flavours with example in monophasic liquid dosage form.

52

(i) Stabilizers

- ① Stability of pharmaceutical product may be defined as the capability of a particular formulation in a specific container to remain within the physical, chemical and therapeutic specifications.
 - ② The substance which are used to control these stabilizers are known as stabilizers.
- Important stabilizers are antioxidants & preservatives.

(i) Antioxidants.

- ① It is a substance which is added to pharmaceutical formulation to prevent oxidative degradation of the drug.
- ② An Ideal Antioxidant should be stable and effective against a wide range of pH, colourless, non-toxic and compatible with formulation ingredients & packaging materials.

(ii) preservatives

- ① It is a substance which is added to pharmaceutical formulations to inhibit the growth of micro-organisms in the preparation.
- ② An Ideal preservative should be effective against a wide range of microorganisms.

Examples

- ① Ascorbic acid is added in Ferrous Sulphate mixture to prevent oxidation of Ferrous to Ferric.
- ② Glycerin, propylene glycol is added to prevent the crystallization of sucrose.
- ③ The majority of linctuses are stable because Simple Syrup is used as a vehicle.

② Colours

① It is a substance used to impart colour to foods, drugs and cosmetics to increase their organoleptic properties.

② Colours may be obtained from minerals, plants and animals or they can be prepared by synthesis.

Example:

① Cochineal dye is used as colouring agent in Elixirs & amaranth.

③ Flavouring Agents

① It is a substance which are used to impart pleasant smell to the preparation and to mask specific type of taste of the preparation. Thus make them more palatable.

Example:

① Raspberry Syrup, Lemon Syrup and orange Syrup are used as Flavouring agents.

⑬ Difference b/w Syrups and Elixirs

SYRUP	ELIXIR
① Syrups are conc. aq. prep of sugar	① Elixirs are clear, Sweetened, Hydroalcoholic prep.
② More Sweet than Elixir	② Less Sweet than Syrup.
③ More Viscous than Elixir	③ Less Viscous than Syrup.
④ More Effective than Elixir	④ Less Effective than Syrup
⑤ From a manufacturers point of view Syrups are not preferred over Elixirs	⑤ & Elixirs are preferred over Syrup

14) Differentiate b/w Liniments & Lotion

54

LINIMENTS

LOTION

- ① It is a liquid or semi-solid preparation
- ② Applied to the skin with friction
- ③ Liniments are more viscous than Lotion
- ④ Liniments should not be applied to the broken skin
- ⑤ It is used for analgesic and counterirritant properties.

- ① It is a liquid preparation
- ② Applied to the skin without friction
- ③ Lotions are less viscous than Liniments
- ④ It will not cause much irritation on applying on broken skin
- ⑤ It is used for protective purposes

15) Differentiate b/w dusting powder & tooth powder

DUSTING POWDER

TOOTH POWDER

- ① It is meant for application to the skin
- ② It is used for antiseptic and antipruritic purposes
- ③ It doesn't contain flavours and soap
- ④ It is passed through sieve no. 120
- ⑤ It is applied with powder puff

- ① It is meant for application to the teeth
- ② It is used to clean the surface of the teeth
- ③ It contains flavours and soap
- ④ It is passed through sieve no. 85
- ⑤ It is used with the help of toothbrush

16) Explain the preparation of insufflation with example

- ① These are the finely divided powders meant for introduction into the body cavities such as ears, nose, tooth sockets and vagina with the help of an apparatus known as Insufflator.
- ② Insufflator divides the powder into a stream of finely divided particles to the site of application.
- ③ The major difficulty in using this apparatus is that:
 - ① It is difficult to obtain measured quantity.
 - ② chances of getting block.
- ④ pressure aerosols have eliminated above difficulties measured quantity of dose can be obtained with this method.
- ⑤ In Insufflations the particle size must be very small and they should be absolutely free from irritant and sensitizing effects.

16) Explain the Evaluation method of Suspension.

- ① Sedimentation method.
- ② The measurement of Sedimentation volume is the most important parameter in the evaluation of the stability of Suspension.
- ③ It is determined by keeping measured volume of the Suspension in a graduated cylinder in an undisturbed position for a definite period of time.
- ④ Note down the ultimate height of the sediment and initial height of total Suspension.
- ⑤ The Sedimentation volume is the ratio of the ultimate height and the initial height.

(v) The Sedimentation volume can be plotted against time

(vi) A stable suspension shows a horizontal curve

(2) Micromeritic method

(i) The stability of a suspension depends on the particle size of the dispersed phase

(ii) The size of the particle in a suspension may grow and ultimately leads to formation of lumps

(iii) Any change in particle size with reference to time will provide useful information regarding the stability of a suspension

(3) Rheological method

(i) The viscosity of the suspension is studied at different time intervals by using a good quality of viscometer

(ii) It provides useful information about the stability of suspension.

(4) Electrokinetic method

(i) The determination of zeta potential of suspension is helpful to find out the stability of suspension

(ii) Certain zeta potentials produce more stable suspension because of controlled flocculation

(17) Explain Evaluation method of Emulsion with

(i) globule size

(i) Increase in the globule size after the preparation of the emulsion indicates physical instability of the emulsion

(ii) Electronic devices can be used to measure the globule size of the emulsion.

② FLOW PROPERTIES

- ① Determination of flow property of an emulsion can serve as an index of its stability.
- ② viscometer is used to detect the creeping tendency of the emulsion.

57

③ Effect of thermal stresses

- ① Expose the emulsion to 60°C for few hours and then to 0 to 40°C and evaluate it for the stability.

④ phase Separation

- ① The rate and degree of phase separation in an emulsion can be studied by keeping a specified amount in a graduated cylinder.
- ② Then measure the volume of separated phase after definite time intervals.
- ③ The phase separation may result from creeping of the emulsion.

⑤ Define Incompatibility, classify and Explain each type of Incompatibility and Explain how to overcome with examples

Ans: pharmaceutical Incompatibility may be defined as the result of prescribing the substances which are antagonistic in nature and an undesirable product is formed which may affect the safety, purpose or appearance of the preparation.

Types

- ① Physical Incompatibility.
- ② Chemical Incompatibility.
- ③ Therapeutic Incompatibility.

① physical Incompatibility.

① physical Incompatibility is usually due to immiscibility, insolubility and precipitate formation. Solid materials.

② This usually causes non-uniform and unpalatable mixtures.

③ These difficulties can be easily overcome by applying the pharmaceutical skill.

④ physical Incompatibility can be corrected by following methods.

① change in order of mixing.

② Emulsification.

③ Addition of suspending agent etc.

Examples

① Immiscibility.

oil and water are immiscible with each other. It can be made miscible with water by Emulsification.

Rx

Castor oil

15 ml

water upto

60 ml

make an emulsion.

In this prescription castor oil is immiscible with water. To overcome this incompatibility an emulsifying agent is used to make a good emulsion.

② Liquefaction.

- ① when two or more substances are mixed together they liquefy due to the formation of a new compound which has a lower melting point than room temp
- ② The formation of eutectic mixtures signifies physical change rather than chemical change.
- ③ The substance which on mixing liquefy are menthol, phenol, camphor etc. 59
- ④ In dealing with eutectic substance forcibly they may be dispensed as separate set of powders with direction "one set of each kind shall be taken as a dose"
- ⑤ Secondly they may be incorporated in powders by adding an inert absorbent like kaolin, bentonite etc
- ⑥ Generally an equal amount of absorbent as that of eutectic substance is sufficient to prevent liquefaction.
- ⑦ when the substance which liquefy are present in small amount, they may be mixed together so as to form a eutectic mixture, then the liquid so formed is absorbed by adding an absorbent. The remaining ingredients of the prescription are then incorporated and mixed together
- ⑧ An individual medicine is powdered separately and mixed with an absorbent and then combined together lightly and filled in suitable containers

R_x

menthol	5g
camphor	5g
Ammonium chloride	30g
Light Magnesium carbonate	60g

60

Make an insufflation

② chemical Incompatibility

① chemical Incompatibility may be result of chemical interactions b/w ingredients of a prescription to yield toxic or harmful product

② chemical Incompatibilities result from oxidation, reduction, acid-base hydrolysis etc.

③ It can be noticed by precipitation, effervescence, decomposition, colour change

precipitate yielding interactions

① Reaction b/w strong solution proceeds at a faster rate and precipitate formed are thick & indiffusible

② Reaction b/w dilute solution proceeds at a slower rate and precipitate formed are light & diffusible

The method A & B is followed in dispensing the prescription yielding diffusible and indiffusible precipitates.

Method A.

① This method is used when diffusible ppt are formed

② Divide the vehicle into two equal portions

③ Dissolve one of the reacting substance in one portion and the other in the other portion

④ Mix two portion slowly with rapid stirring.

Method B.

(i) This method is used when Indiffusible ppt is formed

(ii) Divide the vehicle into two portion

(iii) Dissolve one of the reacting substance in one portion and the other in the tragacanth mucilage

(iv) Mix two portion slowly with rapid stirring.

Examples.

① Soluble Salicylates Incompatibilities

R_x

Ferric chloride solution 2ml

Sodium Salicylate 2g

Water up to 90ml

Make a mixture

(i) Ferric chloride reacts with Sodium Salicylate to form ferric Salicylate, the precipitate of which are indiffusible in nature.

(ii) Hence follow Method B for precipitate-yielding combination.

② Soluble Iodides Incompatibility.

R_x

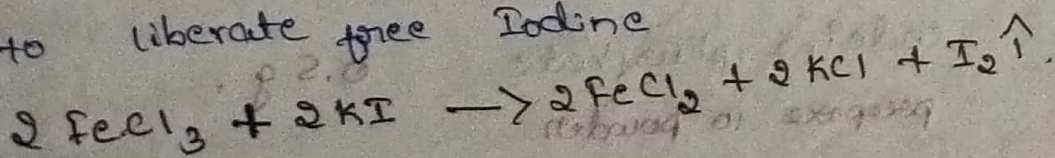
Ferric chloride solution 1.5ml

Potassium Iodide 2g

Potassium citrate 6g

Water up to 90ml.

(i) Ferric chloride solution reacts with potassium Iodide to liberate free Iodine



to prevent the liberation of Iodine, Ferric chloride is converted into colloidal oxygenic compound, before the addition of potassium Iodide.

- (i) Dissolve potassium citrate in about $\frac{1}{4}$ th of water
- (ii) Add ferric chloride solution and then potassium Iodide
- (iii) Add more water to adjust final volume
- (iv) The colour of the mixture will be green due to the formation of new compound by the reaction b/w Ferric chloride and potassium citrate

③ Therapeutic Incompatibility.

(i) Therapeutic Incompatibility may be as a result of prescribing certain drugs to a patient with the intention to produce a specific degree of pharmacological action, but the intensity of the action is different

(ii) This occurs due to

- (i) Error in dosage
- (ii) wrong ^{drug} ~~dosage~~ or dosage form
- (iii) Synergistic and antagonistic drugs
- (iv) Drug interactions
- (v) contraindicated drugs

① Error in dosage

(i) The most serious type of dosage error is dispensing of overdose.

(ii) It becomes the duty of a pharmacist to check the prescription before dispensing it

Example

Rx

codeine phosphate

0.5 g.

prepare 10 powder

- ① This is an example of an over dosage. The intention of the physician may be to prescribe 5 mg and yet prescribed 500 mg.
- ② So prescription may be referred back to prescriber.

② wrong drug or dosage form.

- ① There are certain drugs which have quite similar names and there is always a danger of dispensing wrong drug.

For eg: digoxin and digitoxin.

- ② many drugs are available in different dosage forms, if the dosage form is not clearly mentioned, it becomes necessary to seek clarification from the prescriber.

③ Synergistic and antagonistic drugs

- ① when two or more drugs are used in the combined form their action is either increased or decreased, depending on the drugs used in combination, the phenomenon is called synergism.

- ② when the action of one drug is opposed by the other drug, the phenomenon is known as antagonism. The total combined effect is less than the algebraic total effect of two drugs.

Rx

Acetyl Salicylic acid

0.6 g

probenecid

0.5 g

Acetyl Salicylic acid and probenecid are used in the treatment of gout. However combination of these leads to neutralisation. So refer back the prescription to the prescriber for necessary correction.

④ Drug Interactions

- ① The effect of one drug is altered by the simultaneous administration of another drug is known as drug interaction.
- ② The drug interaction is usually corrected by proper adjustment of dosage.

Ex

Rx

Tetracycline hydrochloride

250 mg

Send 10 capsules

Direction: Take one capsule every six hours with milk

- ① Tetracycline is inactivated by calcium which is present in milk, so tetracycline capsule should not be taken with milk.
- ② In the prescription therapeutic incompatibility is unintentional, so the prescription may be reformed back to the physician to change the direction.
- ③ Contra-indicated drugs
- ① There are certain drugs which may be contra-indicated in a particular disease and in a particular patient who is allergic to it.
- ② Corticosteroids are contra-indicated in a patient having an active peptic ulcer.
- ③ penicillin and Sulpha-drugs are contra-indicated to the patient who are allergic to it.
- ④ Barbiturates and morphine should not be given to asthmatic patients.

Ex. Rx

Sulphadiazine

250 mg

Sulphonamide

250 mg

Ammonium chloride

500 mg

65

Ammonium chloride is a urinary acidifier. It would cause deposition of Sulphonamide in crystal form in the kidney. Hence the prescription should be referred back to the prescriber.

(19) What are the ways to protect drug from oxidation?

(i) Two reacting substances are dispensed separately and patient may be directed to mix the two solution before use.

(ii) prevent exposure to light

(iii) By using Antioxidants

(iv) we can prevent oxidation by using buffers

(v) By storing drugs in oxygen free environment

(vi) By storing at low temperature

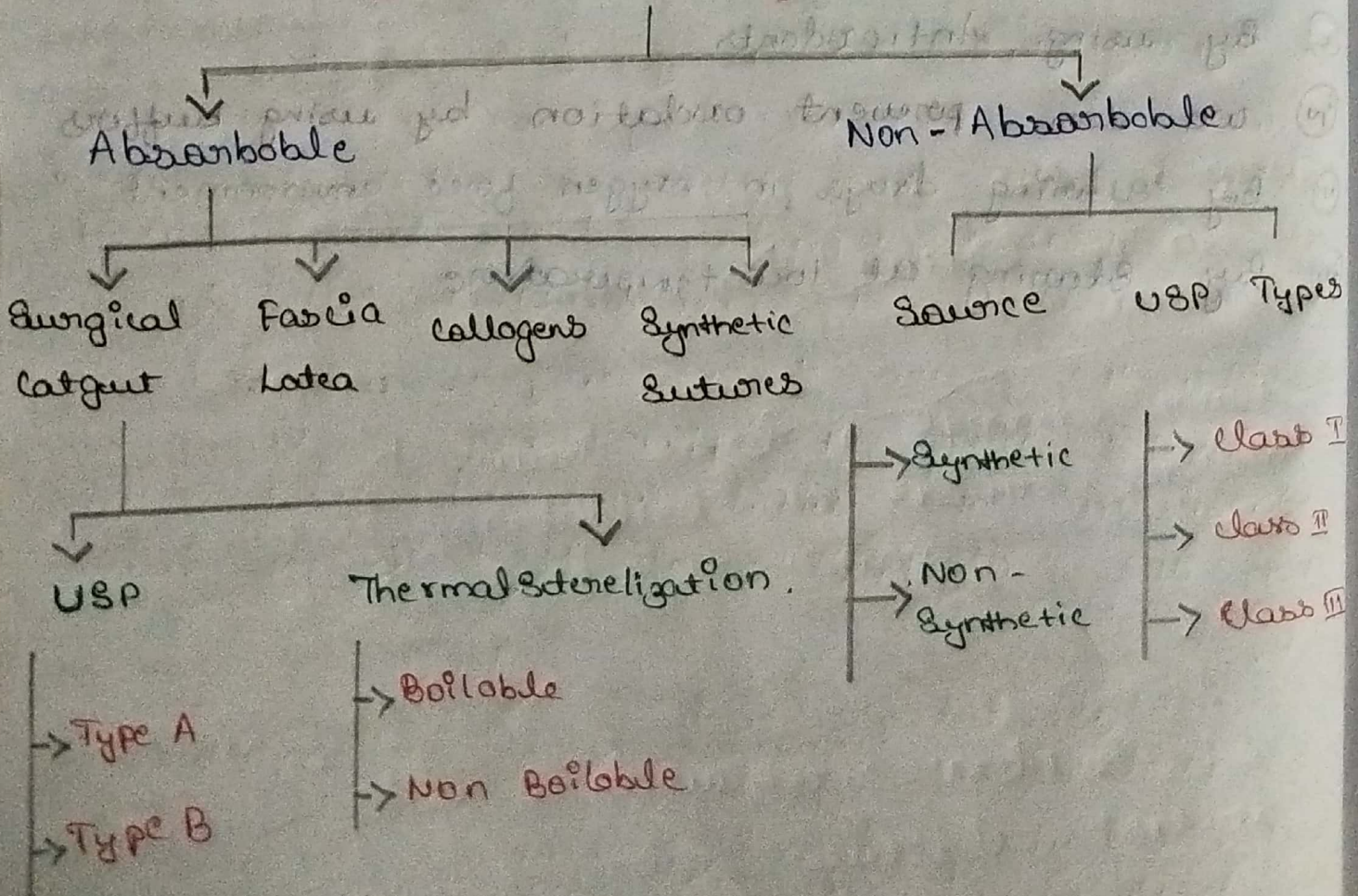
(vii) By storing

Q. Define & classify various Surgical Sutures and ligatures ? Give their ideal characteristics ? Explain catgut preparation.

Ans:

- ① Surgical Sutures and ligatures are flexible strands of fibres specially prepared and sterilized for use in surgery.
- ② Ligatures are used to stop bleeding by tying off the blood vessels.
- ③ Sutures are used for sewing the tissues together with needles.
- ④ These are classified as Absorbable and Non-Absorbable.

Sutures and Ligatures



Ideal characteristics

- ① It should be soft efficient
- ② Not allergenic, non carcinogenic
- ③ Easy to handle
- ④ Minimally reactive to tissue
- ⑤ Should have uniform diameter
- ⑥ Should have adequate tensile strength

Catgut preparation

- ① Raw materials
- ① When the sheep are slaughtered the intestine are roughly cleaned of their contents and placed in cold storage
- ② Selection and washing
- ① About 5-7cm of the Intestine is selected for surgical gut preparation.
- ② Lasing is removed by soaking them in water
- ③ Splitting
- ① Splitting is carried out by inserting cutting tool into the end of lasing & pulled against two sharp knives
- ② Intestine splits into rough and smooth ribbon
- ③ Smooth ribbon is the one chosen for surgical gut.

④ Removal of unwanted layers
① gut consists of mucosa, muscle and serosa layer. It is scraped away mechanically by blunt knives

⑤ This process is aided by soaking in alkaline solution

⑥ orientation of fibres

① during above scraping process the fibres of the gut become arranged in more parallel way. This greatly increases tensile strength.

⑦ Hardening

① At this stage ribbons may be hardened by soaking in solution of chemical salts.

⑧ Spinning

① The ribbons are tied two ends in group of two, then they are pulled at an even tension.

② The no of twists used in spinning must be carefully controlled to ensure uniform product of good tensile strength.

⑨ Drying

① This is done in atmospheric condition by keeping string under suitable tension.

④ Finishing

- ① The dried strings are polished by mechanical means.
- ② This is a smoothing process, in which strings are rubbed against abrasive surface to produce smooth & uniform string of circular section.

⑤ Gauging.

- ① Here strings are carefully gauged to know whether the strings show uniformity of the same batch show uniformity and length of each string.

⑥ Sterilisation

- ① The gut may be sterilized by heat, chemical or ionizing radiation.

⑦ Chemical process Includes the use of Iodine

- ① Disadvantage of this process are
 - ① long period immersion in Iodine solution
 - ① Increase in absorption time in the body.

- ② chemical sterilization by using formaldehyde produces hard sutures which reduces tensile strength.

⑤ In thermal sterilization, dehydration of catgut is necessary before its thermal sterilization otherwise moisture causes hydrolysis of collagen into gelatin.

⑥ Heat processes, in spite of the problems involved, produces more satisfactory products.

⑦ In radiation sterilization catgut is packed in aluminium foil and exposed to gamma radiation.

Q1) Define surgical dressing & Explain the classification of surgical dressing.

Ans. ① A material used to protect a wound and to heal a wound is called as surgical dressing.

② Surgical dressing prevent infection, & gives physical protection and mechanical support.

classified as.

- ① primary wound dressing
- ② Absorbents.
- ③ Bandages.
- ④ Adhesive tapes.
- ⑤ protectives.

① primary wound dressing.

① They are applied over the wound to absorb pus, mucus, blood etc

② Some dressing adhere to the wound surface and cause pain on removing, now non-adherent dressing are available such as absorbent pad ~~forced~~ with soft plastic film having opening.

71

② Absorbents

① They are widely used to absorb wound excretions

② Gazeon, sponges, sanitary napkins, cotton balls are used in shape of balls or pads.

③ Bandages

① It is a material which hold dressing at the required site

② It supports injured part and check haemorrhage

③ Bandages may be elastic or non-elastic

④ Adhesive tapes

① Surgical Adhesive tapes may be rubber based adhesive or acrylate adhesive

② Rubber adhesive tapes are cheap, superior & provide strength.

③ acrylate adhesive are used to reduce skin trauma.

47

protectives.

- ① It is used to create moist Environment
moisture suppresses tissue dryness
- ② wax coated and plastic coated are
types of protectives.

2 mark important concepts

① Define Drug forms with example

Ans. It is a transformation of a pure chemical compound into a pre-determined form by mixing drug component with non-drug component.
 5 paracetamol → Available both in solid & liquid

② Define unit & Bulk drug form

① A pharmaceutical drug form that contains unit amount of drug is termed as unit drug form

10

② A pharmaceutical drug form where a portion is removed from its bulk as drug form.

③ Define solid, liquid, semi-solid drug form

①¹⁵ Solid drug form

① A substance having definite shape and volume manufactured for administration of active ^{and} ~~inert~~ ingredients.

②²⁰ A drug substance in the fluid state of matter having no fixed shape but have fixed volume.

③ Semi-solid drug forms are products of semi-solid applied to skin ~~or~~ mucous membrane for therapeutic ~~or~~ protective action.

25

④ Define Tablets with example

Ans It is a unit solid dosage form containing drug substances prepared by compressing powdered medicinal substances by molding methods, meant for oral administration
paracetamol tablets, Aspirin

⑤ Define Capsules with examples

It is a unit solid dosage form containing mixture of drugs enclosed in a water soluble 'shell of gelatin' meant for oral administration
Chloroquin

⑥ Define pills with examples

15 It is a unit solid dosage form containing medicinal agent, meant for oral administration generally spherical or oval shaped
phenolphthalein

⑦ Define drops with examples

Drops are liquid preparations where Vitamin A and D concentrates in fish-liver oil are presented as drops for oral administration.

⑧ Define Jellies with example

Ans. Jellies are Translucent Semi-Solid preparation meant for external application to the skin or mucous membrane used for lubrication and as contraceptive jellies

Ex: - proflavin Jellies

⑨ Define Creams with examples

Ans. Creams are Semi-Solid preparation. They have lighter body than ointments due to the presence of water soluble bases. They can easily removed from skin meant for application to the skin. Ex: - Centrimide creams

⑩ Define pastes with examples

Ans. pastes are Semi-Solid preparation contain large amount of finely powdered solids such as CaCO_3 , Starch etc. which provides protective coating meant for external application to the skin. Ex: - Coal tar paste

⑪ Define prescription

Ans. prescription is an order written by a registered medicinal practitioner to a pharmacist to compound and dispense a specific medication for the patient.

(12) what is the Importance of prescription

The prescription provides a common link of mutual interest b/w physician, pharmacist and the patient

(13) what is SuperScriptio?

SuperScriptio is represented by symbol Rx written at the beginning of prescription. According to mythology, it is prayer to Jupiter, But now understood as abbreviation of Latin word "Recipe" means "you take"

(14) Define Inscription with example

It is a part of a prescription which contains names and quantities of prescribed Ingredients

Ex: Potassium Bromide 8g
Tincture nomic 8 ml
chloroform water 120 ml

(15) Define Subscriptio with example

Ans The part of prescription contains prescriber's direction to the pharmacist regarding the dosage form to be prepared and no. of doses to be dispensed

Ex: Fiat Mistura

(16) Enumerate the steps in handling of prescription

- (1) Receiving
- (2) Reading and checking
- (3) Collecting and weighing the materials
- (4) Compounding
- (5) Finishing.

(17) Define Pharmacology

Ans¹⁰ It is a branch of medical science which deals with quantity of drugs which can be administered to produce the required pharmacological actions

(18) ¹⁵ Define doses or dosages
doses

It is the quantity of medicine given to the patient based on age, sex and body condition

²⁰

(19)

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(19) Tolerance ? Give Example

Ans when a drug administered in an ordinary dose fail to produce the normal therapeutic effect and require large dose of the drug to produce the normal effect. This unusual resistance thus produced is known as Tolerance.

Ex: Smokers can tolerate nicotine

Alcoholics can tolerate large doses of Alcohol

(20) Idiosyncrasy ? Give Example

The abnormal reaction of a patient towards drug is known as Idiosyncrasy.

Ex: 15 Small dose of quinine may produce ringing in the ear.

(21) Define Hypersensitivity with example

It is an allergic reaction to a drug. This is due to frequent use of drugs like antibiotics, vitamins and especially proteinous substances.

Ex: Skin rashes

(22) Define Synergism with examples

when two or more drugs are used in the combined form their action is either increased or decreased, when the duration of action is increased, the phenomenon is called Synergism.

Ex: combination of ephedrine and adrenaline.

(23) Define antagonism with example

10 When the action of one drug is opposed by the other drug, this phenomenon is known as antagonism.

Ex: milk of magnesia is given in acid poisoning.

15

(24) Name the drug which are not to be prescribed at the time of lactation?
 Antihistamines and morphine

(25) 20 Define Drugs?

It is a chemical substance which is used to diagnose and cure disease in animals.

① Define pharmacy

It is a profession concerned with Art and Science of Identification, Selection, preparation, preservation and Standardization of Suitable drug⁵ Substances and dispensing of these to achieve complete pharmaceutical care.

② Define galenical pharmacy?

The branch of pharmacy, which relates to the preparation of medicines by Infusion, decoction etc. as different from which are chemically prepared.

③ De materia Medica?

Ans It is a pharmacopoeia of herbs and the¹⁵ medicines that can be obtained from them.

* ④ Define pharmacist & write two roles

A person who is professionally qualified to prepare and dispense medicinal drugs.

20

(i) He works as clinical pharmacist +

(ii) Industrial pharmacist +

25

(5) what is ancient era in history of pharmacy?

Ans In 1600 AD, Early man used materials in his surroundings, ^{like} leaves, mud, coal, H_2O , herbs, cinnamon bark, etc to stop bleeding and heal wounds. Dry clay was used to join broken bone. This has become Ancient Era in history of pharmacy.

10

(6) what is Empirical Era in history of pharmacy?

Ans During (1600 - 1940), pharmacopias were used to protect public health,

(2) Root, bark, Herbs, flowers were used and controlled by the government.

(3) Created interest in testing of drugs and how they affected the body. This has become the Empirical Era in history of pharmacy.

20

(7) what is patient care era in history of pharmacy?

Ans New problems like allergic reactions, multiple ^{drug} reaction interaction with other drug and food. Increased the therapeutic duties of patient care in hospitals.

⑧ When the Bengal chemical and pharmaceuticals started and by whom?

Ans. In 1901, a small factory 'Bengal Chemicals and pharmaceutical works' was established in Calcutta by Acharya propulla chandra Roy.

⑨ What is bowl of Hygieia?

Ans. Bowl of Hygieia is one of the symbol of pharmacy. ^{Acc to mythology} Asclepius symbol god Asclepius and his daughter Hygieia were considered to be goddess of health. Asclepius symbol is his rod with a snake twisted around it. Hygieia's symbol is a cup with a snake twisted around its stem & poised above it.

⑩ Contribution of Galen in pharmacy?

① Galen influenced the development of various scientific discipline, including Anatomy pathology etc.

② He developed a system of Galenic degrees which enabled the physician to

gauge the effect of medicinal substances

⑪ what are the various level at which pharmacy education is imparted in India?

① diploma in pharmacy (12th science + 2 years) - A community pharmacy oriented diploma programme

② B-pharm (12th science + 4 years) - It is a pharmaceutical technology & industry oriented undergraduate course

③ M-pharm (B-pharm + 2 years) - pharmaceutical science and pharmacy practice

④ pharm - D (12th science + 6 years) - It is a patient oriented post graduate programme

⑫ contribution of Arabs in development of pharmacy

① The translation schools established to translate the books

② Discovery of new drugs

③ They made pharmacy as a separate profession

④ pharmaceutical Literature Development

⑫ write any two objectives of RN Chopra committee?

5

① Drug Act 1940, The main objective of this act was to regulate the import, manufacture, distribution and sale of drugs and cosmetics in India.

10

② Pharmacy Act 1948, The main objective of this act was to regulate the profession of pharmacy in India.

③ 15 Drug and Magic Remedies Act 1954, passed with the main aim to control certain types of advertisements related to drug and to prohibit certain types of advertisements related to magic remedies.

20

⑭ what is meant by apothecary shop?

Ans They sell ingredients and the medicines they prepared wholesale to other medical practitioners, as well as dispensing them to patients.

(15) what is meant by papyrus rolls?

Ans. preserved medical documents from ancient Egypt. It is a collection of different medical texts that offer the most complete record of medicine.

(16) write any two objectives of central drug laboratory

(1) To ensure accurate testing facility

(2) To update technical knowledge

(3) To provide proper and safe working environment to adopt good laboratory practice

* ① what is pharmacopoeia & mention all the editions of Indian pharmacopoeia.

Ans It is an official publication containing a list of medicinal drugs with their effects and direction for their use.

various editions of IP

① 1st edition IP, 1955, Dr. BN GHOSH, chairman
10 Supplement 1960

② 2nd edition IP, 1966, Dr. Mukherji, chairman
Supplement 1975

③ 15 3rd edition IP, 1985, Dr. Nithyanand, chairman
I Addendum 1989
II Addendum 1991

④ 20 4th edition IP, 1996, Dr. Nithyanand, chairman
Addendum 2000
Addendum 2002

⑤ 5th edition IP, 2007, Dr. Nithyanand, chairman

⑥ 25 6th edition IP, 2010, Dr. Nithyanand, co-chairman
Addendum 2012

⑦ 7th edition IP 2014, Dr. B Suresh, Co-chairman
Addendum 2015

② Explain salient features of 1st edition of IP?

- ① The title of monographs have been given in Latin language.
- ② The weights and measures have been given in metric system.
- ③ Doses are expressed both in metric system as well as in English system.
- ④ A list of preparations has been given at the end of some of the monographs.

③ Explain salient features of 2nd edition of IP?

- ① The words of title transposed to name of the drug.
- ② Preparation is given immediately after monograph.
- ③ Test for sterility is modified to detection of fungi.
- ④ Solubility is expressed in parts of solvent per unit part of solute.

④ Explain Salient features of 3rd edition of IP

① 260 new monographs have been added

② 450 monographs were deleted

③ Addendum 1 was ^{PU} established in 1989
46 new monographs added and 126 amended

④ Addendum 2 was published in 1991
62 new monographs added and 110 amended

★ ⑤ Explain Salient features of fourth
10 edition of IP?

① It has been made effective from 1st Dec 1996

② It covered 1149 monograph & 123 appendices

③ Addendum 1 has been made effective from 2000
42 new monographs have been added

④¹⁵ Addendum 2 has been made effective from 2003
19 new monographs have been added

⑥ Give the Significance of pharmacopoeias

① It provides quality control methods

②²⁰ It gives idea about sources
tests, uses, dosage & Storage condition

③ It comprises of list of pharmaceutical
substances, formulae along with
their description & standard

⑦ Enlist various pharmacopoeias.

- ① Indian pharmacopoeia (IP)
- ② United States pharmacopoeia (USP)
- ③ European pharmacopoeia (EP)
- ④ British pharmacopoeia (BP)
- ⑤ International pharmacopoeia (IP)

⑧ Write any two objectives of International pharmacopoeia.

- ① To develop, establish, and promote International Standards for pharmaceutical products
- ② It aims to achieve a wide global harmonisation of quality specification for selected pharmaceutical products.

⑨ Mention the contents of National Formulary of India

- ① It aims to promote rational drug use
- ② It acts as guidelines for physician and pharmacist
- ③ It elaborate principles of prescription writing, drug interaction, dose etc.
- ④ It explains Indication, precautions, adverse effects and storage

(16) which is the latest edition and year of publication of Indian pharmacopoeia

(1) latest edition :- 7th edition of IP 2014

(2) 5 years of publication

1st edition of IP - 1955

7th edition of IP - 2014

(11) what is Extra pharmacopoeia?

Ans¹⁰ published by pharmaceutical Society

(1) of Great Britain, contains the

Information of drugs presently used

in Great Britain which is

entirely revised & reset

Weights and measures

① prepare 4 fl oz of 5% solution of a substance

sol 5 25 gm dissolved in 8 fl. oz = 1% $\frac{w}{v}$ sol

25 x 5 gm dissolved in 8 fl. oz = 5% $\frac{w}{v}$ sol

$\frac{25 \times 5}{8}$ gm dissolved in ~~one~~ 8 fl. oz = 5% $\frac{w}{v}$ sol

$\frac{25 \times 5 \times 4}{8} = 87.5$ gm dissolved in 4 fl. oz =

5% $\frac{w}{v}$ sol

Therefore weight 87.5 gm of the substance and dissolve in sufficient amount of water to produce 4 fl oz. The resulting solution will be 5%.

$$\frac{1}{500} \times 100 = \frac{100}{500} = 0.2\%$$

Page No.:

Date:



20 fl.oz

"

↑

② Send 1 pint of a 1 in 500 solution of KMnO_4

So 1 35 gr dissolved in 8 fl.oz = 1% $\frac{35}{8}$ sol

5 35 x 0.2 gr dissolved in 8 fl.oz = 0.2% $\frac{35}{8}$ sol

$\frac{35 \times 0.2}{8}$ gr dissolved in 1 fl.oz = 0.2% $\frac{35}{8}$ sol

10 $\frac{35 \times 0.2 \times 20}{8} = 17.5$ gr of KMnO_4 dissolved in 20 fl.oz

= 0.2% $\frac{35}{8}$ sol

15 Therefore, weigh 17.5 gr of KMnO_4 and dissolve in sufficient amount of water to produce 1 pint. The resulting solution will be 1 in 500 solution

20

③ Calculate the quantity of NaCl required to prepare 500 ml of 2% solution

sol 1 g of NaCl in 100 ml H_2O = 1% $\frac{1}{100}$ solution

5

2 g of NaCl in 100 ml H_2O = 2% $\frac{2}{100}$ solution

2 g $\rightarrow$ 100 ml of 2% sol.

? $\rightarrow$ 500 ml 2% sol.

10

$$= \frac{2 \times 500}{100} = 10 \text{ g}$$

15

Dissolve 10 g of NaCl in sufficient H_2O to produce 500 ml. The resulting solution will be 2%.

20

25

ALCOHOL DILUTION

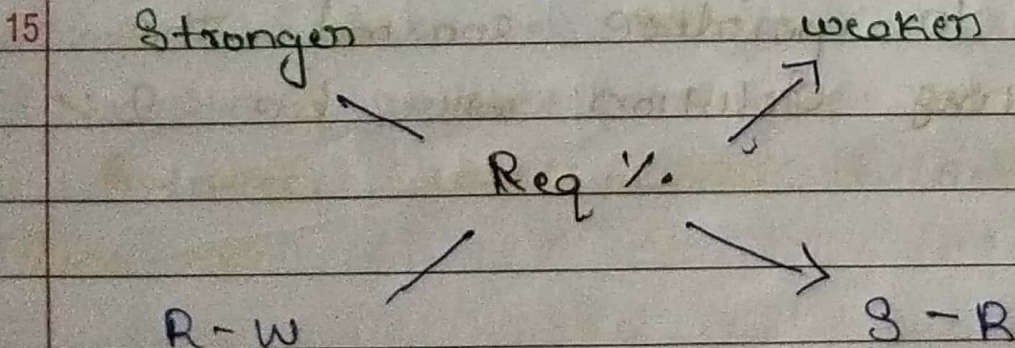
Q4) prepare 600 ml of 60% alcohol from 95% alcohol.

Q. 5. Sol. vol of 95% alcohol to be used $= \frac{600 \times 60}{95}$

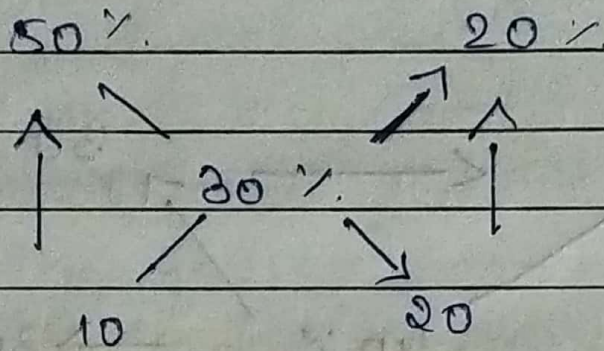
17 379 ml

Therefore take 379 ml of 95% alcohol, dilute it upto 600 ml with water, The resulting dilution will contain 60% alcohol.

Alligation method



① prepare 30% of 500 ml of alcohol from 50% & 20% alcohol



10 parts of - 50% alcohol

20 parts of - 20% alcohol

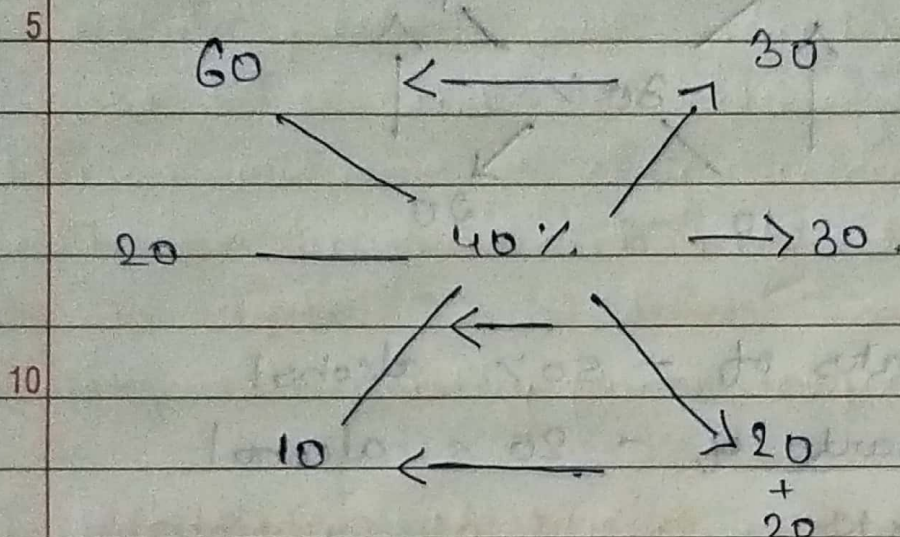
30 parts

$$50\% = \frac{500 \times 10}{30} = 166.6$$

$$20\% = \frac{500 \times 20}{30} = 333.3$$

500 ml

- ② prepare 300 ml of 40% alcohol from 10%, 20%, 60% alcohol



40 parts of — 10% alcohol
 30 parts of — 20% alcohol
30 parts of — 60% alcohol
 100 parts

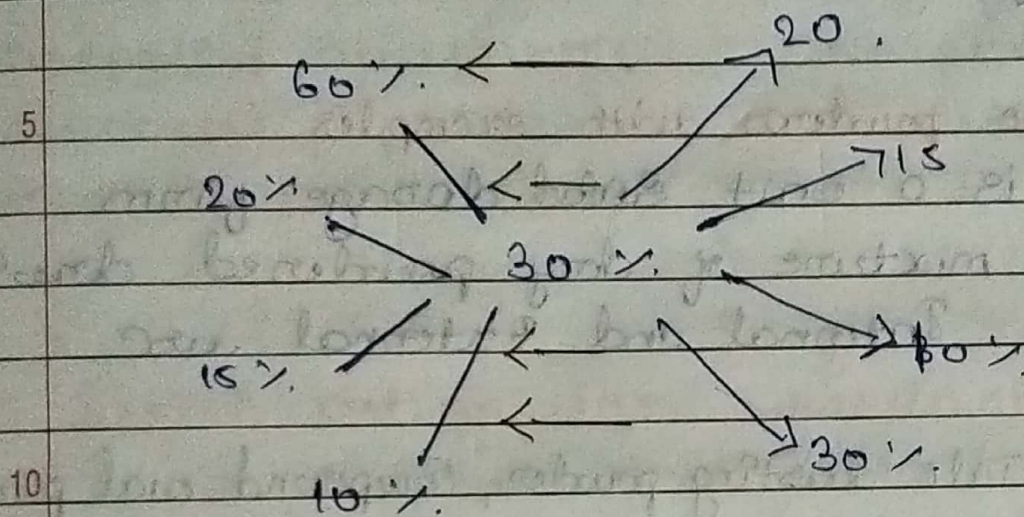
$$10\% = \frac{300 \times 40}{100} = 90 \text{ ml}$$

$$20\% = \frac{300 \times 30}{100} = 90 \text{ ml}$$

$$60\% = \frac{300 \times 20}{100} = 60 \text{ ml}$$

300 ml

③ prepare 400 ml of 30% alcohol from 10%, 15%, 20%, 60%.



90 parts of — 60% alcohol
 15 parts of — 20% alcohol
 10 parts of — 15% alcohol
 30 parts of — 10% alcohol
 75 parts

$$60\% = \frac{400 \times 20}{75} =$$

$$20\% = \frac{400 \times 15}{100} =$$

$$15\% = \frac{400 \times 10}{100} =$$

$$10\% = \frac{400 \times 30}{100} =$$

① Define ~~powders~~ with ~~examples~~

Ans A pharmaceutical powder is a mixture of finely divided ~~of~~

① 5 Define ~~powders~~ with ~~examples~~

Ans It is a unit solid dosage form containing mixture of dry powdered drug meant for Internal and External use

10 Ex: Talc dusting powder, compound oral powder

② Define ~~Intranasal~~ ~~injections~~ with ~~examples~~

Ans. These are the finely divided powders meant for Introduction into the body cavities such as ear, nose, tooth, sockets and vagina with the help of an apparatus known as ~~Intranasal~~ ~~injection~~ ~~apparatus~~.

③ 20 SNUFFS

Snuffs are finely divided solid dosage form of medicament which are inhaled into the nostrils for their antiseptic action.

(4) Dusting powder with examples

Ans It is a solid dosage form meant for external application to the skin for antiseptic, antipruritic, antiperspirant, absorbent, protective and lubricant purpose.

Ex: Salicylic acid dusting powder

(5) Define deliquescent substance with Ex

Ans It is a substance which absorb moisture to a greater extent and turn to solution are called deliquescent substance.

Ex: Sodium Bromide

15

(6) Define hygroscopic powder with Ex

Ans It is a powder which absorb moisture from the atmosphere are called hygroscopic powders.

20

Ex: Sodium Iodide

① Define monophasic liquid dosage form

Ans. MLOF are clean, homogeneous mixtures prepared by dissolving solid, liquid or gas in an another liquid.

5

Ex: LINTMENTS, LOTIONS

② Name any four antioxidants & preservatives used in Monophasic liquid dosage forms

10

① Antioxidants

(a) Ascorbic acid

(b) Sodium metabisulphate

(c) Citric acid

(d) disodium edetate

② preservatives

(a) glycerin

(b) propylene glycol

(c) Simple Syrup

(d) Alcohol.

③ Define gargles with Examples

Ans^① Gargles are liquid preparation used for the treatment of throat infections.

② They are brought into intimate contact with the mucous membrane of the throat and allowed to remain there for few moments after which they are thrown out of the mouth.

Ex: Aspirin gargles

10

④ Define Mouthwash with Examples

Ans: Mouth wash are liquid preparation usually aqueous solution in concentrated form with a pleasant taste and pleasant used¹⁵ for rinsing, deodorant and antiseptic action.

Ex: phenol gargle

bcl gargle

⑤ Define Throat paints with Examples

Ans²⁰ Throat paints are liquid substances preparation used for mouth and Throat Infection.

Glycerin is commonly used as a base because of its sweet nature and agreeable taste.

Ex: Mandel's paint
Glycerin

25

Q6 write the formula for Mandle's Throat paints

Ans	potassium Iodide	25 g
	Iodine	12.5 g
5	Alcohol (90%)	40 ml
	water	25 ml
	peppermint oil	4 ml
	glycerin to produce	1000 ml

Q7 10 direction for application of Throat paints

- ① Apply with camel brush
- ② Not to be swallowed in large quantities

Q8 15 direction for application of gargle

- ① Should be diluted before use
- ② Not to be swallowed in large quantities

Q9 Auxiliary label for gargles & liniments

① 20 gargles

- ① should be diluted before use
- ② Not to be swallowed in large quantities

liniments

① 25 Should not be applied to the broken skin

- ② Applied with friction

Lotion

- (1) Applied to the skin without friction
- (2) Shake well before use

(10) Define Ear drops with ex

Ans Ear drops are aqueous solution for installation into the ear. They are used for mild infection, softening wax, cleansing purpose.

Ex: phenol Ear drops

H_2O_2 Eardrops

10

(11) Define nasal drops with ex

Ans nasal drops are aqueous solution for installation into nostrils. They are commonly used for their Anti-inflammatory, Anti-bacterial, Antihistamine.

Ex: ephedrine nasal drops.

(12) Define Liniments with ex

Ans. Liniments are liquid preparation meant for external application to the skin applied by rubbing should not be applied to the broken skin

Ex: Boop liniment
white liniment.

25

(13) Explain Lotions with Examples

Ans: Lotions are liquid preparation meant for external application to the skin without friction.

They usually contain Alcohol & glycerin because alcohol produces cooling sensation where as glycerin keeps skin moist.

Ex: Calamine lotion

Salicylic acid lotion

(14) Colloids

Colloids are liquid preparation meant for external application to the skin. They are convenient application for small cuts. They are also used when prolonged contact with skin & medicament is required.

Ex: Salocin paint

(15) Enemas with examples

Ans: It is a liquid that is placed into the rectum to relieve constipation.

Ex: Pormaldehyde Enema

Loop Enema