

Index

Sr. No	Name of the Experiment	Page No	Date of Experiment	Date of Submission	Remarks
01.	Introduction to pharmacology.	01	12.09.14	22.10.15	
02.	Drug Dosage calculation	15	5.11.14	22.10.15	
03.	Drug Regulatory act and schedule Drugs	25 - 33	20.11.14	22.10.15	
04.	Prescription writing	33	04/12/14	22.10.15	
05.	Crude drugs	41	11/12/14	22.10.15	
06.	Dosage form	45	08/01/15	22.10.15	
07.	Seidlitz powder	55	15/01/15	22.10.15	
08.	oral Rehydration salt	58	21/01/15	22.10.15	
09.	Liquid dosage forms.	63	21/01/15	22.10.15	
10.	Castor oil emulsion	71	03/02/15	22.10.15	
11.	instruments used in pharmacy	75 -79	24/02/15	22.10.15	A
12.	Turpentine Liniment	79	03/02/15	22.10.15	
13.	Topical dosage form	85	02/03/15	22.10.15	
14.	Potassium Permanganate lotion.	93	15/03/15	22.10.15	
15.	Mandil's throat paint	99	07/04/15	22.10.15	
16.	Tincture iodine	105	21/04/15	22.10.15	
17.	Boroglycerine paint	111	28/04/15	22.10.15	
18.	Whitfield's ointment	121	09/06/15	22.10.15	
19.	sulphur ointment	125	23/06/15	22.10.15	
20.	Parental doses	129	01/07/15	23.04.15	B ^{plus}

Introduction to pharmacology

Pharmacology : pharmacos - drug
Logos - Study

It deals with interaction of exogenously administered chemical molecules (drug) with living system.

Drug: (French - Drogue - a dry herb)

A drug is any substance used for the purpose of diagnosis, prevention, treatment or cure of a disease.

WHO (1996)

"A drug is any sub. or product i.e. used or is intended to be used to modify or explore physiological systems or pathological states for the benefit of the recipient."

Pharmacy:

It is the art & science of compounding & dispensing drugs or preparing suitable forms for administration of drugs to man or animals.

It includes collection, identification, purification, isolation, synthesis, standardisation & quality control of medical substances.

Branches of pharmacy:

1. Dispensing pharmacy:

It deals with extemporaneous compounding of small

Teacher's Signature : _____

Expt. No. _____

quantities of medicinal preparations like mixtures, emulsions etc.

2. Pharmaceutics :

It deals with the manufacturing of drugs on large scale & testing of the preparation for purity & strength.

3. Forensic pharmacology :

It deals with the drugs of regulating manufacturing on large scale, storage, packing, import & export of drugs. It also includes the laws governing the poison.

Following laws are prevailing in India :

Drug act 1930

Pharmacy act 1948

Rules : 1945

Drug control laboratories :

To keep a proper check on the quality of standard of drug government has established labs in all states.

In these labs drugs are analysed by chemical, biochemical, pharmacological & microbiological techniques.

Samples of drugs are sent to these labs by drug inspectors for their problem.

- NIPER (H.P.) - Hyderabad, Mohali, Hajipur, Ahmedabad
- CDRI - Lucknow.
- Regional research labs.

Teacher's Signature : _____

Expt. No. _____

Page No. 05

Pharmaceutical processes:

- They are used for manufacture of drugs & are divided into 3 groups:

1. chemical process
2. Extraction process
3. Comminution process

→ chemical process:

1. Fusion

- melting is done by means of heat-
- eg.- simple ointment.

2. Granulation:

- A concentrated solⁿ of a chemical sub^s is heated with const. stirring, the moisture is largely removed & a granular powder is formed.
- eg.- ferrous sulphate (IDA) & sodium sulphate.

3. Scaling:

- Preparation of drug in scale form, by spreading conc. solⁿ of drug in thin layer & drying it at low temp. then breaking it in small shiny scale.
- Ferric ammonium citrate.

4. De-sublimation:

- vapourising of solid sub^s & then recovery by condensation.
- eg: NH_4Cl , I_2 , camphor & sulphur.

Teacher's Signature : _____

Expt. No. _____

5. Dessication:

- Removal of H_2O of crystallisation from crystalline salts by heating in water bath or H_2O oven or sand bath etc.
- eg: ferrous sulphate.

→ Extraction process:

Vegetable drugs can be extracted by various methods. The following methods are commonly used.

- i) Infusion
- ii) Decoction - water is used as solvent
- iii) Percolation
- iv) Maceration - Alcohol is used as solvent

i) Infusion:

Active principles from vegetables drugs are extracted with boiled water in an infusion pot for 15 min. & then filtered. It is not stable & should be used in 24 hrs. eg. digitalis.

2. Decoction:

The drugs & water are boiled together for 15 min. & then filtered.

3. Percolation:

The raw material is packaged into a column in the percolator & soluble constituents are extracted by slow passage of a suitable solvent (menstruum) through the column eg. Tincture belladonna, musc vomica.

Teacher's Signature: _____

iv) Maceration: Latin: Macerare = to soak.

Properly comminuted drug is permitted to soak in menstruum until the cellular structure is softened & penetrated by menstruum & the soluble constituents are dissolved.

eg:- Tincture benzoin, Aloe.

→ Comminutions:-

The process include methods of reducing hard vegetables drugs to powder form by:

- a. Grinding.
- b. Levigation
- c. Disintegration.
- d. Shifting.
- e. Elutriation.

a) Grinding: Reduction of crude drugs to fine powder by mechanical ~~with~~ mills.
eg:- Nux-vomica & ergot.

b) Levigation: A solid subs. is ground in water thoroughly till it is made into a paste & then dried up.

c) Disintegration: Powdering of crude drug by high speed percussion in disintegrator.
eg:- Nux-vomica, ergot.

d) Shifting:- A powdered drug is made to pass

Teacher's Signature : _____

Date _____

Page No. _____ (1)

Expt. No. _____

through a sieve containing parallel wires of various closeness & powders of diff. finenesses are obtained.

e) Elutriation :- a process for separating particle based on their size, shape & density using a stream of air or liq. flowing flowing in a dirⁿ usually opposite to the direction of sedimentation.

The smaller or lighter particle rises to the top.
eg:- chalk, kaolin, calamine.

Pharmaceutical mathematics (Metrology):

The science which deals with measurement of wt. & vol. of any sub is known as metrology.

There are 3 types systems of measures:

1. Imperial systems
2. Metric systems
3. Domestic & household measurements

The following abbreviations are common & commonly used.

Measurement of mass :-

- Kilogram : kg, Kg
- Gram : gm, grm
- Milligram : Mg, mg
- Microgram : μ g, mcg.
- Pound : lb (425 gm)
- Ounce : oz, z
- Grain : gr.
- Dram : dr

Teacher's Signature : _____

Measurement of Length:

- Metre - M
- Centimetre - cm
- millimetre - mm
- inch - in

Measurement of Volume:

- Litre : L (dL or m^3 : SI unit)
- millilitre - mL
- cubic centimetre : cc
- fluid ounce : fl oz
- fluid dram : fldr
- Minim : min, m

I

Imperial system / Metric equivalents:

Imperial system

Metric equivalents

① Measure of mass:

1 lb - 16 oz

1 oz - 8 dr

1 dr - 60 gr (grain)

1 gr - 1/60 dr

Exact

→ 453.59 gm

→ 28.35 gm

→ 3.88 gm

→ 64.8 gm

Approx.

450 gm

30 gm

4 gm

65 mg

Avoirdupois system & Apothecaries system:
(wt. & vol.) solid (liquid)

② Measure of volume:

Expt. No. _____

Page No. 12

1 pint = 16 fl oz	→ 477.17 ml	475 ml
1 fl oz = 8 fl dr	→ 29.6 ml	30 ml
1 fl dr = 60 min	→ 3.69 ml	4 ml
1 min = $\frac{1}{60}$ fl dr	→ 0.059 ml	0.06 ml
$= \frac{1}{480}$ fl oz		

1 drop = 0.006 ml = vol. of one drop of liq.

1 gallon = 4 quarts → 3.8 litres

1 quart = 2 pint 1 gutta = 1 drop.

II Metric/Imperial equivalents.

1. Measurement of mass → (exact) (approx)

1 kg = 1000 gm	→ 2.2046 lb	2.2 lb
1 gm = 1000 mg	→ 15.4324 grs	15 grs
1 mg = 1000 µg	→ 0.0154 grs.	0.015 grs.

2. Measure of volume:

1 Litre = 1000 ml	→ 35.1969 fl oz	35 fl oz
1 ml = 1.000027 cc	→ 16.223 min.	16 min.

3. Measure of length:

1 metre = 100 cm.	→ 39.37 in.	39.4 in.
1 cm = 10 mm	→ 0.3937 in.	0.4 in.

III. House hold measurement:

House hold	Metric equivalent	Imperial equivalent
1 drop	0.06 ml	1 min.
1 ml = 16 drops		

Teacher's Signature : _____

1 tea spoon full = 4 ml	→	1 fl oz
1 dessert spoon full = 8 ml	→	2 fl oz
1 table spoon full = 15 ml	→	4 fl oz
1 tea cup full = 120 ml	→	4 fl oz
1 drinking glass full = 240 ml	→	8 fl oz
1 wine glass full = 60 ml	→	2 fl oz

Date _____

Exp. No. - 02

Page No. 15

Expt. No. _____

DRUG DOSAGE CALCULATION

Dose: It is fixed amount of drug given at a time & can be repeated at appropriate intervals to produce desired therapeutic effect.

Dose of a drug has to be qualified in terms of chosen response.

eg:- for Aspirin.

Analgesic for headache: 300 - 600 mg

Antiplatelet dose 60 - 150 mg/d

Anti inflammatory dose/oral 3 - 5 gm/d.

Dose are expressed in the following ways:

for adults:

Solids in mg or g or mg/kg/d

Liquids in ml.

Injections in mg/d or mg/kg/d.

Biological prepⁿ eg. penicillin, insulin in U/kg/d.

for pediatric patients:

Two methods are currently in use:

i.) Body surface area

ii.) Body wt. & age

Body surface area:

$$\text{Individual dose} = \frac{\text{BSA (m}^2\text{)}}{1.7} \times \text{adult dose}$$

Teacher's Signature : _____

Date _____

Page No. 17

Expt. No. _____

Age of the patient	Function of adult dose
20 yrs	1
15 - " -	$\frac{3}{4}$
10 - " -	$\frac{1}{4}$ $\frac{1}{2}$
5 - " -	$\frac{1}{8}$ $\frac{1}{4}$
2 - " -	$\frac{1}{16}$ $\frac{1}{8}$
1 - " -	$\frac{1}{16}$
3 months	$\frac{1}{20}$

* Strength of a preparation: It is expressed in:

- i) percentage strength
- ii) proportion strength

• Percentage strength:

percentage of an ingredients in a prepⁿ is an indication of the quantity of that ingredients in 100 parts of the preparation.

percentage concⁿ are expressed in 3 ways:

i) Weight in weight (w/w) :

Solid are mixed with solid.

eg. powder, ointment etc.

3% Fenamycin ointment contain 3 gm of fenamycin in 100 gm of ointment.

ii) Weight in volume (w/v) :

Solid are mixed with liquid eg. In mixture, Lotion etc

eg. 5% dextrose solution.

5 gm dextrose in 100 ml of infusion.

Teacher's Signature : _____

iii) Volume in volume (V/V) :

Liq. are mixed with liq.

eg: Emulsion & spirit

70% ethyl alcohol

70 ml ethyl alcohol in 100 ml aq. solⁿ

(70 ml ethyl alcohol + 30 ml water)

• Proportion strength : The strength is expressed in proportion.

eg: - 1 : 1000 adrenaline hydrochloride injection.

1 gm of adrenaline hydrochloride in 1000 ml of injection.

1 mg in 1 ml of injection.

Solution of various strength:

Proportion strength	percentage strength	Quantity/ml
1 in 1 (1:1) (1 gm in 1 ml)	100%	1 gm/ml
1 in 5 (1:5) 1 gm in 5 ml	20%	200 mg/ml
1 in 10	10%	100 mg/ml
1 in 20	5%	50 mg/ml
1 in 50	2%	20 mg/ml
1 in 100	1%	10 mg/ml.

Date _____

Page No. 19

Expt. No. _____

1 in 1000 0.1 % 1 mg/ml.

1 in 10,000 0.01 % 0.1 mg/ml.

Assignments:-

- How many ml of 1 : 10,000 solution would you need to obtain 1 mg of adrenaline?

1 gm of adrenaline is in 10,000 ml of solⁿ

1 mg - 10,000 ml.

10 ml Ans.

- Prepⁿ of 10 ml of 15% NaCl solutions?

15% in NaCl solution

15 gm in 100 ml of NaCl

1 ml = $\frac{15}{100}$ gm

10 ml in 1.5 gm.

- Prepare 50 ml of 1 : 5000 KMnO₄ solution?

1 : 5000 KMnO₄ solⁿ

1 gm in 5000 ml

1 ml = $\frac{1}{5000}$ g.

50 ml = $\frac{50}{5000}$ = 0.01 gm in 50 ml

10 gm in 50 ml.

Assignments:-

- Dopamine in a dose of 5 mg/kg/min is to be given as infusion to a 60 kg man. The dopamine

Teacher's Signature : _____

ampoule containing 200 mg/ml. is diluted in 500 ml of dextrose. calculate the rate of infusion. The vol. of ampoule is 1 ml.

$$\text{Rate of infusion (Drug dose)} = 5 \mu\text{g/kg/min.}$$

$$\text{weight} = 60 \text{ kg}$$

$$\text{Dopamine} = 200 \text{ mg/ml.}$$

$$\text{vol. of ampoule} = 1 \text{ ml.}$$

$$\text{Total vol.} = 500 \text{ ml.}$$

$$\text{Rate of infusion for 60 kg.}$$

$$= 5 \times 60$$

$$= 300 \mu\text{g/min.}$$

$$200 \text{ mg in } 500 \text{ ml.}$$

$$1 \mu\text{g in } \frac{500}{200 \times 1000} \text{ ml.}$$

$$1000 \mu\text{g} = 2.5 \text{ ml.}$$

$$300 \mu\text{g} = \frac{2.5}{1000} \times 300 \text{ ml.}$$

$$= 3/4 \text{ ml}$$

$$1 \text{ ml} = 16 \text{ drops}$$

$$3/4 \text{ ml} = 16 \times 3/4 = 12 \text{ drops}$$

2. Salicylic acid content 3 gm in 25 gm of Whitfield's ointment. Calculate the % strength of salicylic acid in this ointment.

Date _____

Expt. No. _____

Page No. 21

Total weight = 25 gm
weight of salicylic acid = 3 gm
3 gm - 25 gm.

$$1. \text{ strength} = \frac{3}{25} \times 100 = 12 \text{ gm.}$$

3. Quinine hydrochloride 600 mg is diluted in 500 ml of 5% dextrose solution. calculate the vol. of this solⁿ needed to deliver a dose of 10 mg/kg of quinine to a patient of cerebral malaria weighing 42 kg.

Soln:-

weight of patient = 42 kg

Rate of infusion = 10 mg/kg

Total volume = 500 ml.

Amount of quinine hydrochloride = 600 mg

Rate of infusion for 42 kg is = 42×10

$$= 420 \text{ mg}$$

$$600 \text{ mg} = 500 \text{ ml.}$$

$$1 \text{ mg} = \frac{500}{600} \text{ ml}$$

$$= 5/6 \text{ ml.}$$

$$420 \text{ mg} = 420 \times 5/6$$

$$= 350 \text{ ml.}$$

4. A child required to receive 360 ml IV fluid over a 12 hr period, calculate the rate of infusion in drops/min.

Soln:-

Time taken = 12 hr.

vol. of fluid = 360 ml.

Rate of infusion

Teacher's Signature : _____

$$12 \text{ hrs} - 360 \text{ ml}$$

$$1 \text{ hr} - \frac{360}{12} \times \frac{1}{60} \text{ ml}$$

$$= \frac{6}{12} \text{ ml} = \frac{1}{2} \text{ drops/min}$$

5. How many ml of 1:10,000 solution would you need to obtain 1 mg of adrenaline to a patient of anaphylactic shock.

Solve:-

$$1 : 10,000$$

$$1 \text{ gm in } 10,000 \text{ ml}$$

$$1 \text{ mg in } 10 \text{ ml}$$

6. A patient weighing 60 kg suffering from severe falciparum malaria is prescribed inj. Quinine dihydrochloride (600 mg/2 ml).

- 20 mg/kg (loading dose) diluted in 10 ml/kg 5% dextrose/saline and infused in over 4 hrs followed by
- 10 mg/kg (maintenance dose) in 10 ml/kg 5% dextrose saline IV infusion over 4 hrs every 8 hrs for 5 days.

Calculate the flow rate of the drug for loading dose and for maintenance dose. Also determine the no. of vials required.

Solve:-

$$\text{Weight of patient} = 60 \text{ kg}$$

$$\text{Rate of infusion} = 600 \text{ mg/2 ml}$$

Flow rate for loading dose.

$$\text{Rate of infusion for } 60 \text{ kg}$$

$$= 10 \text{ mg} \times 60$$

$$= 600$$

Date

Expt. No.

Page No. 23

20 mg/kg in 600 ml ~~0.5~~ 0.5

1200 mg

10 mg/kg → 600 ml 0.5

$$1 \text{ hr} = 600/4 \text{ ml.}$$

$$1 \text{ min} = \frac{600}{4 \times 60} \text{ ml.}$$

$$= 2.5 = 25 \times 16$$

$$= 40 \text{ drops/min.}$$

For maintenance dose

$$1 \text{ loading dose} = 1200 \text{ mg}$$

$$14 \text{ maintenance dose} = 600 \times 14$$

$$= 8400$$

$$= \frac{1200}{9600}$$

$$1 \text{ mg} = \frac{1}{600} \text{ amp}$$

$$= 9600 \times \frac{1}{600} \text{ amp}$$

$$= 16 \text{ amp}$$

Teacher's Signature : _____

Date _____

Expt. No. _____

Exp. No. :- 03

Page No. 25

DRUG REGULATORY ACT AND SCHEDULE DRUGS

• Drug Regulations :

Drug controller general of India (DCGI) and food & drug administration (FDA) are the regulatory bodies which governs the sale & dispensing of the drugs.

Drugs have been classified in the drug & cosmetic Act as per safety, addiction and liability and poisonous ~~form~~ from poison nature into following categories:-

- i) Schedule drugs
- ii) Over the Counter drugs (OTC).

1. Schedule drugs :-

Under the Drugs & cosmetic Act drugs are classified into certain schedule to regulation the importation, manufacture, distribution & sale.

The following drugs schedule are imp. for physician which are prescription related schedule.

i) Schedule C :

This consist of clinical value of biological & other special products.

eg:- Vaccine (injectable form), sera, insulin etc.

ii) Schedule F :

This depicts specification for the standards of blood bank.

Teacher's Signature : _____

iii) Schedule F_I :

It gives details of the standards of bacterial vaccine made from any microorganisms pathogenic to men or other animals & also the vaccine made from other microorganisms which have any antigenic value. eg: Anthrax, Brucella, etc.

iv) Schedule F_{II} :

It gives details for standards for surgical dressing and bandage cloth.

v) Schedule F_{III} :

It gives standards for umbilical tapes.

vi) Schedule FF :

It gives details of the standards for ophthalmic prepⁿ.

vii) Schedule G :

This provide list of drug prepⁿ with a label that state "Caution."

It is dangerous to use this prepⁿ except under medical supervision.

eg:- All anticancer drugs.

(Asparaginase, Busalphan, Blamycine etc)

viii) Schedule H : (Prescription drugs)

Drug includes in this schedule are sold by retailer only on production of valid prescription given by registered medical practitioner.

Date _____

Page No. 28

Expt. No. _____

eg:- Antibiotics, Atenolol, Alprazolam etc.

ix) Schedule J :

It gives the list of ailments (disease) for which no drug should claim prevention or cure.

eg:- HIV, high blood pressure, Diabetes mellitus, Bronchial asthma, myocardial infarction, leukaemias etc.

x) Schedule K :

This defines the condition under which certain circumstances registered medical practitioner & hospitals are exempted from provisions as given in chapter IV of Drugs & cosmetic act 1940 of India.

eg:- Quinine & other antimalarial.

xi) Schedule X :

It gives the names of psychotropic drugs requiring special licenses for manufacture & sale.

eg:- Amobarbital, Amphetamine, methyl phenidate, phenobarbitone.

xii) Schedule W :

This includes only few drugs that shall be marketed under generic name only.

eg:- Aspirin, ferrous sulphate.

But now it is omitted from Drug and cosmetic act.

Teacher's Signature : _____

(iii)

Schedule Y :

specific requirements and guidelines on clinical trials, import and manufacture of new drug.

2. Over the Counter drugs (OTC) :-

They are considered to be relatively safe drugs such as can be used for common diseases without prescription, eg:- Paracetamol, Aspirin, laxatives etc.

Schedule A :

gives the specimens of prescribed forms. formed to form 49.

Schedule B :-

States fees for test or analysis by the Central Drugs Laboratory or the govt. analysis.

Schedule D :-

is devoted to exemption regarding import of drugs.

Schedule E₁ :-

gives ~~at~~ a list of poisonous subs. under Ayurvedic, Siddha & Unani systems of medicine.

Schedule F to K

Schedule M :-

Deals with good manufacturing practices (GMP) and requirements of premises, plant and equipment for pharmaceutical products.

Date

Expt. No.

Page No. 29

Part I : deals with good manufacturing practices & requirements for factory premises.

Part II : deals with plant & equipment.

Schedule M I :

prescribes in detail requirements of factory premises for the manufacture of homeopathic drugs.

Schedule M II :

prescribes requirements of factory premises for manufacture of cosmetics.

Schedule M III :

Prescribes requirements of factory premises for manufacture of medical devices.

Schedule N :-

deals with list of minimum equipments for efficient running of a pharmacy & gives directions regarding;

- (a) entrance of a pharmacy.
- (b) Premises.
- (c) Furniture & apparatus, and
- (d) general provisions.

Schedule O :

deals with the provisions applicable to disinfectant fluids.

Teacher's Signature : _____

Schedule P :

deals with the life period of drugs including combinations with other drugs. It gives period in months for which the drug is expected to retain its potency under the conditions of storage notified by licensing authority.

Schedule P₁ :

deals with pack sizes & of drugs.

Schedule Q :

gives the list of dyes, colours & pigments permitted to be used in cosmetics and soaps.

Schedule R :

describe the standards for mechanical contraceptives.

Schedule R₁ :

prescribes standards for of medical devices. Sterile disposable perfusion set, hypodermic syringes & needles.

Schedule S :

prescribes standards for cosmetics.

Schedule T :

lays down the requirements of factory premises & hygienic conditions for Ayurvedic & Unani drugs.

Date

Expt. No.

Page No. 31

Schedule U and U₁ :

gives the particulars to be shown in manufacturing records.

Schedule V :

Gives the details of standards for patent & proprietary medicines.

Expt. No.

Exp. No. - 04

Page No. 33

Definition :-

A prescription is a written order of a physician to a pharmacist with names, dose of the drugs, instructions for preparation & dispensing for the pharmacist & mode of administration for the patient.

Parts of Prescription :-

1. Superscription
3. Subscription

2. Inscription
4. Signature

1. Superscription :-

It consists of name, qualification and address of physician and date, name, & age and address of the patient.

The symbol 'Rx' stands for the Latin abbreviation "Take thou" means you take. The oblique line after R is considered as an ancient invocation Chaldean physicians to "Jupiter" the god of healing.

2. Inscription :-

It is the body of prescription consist of name of drugs to be taken and the quantity of each. when there are more than one ingredient their order should be as follows:

- a) Base: It is pharmacologically most imp. active ingredient & is always written first.
- b) Adjuvant: It is a drug used to enhance the action of the base & it follows the base in serial order.

Teacher's Signature : _____

Date

Page No. 35

Expt. No.

- c) Corrective: It is a drug used to overcome any undesirable effect of base or adjuvants.
- d) Flavouring and sweetening agent: It is the substance which improve palatability of the preparation.
- e) Colouring agent: Substance which improve appearance,
- f) Vehicle: A substance usually inert ⁱⁿ which other ingredients are uniformly distributed. It has occasionally of medical value & may improve palatability of preparation.
3. Subscription: This is the dirⁿ to the pharmacist.
4. Signature: This contain dirⁿ to the patient (route, method, no. of doses, frequency of medication, duration of treatment, any special instruction).

Prescription

Alkaline Mixture

Dr. ABC

M.B.B.S.

Add. -

Date -

SUPERSCRPTION

for Mr. XYZ

Age:

Hospital No.

Address:

Rx

INSCRIPTION

Sodium bicarbonate

Sodium citrate

Compound tincture of Cardemom

water up to

G	or	ml
3		0
3		0
3		0
90		0

SUBSCRIPTION :- Mix and prepare a mixture. Divide in three doses.

Direction :- One dose to be taken 3 times a day.

SIGNATURE

Rx

"take thou" or "you take"

ABC

Reg. No XXX

a) Base

b) Adjutant

c) Corrective

d) Flavouring & Sweetening agent

Date _____

Expt. No. _____

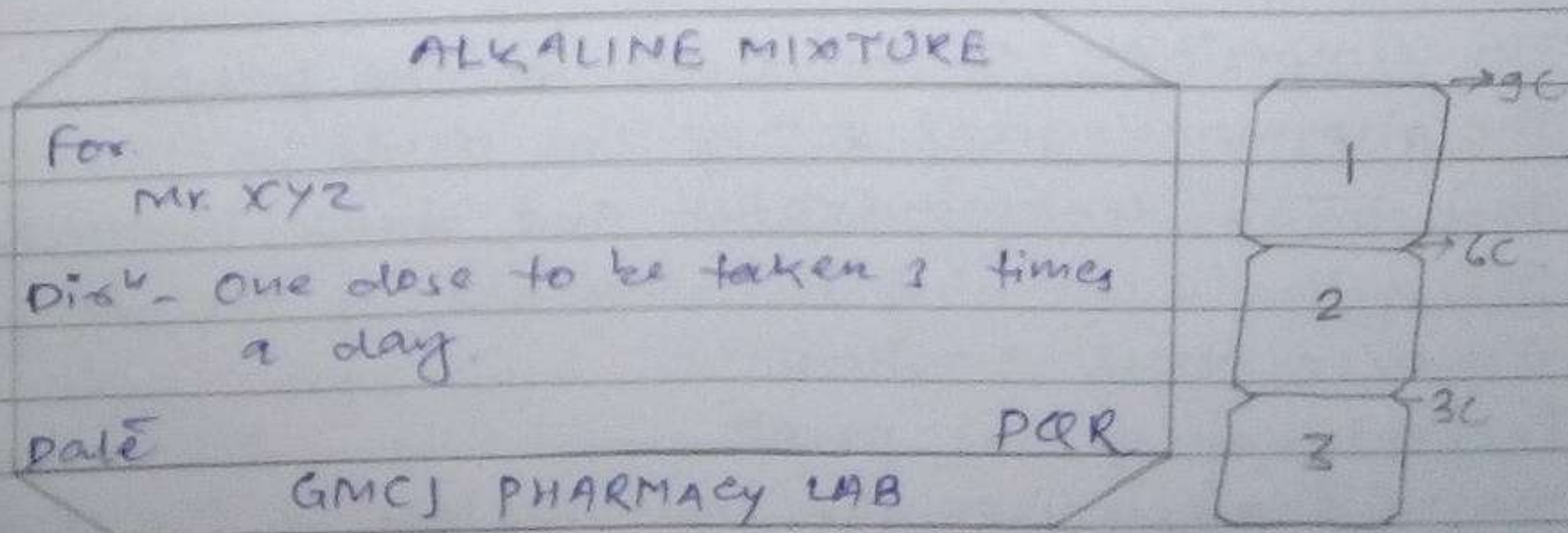
Page No. 37

- e) colour
- f) vehicle

Rules of dispensing :-

1. Check up the dose before making a prepⁿ.
2. After making a prepⁿ, prepare a label as follows :
 - Type of prepⁿ eg. mixture, lotion etc.
 - Patient's particulars
 - Disⁿ to the patient
 - No. of doses and date
 - Name of pharmacy
 - Signature of pharmacist.
3. Some special disⁿs to be mentioned whenever necessary in a capital letters.
 - "shake well before use"
 - for external use only.
 - protect from heat & light
 - Poison
 - For gargle, mouth wash etc.

Typical Label :



Teacher's Signature : _____

Label Reading :-

It is usually attached or printed on the container or strips and also on the outer carton. It provides useful information about the following:

1. Trade and generic name of the drug.
2. Type & formulation eg: lotion, syrup etc.
3. Ingredients of the prepⁿ & their quantity.
4. The dosage instructions.
5. The date of manufacture & expiry date of prepⁿ.
6. Instruction for the storage of prepⁿ.
7. Precautions & warning, if any, with respect to the use of the drug.
8. Address of the manufacturer & the marketer of the drug.
9. Batch no., MRP of the prepⁿ.
10. Schedule of the drug.

Package Insert :-

It provides vital information about the prepⁿ. It is placed inside the container. It is revised periodically & provides the following information.

1. Trade & generic name of the drug.
2. The composition of the drugs in the prepⁿ.
3. The pharmacological actⁿ of the drugs in the prepⁿ.
4. Indication, contraindication and dosage instruction.
5. Precaution & warning with the use of the drug.
6. Adverse drug reactions.
7. Presentation of the prepⁿ.
8. Name & address of the manufacturer & the distributor.

of the preparation.

9. Schedule of the drug.

Q.1. Explain shelf life of a dosage form.

Ans:- The period b/w date of manufacture & date of expiry is called the shelf life of a drug. It is a legal requirement that all pharmaceutical products must carry both the dates. Under specified storage conditions, products are expected to remain stable. The shelf life of a medicine is determined by the real time stability studies or by extrapolation from accelerated degradation studies. It also depends on the drug as well as storage condition. Studies have shown that majority of solid dosage forms (tablets, capsules etc) stored under ordinary condition remained stable (for 1-5 yrs) liq. formulations are less stable, suspensions clump by freezing. Injectable solⁿ may develop precipitate, become turbid on prolonged storage.

Loss of potency beyond the shelf life of the formulation & any effect on its usage is not the responsibility of the manufacturer.

CRUDE DRUGS

1. Bramhi (*Centella Asiatica*)

- Used in Hysteria, Epilepsy.

2. Ashwagandha (*Withania somnifera*)

- Used for vitality & vigour

3. Ajwain (*Trachyspermum ammi*)

- Treating diarrhoea, colic & other bowel problems stimulating the appetite & enhancing diet and beedi (cigarette made by rolling seeds in a leaf, used for medicinal smoking) is an effective remedy for bronchial asthma.

4. Pudin Hara (*Mentha piperita*)

- Relief from stomach pain, ache, gas & indigestion. It is a trusted fast action remedy for stomach disorder.

5. Sanay / Sana ka palā (*Cassia senna* Linn)

- constipation, jaundice, dyspepsia, nephritis, cough & bronchitis.

6. Saunf (Aniseed)

- Antispasmodic, antiseptic, aromatic, carminative, digestive, expectorant, stimulant, stomachic, tonic.

7. Vanshlochan (*Bambusa arundinacea*)

- help in all cough, coughing fever, T.B., Thirst

Teacher's Signature : _____

8. Kavzisi / Van Jeera (*Vernana anthelmintica* Linn)

- Remedy for round worms. Hence the name Vernana anthelmintica. The drug is used in the inflammatory conditions of the body such as hard swelling, swellings due to cold, and in cold tumours, to minimise the inflammation & as anti-inflammatory agent.

9. Anar (*Pomegranate*)

- Anthelmintic, alternative, astringent, hemostatic, laxative, refrigerant, vermifuge, stomachic, toxic.

10. Peepal (*Ficus religiosa*)

- Laxative, toxic, relieve feverish feeling, arresting secretion as bleeding, palpitation of heart & cardiac weakness, Dysentery.
Remedy for excessive urine output among jaundice.

11. Asandi (*Ricinus communis*)

- Useful in blood impurities like itch, boils, pimples & skin disorder. Also useful in Spermatorrhoea & nocturnal emission.

12. Home md clove (Clove)

[*Eugenia aromatica*]

- Animal studies suggest that clove can lower fever. Reduces inflammation after tooth extraction.

13. South (*Zingiber officinale* Rose)

- Hypolipidaemic, antiemetic, chemoprotective, antiviral,

antinauseant, antiinflammatory and anticancer properties of ginger & its efficacy against hyperemesis gravidarum & migraine.

14. Ginger/Adrak (*Zingiber officinale* Roscoe)
- Nausea and vomiting of pregnancy (hyperemesis gravidarum)

15. Tej patra
Indian Bay-Leaf (*Cinnamomum tomala*)
- stimulant, tonic, stomachic, carminative and astringent.

16. Ateesh (*Aconite*)
- Homeopathic medicine that has been used for nerve pain, headache, rheumatism (stiff and painful joints) and to treat cold & flu symptoms.

17. Babool (*Acacia*)
- Demulcent, mucilaginous.

18. Neem (*Azadirachta indica* A. Juss)
- strongly antiseptic, anti-fungal & anti-bacterial. relief of skin problems such as acne, athlete's foot and other fungal conditions, eczema, psoriasis, ringworm dandruff, scalp scaling, mouth ulcers & conditions. Head lice, thrush etc. help immune system stimulation, ~~adjuvant~~ adjunct in the management of diabetes II.

19. Haladi (Turmeric)

(*Curcuma longa* Linn)

- Antiseptic, several early animal & laboratory studies report anti-cancer (colon, skin, breast) contains curcumin.

20. Elaichi (Cardamom)

- Appetizer, carminative, diaphoretic, expectorant, stimulant, stomachic.

21. Eucalyptus oil (*E. globulus* Labillardiere)

- anti-inflammatory & mucolytic activity.

22. Black pepper (*Piper nigrum*)

- it excites local & general circulation, & is usable in atonic conditions of the stomach & locally in gangrene for antipericardic purposes, typhus, cholera collapse.

23. Jaifal (Myristica fragrans)

- Stimulate the digestion & to treat infections of the digestive tract.

24. Gandra Jau

- Used in Rx of sickle cell anemia in Chhattisgarh.

25. Green tea (*Camellia sinensis*)

- Research indicates that green tea may benefit arthritis by reducing inflammation & slowing cartilage breakdown, Antioxidant.

2. Compound powder - containing more than one ingredient. eg: ORS.
3. Effervescent powder:
When the powder is dissolved in water, there is effervescence (bubbling) due to evolution of CO_2 .
eg:- Seidlitz powder, Glucon-D, ENO powder.
4. Dusting powder: For external use only.
eg:- Talc powder, Neosporine powder.

Compressed Tablet

- The solid drugs are subjected to great mechanical pressure or pressed into tablets.
- contain no special coating. eg: erythromycin.

Coated Tablet

- The tablets are coated with a film like sugar to enhance palatability enteric coated to protect the drug from the effect of gastric secretion or film coated to protect the drug from effects of atmospheric O_2 or moisture.
- Enteric coated tablets are provided with one or more layers of coating intended to resist the gastric fluid but permit their disintegration in the intestinal fluid.
eg:- aspirin.

- Troches meant for oral administration are available in diff. shapes with flavoured base.
- The base may be hard sugar candy, glycerinated gelatin or combination of sugar & sufficient mucilage to give it form.
- Troches are placed in mouth where they dissolve slowly liberating the active ingredients.

Pellets

- Pellets are small sterile cylinder about 3.2 mm in diameter & 8 mm in length which are manufactured by compression.
- Pellet is implanted beneath the skin.
eg:- Norplant.

Suppository

It is cone shaped solid dosage form of various weights usually medicated for insertion into rectum, following insertion, the suppository melts at body temp.
eg:- Glycerine suppository.

Pessary:

- It is vaginal suppository. It is ovoid shaped with a rounded opening.

Pill:

- When powdered drugs are mixed with adhesive subs. like lig, glucose or honey, kneaded into a firm & adhesive mass.

Date

Expt. No.

Page No. 53

- Thin mass may be cut into desirable sizes & moulded into spherical or ovoid forms called pills.

Disadvantage:

- Pills become hard upon drying & when old may not dissolve in the alimentary tract so recently pills has been gradually replaced by tablet & capsules.
eg:- oral contraceptive pills (Ocp).

Expt. No. _____

Exp. No. - 07

Page No. 55

SEIDLITZ POWDER

Aim: prescribe, prepare & dispense a single dose of Seidlitz powder (compound effervescent powder)

Ingredients:

	G or ml	
• Sodium potassium tartarate	7	5
• Sodium bicarbonate	2	5
• Tartaric acid	2	5

Method of preparation:

- weigh sodium potassium tartarate and sodium bicarbonate separately and grind them together to a fine powder in a pestle & mortar. wrap this powder first in a wax paper and then in a blue paper (to distinguish it from powder B) & mark it as powder A.
- Tartaric acid is now weighted and grind to a fine powder and wrapped in wax paper and marked as powder B.
- The paper size of wax paper should be approximately 5x7", while the final wrapping paper may be slightly bigger to accommodate the two powder A & B.
- The two packet (A & B) are kept in a big packet and label it.

QIVAS

Q.1. What are the use of Seidlitz powder?

- A: As a saline purgative in acute functional constipation
- As carminatives.
 - prepⁿ of bowel before surgery.

Teacher's Signature: _____

PRESCRIPTION :-

DR A.B.C.
MBBS
Add:
Date:

FOR Mr XYZ

Age
Address:
Hospital No.

Rx

- Sodium potassium tartarate
- Sodium bicarbonate
- Tartaric acid

G or ml	
7	5
2	5
2	5

Mix & prepare powder and send such one dose.

Direction: Dissolve powder A in $\frac{1}{2}$ glass of water & then add powder B & take while effervescing.
To be taken early morning on empty stomach.

ABC
Reg. No. xxx

LABEL :

SEIDLITZ POWDER	
For Mr XYZ	
Direction: As directed by physician.	
Date: 20/01/15	PCR
GMCS PHARMACY LAB	

Expt. No. _____

Page No. 56

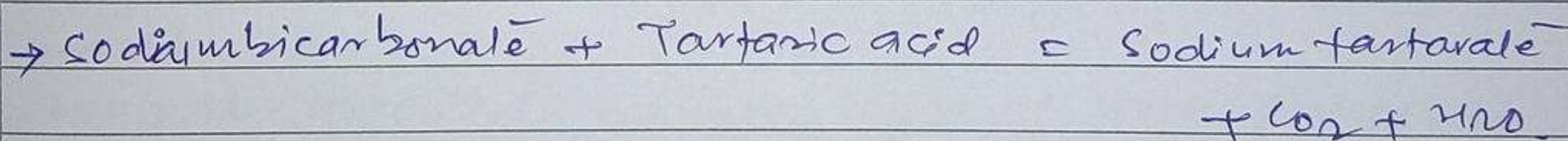
- In food & drug poisoning.
- As after purge in treatment of tape worm infestation.

Q.2. Why it is called as Seidlitz powder?

Ans: Seidlitz powder is a saline (osmotic) purgative & is named after Seidlitz spring in (Czechoslovakia) which has laxative properties although it contains magnesium sulphate & not tartaric acid.

Q.3. How does the Seidlitz powder act?

Ans: Sodium potassium tartrate is unabsorbed in the intestine act mechanically as osmotic purgatives by retaining water in the gut causes evacuation in 3-4 hrs. Sodium bicarbonate react with tartaric acid when prepⁿ is added to water. The evolved CO₂ produce effervescence which masks the salty taste of Na-K tartrate.



Q.4. Why are the two powders packed separately?

Ans: As sodium bicarbonate & tartaric acid are both hygroscopic. It is advisable to wrap them first in two diff. papers.

Q.5. What is purgative? Classify them according to mechanism of action with example?

Q.6. How do saline purgative act?

Q.7. What will happen if these two powders are taken separately?

Teacher's Signature : _____

Prescription:

Dr. ABC

MBBS

Add:

Date:

For Mr. XYZ

Age:

Address:

Hospital No:

Rx

Sodium chloride

Trisodium citrate

Potassium chloride

Glucose

G or ml	
2	6
2	9
1	5
13	5

Mix & prepare a powder

Direction: Dissolve the powder in 1 lit. of pre-boiled and cooled water then take fluid as directed by physician.

ABC

Reg. No. XXX

LABEL:

ORS POWDER

For Mr. XYZ

Dirⁿ: Dissolve the powder in 1 Lit. of preboiled and cooled water then take fluid as directed by physician.

Date:

PCR

GMCT PHARMACY LAB.

At higher concⁿ glucose appears in the stool & takes its osmotic property $\rightarrow$ stool vol. $\uparrow$.

Study:-

Efficacy of ORS in children $\bar{c}$ acute cholera diarrhoea is improved by reducing Na⁺ glucose concⁿ to 75 mM total osmolarity. (to 245 mOsmol/L). The need for supplemental iv therapy was $\downarrow$ 33%. Stool vol. $\downarrow$ 20%. Incidence of vomiting $\downarrow$ 30%.

Cholera (children & adults) This ORS (new) proven effective & safe.

$\rightarrow$ Risk of hyponatremia in adults $\bar{c}$ cholera WHO & UNICEF recommended replacement of standard ORS (310 mOsmol/L) to new ORS 245 mOsmol/L.

WHO

ORS - bicarbonate

				Weight	ORS - Citrate	
NaCl	3.5 gm	NaCl	Home measure 3/4	2.6 gm	Na ⁺	75 mM
NaHCO ₃	2.5 gm	Tri-sodium citrate	1/2	2.9 gm	K-citrate	10 mM
KCl	1.5 gm	KCl	3/4	1.5 gm	Cl ⁻	65 mM
Glucose	200 gm	Glucose	1/2	13.5 gm	K ⁺	20 mM
Water	1 H	Water		1 Lit.	Glucose	75 mM
					Total osmolarity	

Glucose 20 gm = Sucrose 40 gm = Cae Kedsice 50 gm powder.

K⁺ - important constituent of ORS.

most acute diarrhoea K⁺ loss is substantial

Base (bicarbonate, Citrate, Lactate)

correct acidosis due to Alkali loss in stools independently promote Na⁺ & water absorption.

Expt. No.

Page No. 61

- Relying on the ability of kidney to restore acid-base balance, acidotic states have been managed with an exogenous base.
- Base free ORS - rehydration is effective. correction of acidosis is slower.

base $\rightarrow$ non-essential constituent of ORS, beneficial in severe cases of over acidosis.

Action of ingredients:

1. Na^+ - chief extracellular composition. It maintains osmotic pressure, acid-base balance, nerve conduction, muscle contraction etc. (depolarisation).
2. K^+ - chief intracellular action - useful in muscle contraction & neuromuscular stability (depolarization).
3. Cl^- - Major extracellular anion & along with Na^+ it helps to regulate osmotic press. & maintain blood pH.
4. Na-citrate : helps to maintain pH & corrects acidosis.
5. Glucose acts as nutritional supplement providing energy & also it facilitates the transport action of electrolytes.

Therapeutic Uses:-

1. For treatment of fluid depletion, eg: shock, acidosis, diarrhoea, dehydration.
2. Others - post surgical, post-burns, post-trauma, heat stroke.
3. change over from parental to oral therapy.

Teacher's Signature :

ORT is not designed to stop diarrhoea, but to restore & maintain hydration, electrolyte & pH balance until diarrhoea, ceases, mostly spontaneously.

Expt. No.

Exp. No. - 09

Page No. 62

LIQUID DOSAGE FORMS

Solutions

• Nasal solution (Nasal drop)

Ear drop

Eye drop

Mouth wash & mouth gargle

Contact lens solution.

→ Mixture

→ Syrups

→ Magma & Milk

→ Elixir

→ Linctus

→ Emulsion

→ Suspension

→ Gel

→ Enema.

Contents of Lig. formulation :

I) Vehicle : It is used to dissolve or suspend the drugs.
commonly used vehicles are:

Water : It is used to prepare solⁿ of volatile oils or other aromatic sub^s. eg: chloroform or cinnamon water.

Syrup : It is a solution of flavouring or medicinal sub^s. in a saturated solⁿ of sugar in water.
(eg: Simple syrup).

Elixir : It is sweetened, pleasantly flavoured liq used to dissolve the medicinal sub^s.

Teacher's Signature : _____

Expt. No. _____

• Magma: These are bulky suspensions of poorly soluble subs. in water (milk of magnesia).

3. Alcoholic solutions: concentrated alcoholic solⁿ of volatile subs. Alcohol serves as both preservative & solvent. eg: Aromatic ammonia spirit.

4. Extractive preparations: These are from vegetable drugs containing the active ingredients in hydroalcoholic solvent. eg: tincture belladonna.

NASAL DROPS :

These are solution of active ingredients in a vehicle suitable for instillation into nose.

They should not contain an oily base.

They are called as decongestant or local haemostatics.

Three drops cover most of the walls of the nasal cavity with the P/B in a supine position of head tilted back & turned to left and right.

EAR DROPS :

They are solⁿ of drugs to be instilled in ear with a dropper. eg. chloramphenicol.

• They container capacity of such prepⁿ is 10-15 ml.

The containers are available as plastic squeeze bottles or glass dropper bottles a dropper cap.

CONTACT LENS SOLUTIONS :

They are used daily for cleaning & lubricating the contact lenses. Two of solutions are available.

Teacher's Signature : _____

- i) Wetting solⁿ - used primarily for heating the lens before insert to make insertion easy & comfortable.
- ii) Storage solⁿ - They are used for cleaning & for preventing drying of lens.

MIXTURES :

Mixture is a liq. medicament containing one or more soluble or insoluble ingredient meant for internal use. Single dose mixture is k/as 'draught' or 'haustus'.

Classification:

Class I :- Simple mixture, containing soluble substances.
eg. Carminative mixture.

Class II :- Mixture containing diffusible solids. eg: reconstituted cephalixin mixture.

Class III :- Mixture containing indiffusible solids.
eg. antacid mixture.

Class IV :- Miscellaneous mixture eg: Liq. paraffin emulsion.

SYRUP :- It is concentrated sucrose solⁿ in water or other liq.

- Alcohol is added as preservative.
- Syrup has remarkable masking properties for bitter & unpalatable drugs.
- Preferentially used in pediatric age group.

MAGMAS AND MILK :- These are thick, viscous suspensions containing large particles of insoluble, inorganic drugs meant for internal use.

Expt. No. _____

Page No. 67

- Magmas & milk should be shaken well before use.
- Avoid freezing.

ELIXIR :

There are clear, pleasantly flavoured, sweetened hydroalcoholic liq. intended for oral use.

Elixirs contain ethanol, water, glycerine, sorbitol, propylene glycol, flavouring agents & preservatives.

LINCTUS : There are viscous, liq. prepⁿ containing high proportion of sucrose, usually prescribed for relief of cough. They are to be supplied & swallowed undiluted.

Suspensions : A suspension is a liq. medicament containing insoluble solid subs. that are homogeneously distributed throughout the vehicle with or without the help of suspension agent.

Suspending agents :-

- suspending agents are the substances that help insoluble or indiffusible substances to stay in uniform distribution throughout the liq. medicament for sufficient time to ~~ens~~ ensure uniformly in each dose.
- They must be pharmacologically inert.
- eg: gums, syrups, starch, mucilage, glycerine, honey etc.
(Gums are the most efficient suspending agent.)

Advantage of Suspension :-

Insoluble subs. can be administered in liq. form, ensure uniformity of dosage.

Signature : _____

Disagreeable taste can be covered by using a suspension.
Suspensions are chemically more stable.

EMULSION :

The mixture of two immiscible liquids, one of which is dispersed uniformly with the help of emulsifying agent.

Emulsifying agent : It is a sub. which help in the formation of eme.

egs: Gum acacia, Gum tragacanth, egg yolk, Bees wax, wool fat.

Advantages of emulsions :

- They help in administration of subs. that are naturally immiscible.
- Masks the unpleasant taste & make it more palatable.
- The phase that is finely divided is more easily absorbable in the form.

Types of Emulsions :

(A) oil in water (o/w)

oil is dispersed in water. egs: lig, paraffin emulsions.

(B) water in oil (w/o)

water is dispersed in oil which is continuous phase.

egs: cold cream, Butter.

GEL : Gels are semisolid colloidal solutions or suspensions which are non-greasy, water miscible, easy to apply anal wash, & suitable for hairy parts, provide faster release of drug substances. independent of the

Expt. No. _____

Page No. 69

water solubility of the drugs as compared to cream & ointment.

Uses:-

Used as lubricants for catheter & base.

Nace gel is used for ECG.

Fluoride gel for tropical dental use.

Prostaglandin E₂ gel is used for intravaginal administration.

Enema: It is a liq. preparation meant for rectal administration. Two types:

a) Evacuation Enema.

b) Retention Enema.

a) Evacuation Enema:

Employed to evacuate the bowel.

Water, stimulate the rectum by distension while soap act as irritant stimulant.

The quantity of fluid administered at a time is about 600 ml. Useful for treating constipation. before surgical operations, delivery & radiological investigations.

eg: soap water enema.

b) Retention Enema: Fluid containing the drug is retained in the rectum so that the drug

may act locally as well as systemically.

Quantity of fluid administered usually: 100-120 ml.

eg: prednisolone enema in ulcerative colitis.

Teacher's Signature: _____

EYE DROPS :

These are aq. or oily solutions or suspensions of medication, meant to be instilled into conjunctival sac.

general characteristics

The pH of the solⁿ should be as near as the pH of of human tear as possible.

The container should provide stability & protection from light when required.

The label should mention the names & percentages of active ingredients as well as subs. They should mention clear & complete instruction regarding the use of prepⁿ, storage & expiry date.

Crystal formation should be looked & such prepⁿ discarded as they may lead to primitive & abrasion.

MOUTH WASH & MOUTH GARGLE :

A mouth wash is an aq. solⁿ which is most often used for its deodorant, cleansing & antiseptic effect are for control, dental plaque.

Mouth wash may contain glycerine, synthetic sweetness, analgesic surface active agents; flavoring & colouring agents.

Mouth wash are also used for the relief of pain with ulcerative lesions of mouth, t/t of oropharyngeal infection.

Expt. No.

Exp. No. - 10

Page No. 71

CASTOR OIL EMULSION

Aims- prescribe, prepare & dispense castor oil emulsion for patient suffering from functional constipation.

Ingredients:

	G or ml	
Castor oil	8	0
Gum acacia	2	0
Water upto	30	0

Method of preparation:

- 1) Wet gum method
- 2) Dry gum method.

I. Wet gum method:

1. Making of primary emulsion
2. Dilution of primary emulsion.

1. Making of primary emulsion:

- Weight the required quantity of powdered gum acacia & transfer into mortar.
- Add H₂O double the quantity of gum acacia & triturate to form a good mucilage.
- Take the required quantity of castor oil in a drop measuring cylinder.
- Add oil drop by drop in the mortar while triturating continuously & rapidly in a clockwise/ Anticlockwise dirⁿ to form a uniform mixture.
- If it turns more oil but if necessary add a few drops of H₂O & continue titration till homogeneous mixture is formed.

Teacher's Signature: _____

Dr. ABC

M.D.B.S., M.D.

Address -

Date: 23/01/15

For Mr XYZ

Age:

Address:

Hospital No:

Rx

	G or ml	
castor oil	8	0
Gum acacia	2	0
water upto	30	0

Mix & prepare emulsion & send one such dose.

Direction: One dose to be taken early in the morning.

ABC

Reg. No. xxx

LABEL:

CASTOR OIL EMULSION

Shake well before use

For
Mr XYZ

Dirⁿ: One dose to be taken early in the morning.

Date: 03/12/15

GMCJ Pharmacy Lab

Questions - ① What precaution should be taken while preparing emulsion?

Ans. - ① Pestle & mortar should be completely dry.

- measure oil & water separately
- move pestle & in one dish only.
- Add oil drop by drop.

Date _____

Expt. No. _____

Page No. 73

- • Then again add the remaining portion of oil & titrate till primary emulsion is formed.

Primary emulsion is indicated by:

- white cream colour
- Typical cracking sound is heard.
- No oily particle is seen.

Dilution of primary emulsion

- Now dilute this with water a little water & constant titration.
- Transfer this to a measuring cylinder & make up to required volume.
- Transfer it in dispensing bottle & label it.

II. Dry Gum method:

- Take the required quantity of oil in a dry measuring cylinder.
- Weigh gum acacia & put it in a dry mortar.
- Add whole quantity of oil in the mortar & titrate lightly for a moment.
- Take twice the quantity of water as that of gum acacia & add it all at once to the contents of mortar & titrate continuously & rapidly until a thick white creamy primary emulsion is formed.
- The remaining is same as wet gum method.

Teacher's Signature : _____

Que:- What is an emulsion? What are the types of emulsion?

A:- Emulsion is a mixture of two immiscible liq. one of which is broken up into minute globules (particles) & each globule being surrounded by a thin film of emulsifying agent & then uniformly dispersed throughout the other liquid.

* phases of an emulsion : 3 phase

- i) Internal / dispersed / discontinuous phase is that which is broken down into globules.
- ii) External / Dispersion / continuous phase is that in which the internal phase is dispersed.
- iii) Intermediate or Interphase is that which converts the globules or prevents coalescence. It is also known as emulsifying agent or emulgent.

Types of emulsion:

i) Oil in water (O/W) :

Less oil & more water. Here the dispersed media is oil & dispersion media is water.
eg:- castor oil emulsion, liq. paraffin, milk.

ii) Water in oil (W/O) :

Less water & more oil. Here the dispersed media is water & dispersion media is oil.
eg:- cold cream, Butter etc.

Expt. No. _____

Exp. No. - 11

Page No. 75

Instruments Used in pharmacy

1. Dispensing balance:

- It is also known as prescription balance.
- It is usually used for weighing medicinal substances.
- Before use, ensure that the pans are clean & pointer is on the zero mark of the scale of dispensing balance.
- powdered chemicals & liq. should be weighed on a weighed glass or a weighed tube, but not directly on the pan.
- See that the beam is not in motion while putting in or removing an object or a weight from the pan.
- Always use forceps for lifting the weights.
- Put weights on the right hand pan & drugs on the left hand pan.
- It is reasonably accurate & can weight with ($\pm 5\%$ error).
- It ~~is~~ cannot measure quantities less than 50mg for which a chemical balance can be used.
- The max^m amount which can be weighed is about 210 gms/l.

2. Pestle and mortar:

- It is used for grinding & mixing the ingredients.
- There are made of either porcelain or glass.
- There are used for crushing solid ingredients to powdered form, as well as mixing two or more substances.

3. Spatula: These are made of

- a) stainless steel
- b) ebonite

Teacher's Signature : _____

- They are used to pour out drugs from container.
- They are also used for mixing powder, ointments etc.
- They are also helpful in spreading plasters.



4. Pill tile:

- It is porcelain slab
- It is used for making powders & mixing substances.
eg:- in making of pill & ointments.

5. Glass measures:

- Conical or cylindrical glass measures are used for measuring the solvents & solutes.
- These are available in capacities from 5ml to 1000 ml.
- Lesser quantities are measured with the help of graduated pipettes.

— [beakers
cylinders

Stirrers or glass rods:

It is used to dissolve salts in solvent.

7. Funnels:

- For filtering liq. prepⁿ.
- 5, 7, 10 cm in sizes.

Expt. No. _____

Containers for the drug (Dispensing bottle).

- white, round & small bottles should be used for draught, gargles, mouthwash etc.
 - Round blue or amber coloured & corrugated bottles should be used for preparations for external use such as lotions & liniments in order to prevent reaction of light & to make it identifiable from a distance.
 - Graduated flat or blue or amber coloured bottles should be ~~not~~ used for mixtures.
It is not ideal as graduation marks may be incorrect, so, a dose making slip is necessary.
 - wide mouthed jar or packets.
- ointments & paste.
 - packets or boxes.
- powders.
- stock bottle (Reagent bottle)
for keeping reagent.

Wrapping paper :

Wax paper :

- some subs. are volatile in nature.
eg. Ammonium carbonate, camphor etc.
- some are hygroscopic in nature.
eg. Tartaric acid, sodium acetate.
ferric ammonium chloride.

Teacher's Signature : _____

General instructions :

1. Students should bring apron, journal, scissors & fractional weight box to attend the particles.
2. Avoid deliberate wasting of drugs.
3. Replace the formulations in the respective packages after studying them.
4. The desk & apparatus should be cleared at the end of practical.
5. The full record of the practical work done & assignment should be maintained in the journal. It should be neat & tidy.
6. The day to day exercises should be written on the same day & the journal & signed by the concerned teacher before leaving the laboratory.

Expt. No.

Exp. No. - 12

Page No. 79

TURPENTINE LINIMENT

Aims - Prescribe, prepare & dispense turpentine liniment for patient suffering from joint pain.

Ingredients:

	G or ml.
• oil of turpentine	19 5
• camphor	1 5
• soft soap	2 7
• water upto	30 0

Method of preparation:

1. Take the required quantity of turpentine oil in measuring cylinder.
2. Measure the required quantity of camphor & transfer it into mortar then crush it into fine particles & transfer the contents into the measuring cylinder containing oil. Dissolve the camphor with the help of glass rod.
3. Measure the required quantity of soft soap & transfer it into mortar. Add water 3 times the vol. of soft soap into the mortar. Triturate the content continuously & rapidly.
4. Add oil drop by drop into the mortar with continuation trituration.
5. Add small quantity of water & transfer the content into measuring cylinder & make the vol. upto 30 ml with more of water.
6. Transfer the content into amber. Coloured dispensing bottle.
- * Cork & label it.

Teacher's Signature : _____

PRESCRIPTION :

Dr. ABC

MD

Address:

Date: 24/02/15

For Mr. XYZ

Age: Sex:

Adel:

Hospital No:

Rx

oil of turpentine

camphor

soft soap

water upto

G or ml

19 5-

1 5-

2 7

30 0

Mix & prepare the liniment.

To be applied externally on the affected part with friction.

Do not apply on broken skin.

ABC

Reg. No xxx

LABEL :

TURPENTINE LINIMENT

for external use only

SHAKE WELL BEFORE USE

For Mr. XYZ

Dis: To be applied externally on the affected part with friction.

Do not apply on broken skin.

Date: 24.02.15

PQR

GMCI PHARMACY LAB.

Expt. No. _____

Page No. 81

Q.1. What are the uses of turpentine liniment?

A: Used externally in cases of

- i) joint pain & arthralgia
- ii) Muscle pain & myalgia.
- iii) Fibrositis
- iv) Sprain & bache ache

Q.2. What is a liniment?

A: Liniment is a liq. or semi-solid preparation which are applied externally by rubbing on affected parts & acts as counter irritant. They may be in the form of emulsion, or suspension or solution or ointments.

Liniment containing alcohol produces better effect as compared to liniment containing oil base.

- eg:-
- 1) Liniment turpentine
 - 2) Liniment of olive oil.
 - 3) Iodine etc.

Q.3. Diff. between irritant & counter irritant?

A: Irritant are agents which produce more or less local inflammatory reactions. when used locally. counter irritant are agents which are applied local to irritate the intact skin for the purpose of relieving deep seated pain.

Q.4. Diff. between types of irritants & counter irritant?

A: Irritants are of three types:

- a) Rubefacients: agents producing mild irritation.
- b) Vesicants: stronger irritant causes blistering.

Teacher's Signature: _____

c) Pustulants : agents which causes irritation & small discrete suppurations.

Counter irritants are of two types:

a) Physical counter irritants: Hot water bag, short wave diathermy, radiant heat, Galvanic current.

b) Chemical counter irritants:

Turpentine, Camphor, Menthol, methyl salicylate, Black mustard.

Mechanism of action of Counter irritants:

1. Irritation of afferent nerve endings produces arteriolar vasodilation in the adjoining areas of skin by axon reflex & through segmental association of afferents, vasodilation also occurs in the corresponding deeper organs & increased blood supply helps to remove the pain producing metabolites, like substance P.
2. When a counter irritant is applied to the area of the skin supplied by nerves from the same segment as the deeper organs - from which pain producing impulses are coming, the cutaneous impulses obscure the deeper sensations & is perceived as relief of pain.
3. It is suggested that these skin impulses also causes release of endogenous pain relieving substances like endorphins & enkephalins in the brain.

Expt. No. _____

Page No. 83

Role of individual Ingredients :

Turpentine oil :

obtained from specie of pinus tree, the resin is obtained from the bark of live pinus tree & rectified (distilled).

- It act as a counter irritant.

Camphor :

derived from bark of cinnamomum camphor tree.

- It act as a antiseptic, rubefacient, counter irritant, & also has carminative, expectorant. property.

Soft soap.

- it act as emulsifying agent.

Water

- it act as a vehicle.

Q. Draw & describe the pain pathway.

Q. What precaution will you take while applying Liniment.

Teacher's Signature : _____

Expt. No. _____

Exp. No. - 13

Page No. 85

TOPICAL DOSAGE FORMS

1.)

* Lotion - eye lotion, mouth wash

* Liniment

* Ointment

* Paste

* Cream

* Paint

* Plaster

* Ocusexts

* Suppository

* Gel

* Powder

2) Topical dosage forms:

This refers to external application of drug due to the surface for localized action.

They have one or more of following effects.

- Bacteriostatic & bactericidal effect
- Disinfectant & cleansing action
- Antifungal action.
- Astringent effect
- Local & surface anaesthesia
- analgesics or anti-inflammatory activity.
- Emollient action.

3) Classification for of topical dosage forms based on physical state:

A. Solid	powder
	Aerosol
	Plaster
B. Liquid	Lotion
	Liniment
	Solution
	Emulsion
	Suspension
	Aerosol
C. Semi-solid	Ointment
	Cream
	Paste
	Gel
	Suppository

Expt. No. _____

15. Transdermal adhesive patch.

In these adhesive patches, the drug is incorporated into a polymer (usually polyisobutylene) which then is bonded to an adhesive plaster. The drug is delivered at the skin surface by diffusion. These preparations are designed to provide steady & smooth plasma concⁿ of the drug for a period ranging from 1-3 days from the site of their application (usually chest, abdomen, upper arm or mastoid region). e.g. transdermal patches of nitroglycerine (Nitroderm - TTS), nicotine (Nicotine II - TTS) & estradiol (Estraderm - TTS).

4. Plasters:

It contains a drug mixed in a resinous base spread over a muslin cloth. Some plasters are coated with water repellent film also. The preparations remain hard at room temperature but becomes sticky at body temp. They are meant for protective action & also for antiseptic action e.g. zinc plaster
Belladonna plaster
Band-Aids.

It also provides mechanical support & hence lessens pain in fracture of bones.
e.g. plaster of Paris.

5. Lotion:

It is a liq. prepn. containing medicinal ingredients meant for local action & usually used externally. They include: eye-wash

Teacher's Signature: _____

mouth wash

gargles

solutions for urethral or vaginal irrigation.

They are applied without rubbing.

They have soothing & protective property & acts as antiseptic, astringent, & anti-pruritic agents.

eg:- Zinc-Calamine lotion

providone iodine scrub lotion.

Liniments:

These are liq. medicaments or semi-solid prepⁿ to be rubbed on skin with friction.

It contains drug in a liniment vehicle (fixed oil or soap) and water or alcohol.

They might be either emulsion or solutions.

It may contain substances possessing analgesic, sub-facient, soothing & stimulating properties.

They act as irrigant & counter-irrigants.

One ingredient is usually camphor which reserves as counter-irritant.

These are mainly used as pain relievers or as rubefacient (making skin red).

eg:- Liniment camphor

Liniment turpentine

Inhalants:

Liquids preparations containing a drug to be inhaled as vapour. eg:- tinc. benzoin inhalation & Karvol Inhalant. The contents may be poured into a jug of boiling water & inhaled. Solid inhalants like Finckel Tinctal

Expt. No.

Page No. 89

(Sod. cromoglycate) are inhaled with the use of turbo spin inhaler.

8. Aerosols:

The drug dissolved in liq. is put inside a cylindrical container, (nebulizer) is then filled with a propellant gas (air or oxygen) under pressure. A push at the valve releases the drug through a microfine orifice in the form of mist which is inhaled. If one push releases a measured dose of the drug, then these are called as 'metered aerosols' eg. salbutamol metered aerosol, terbutaline metered aerosol.

9. Paint

It is a liquid preparations. These are simple solutions of medicine in vehicle viscid or other suitable solvents. meant for local applications, to the mucous memb. or skin (coloured paints are called as pigmentum).

eg:- Mandel's paint, Gention violet paint)

skin paints often have a volatile solvent. eg:- Tincture iodine, that evaporates quickly to leave a dry or resinous film of medicament, while paints for mucous memb. ~~can be~~ are more viscous due to high content of glycerine which adhere to the affected site & thus prolongs the action of the medicament.

eg:- Mandl's paint.

10. Creams:

Viscous liquids or semi-solid emulsion of either

Teacher's Signature: _____

O/W or W/O types. These include:

a) water removable bases.

b) variety of cosmetic-type preparation.

creams of O/W type include shaving creams, hand cream & foundation creams. Creams of W/O type include cold creams & emollient creams.

11. Pastes:

They are semi-solid preparation intended for external application.

They contain more than 10% of powdered medicament mixed with soft or liquid paraffin or with a non-greasy base, made up of glycerine, mucilage (starch) or soap like (Carboxymethyl cellulose).

They are generally applied to acute lesions with oozing surface. eg: eczema.

Difference from ointments:

- Non-greasy
- high proportion of powder
- more absorptive
- Less penetrating & macerating

eg:- zinc oxide paste
toothpaste etc.

12. Gels:

The drug is dissolved in a liq. & then dispersed in some gelling agent (soft gelatin) etc. These are usually transparent preparations. eg: contraceptive gels. However the term is also used for colloidal aq. suspensions of hydrated inorganic substances. eg: aluminium hydroxide gel.

Expt. No. _____

13. Suppositories (Rectal), Pessaries (Vaginal) and Bougies (urethral) :

These contain the drug mixed with glycerine or gelatin or hard soap or cocoa butter. These remain solid at room temperature but become slippery & melt at body temperature.

Suppositories are bullet-shaped, pessaries are conical, while bougies (for both male & female urethra) are pencil shaped.

eg - Dulcolax suppositories.

candizole T (miconazole + triadazole).

vaginal pessaries.

14. Ointments :

These are soft, semi-solid masses containing the drug in a greasy base (like soft or hard paraffin or woolfat). They are meant for external application & ~~to~~ is of such consistency that they can be applied readily. They are applied to the skin by insertion (rubbing).

The functions of ointments are:

Emollient

Soothing

Astringent

Antiseptic

Anti-fungal.

They contain petroleum base like paraffin emulsifying agent like soap & preservative like benzoic acid.

They are dispersed in jars, bottles, metal boxes & compressible tubes.

Teacher's Signature : _____

eg: Soframycin skin ointment &
silver sulfadiazine.

Some ointments are prepared in a water miscible base (vehicle). Ophthalmic ointments are sterile medicated ointments for eye ointments. eg:
chloramphenicol eye ointment
atropine eye ointment.

Ointments are classified as:

i) epidermic ointments: Acts on the surface of skin.
eg: Whitfield.

ii) Endodermic ointments: partially penetrate the skin.
eg: Iodine based ointment, Non-staining.

iii) Diadermic ointment: which is well absorbed from the skin & has systemic effects.
eg: Nitroglycerine ointment.

6. Ocuserts:

- They work as membrane controlled delivery system.
- They contain a drug reservoir sandwiched b/w the two layers of ethylene vinyl acetate & release drug at frequent interval.
- Reservoir is surrounded by white titanium dioxide ring which helps in visibility.
- They are placed in lower eyelid & action lasts for 7-10 days.
- Ocuserts are expensive and irritative.
eg: Pilocarpine.

Exp. No. -14

Expt. No. _____

POTASSIUM PERMANGNATE LOTION.

Aim:- To prescribe, prepare & dispense 60 ml of 1:5,000 Condy's Lotion for a patient for use as a mouth gargle (suffering from Gingivitis).

Ingredients :

Potassium permanganate
water upto

G or ml

0	012
60	0

Calculation:

5000 ml contain 1 G or 1000 mg of $KMnO_4$.

1 ml contain $\frac{1000}{5000}$ mg of $KMnO_4$.

60 ml contain $\frac{1000}{5000} \times 60$.

= 12 mg of $KMnO_4$.

60 ml ~ 12 mg.

Method of preparation :-

1. Minimum quantity that can be weighed on dispensing balance is 50 mg. $\therefore$ weight 60 mg and dissolve in 10 ml of distilled water in a glass beaker. This will give 6 mg/ml of $KMnO_4$. Now take 2 ml of this solution and dilute with distilled water upto 60 ml. Now dispense 60 ml solution in a beaker amber coloured bottle to avoid exposure to light.
60 mg $\rightarrow$ 10 ml $\rightarrow$ 6 mg/ml $\rightarrow$ 2 ml add 50 ml of distilled water up to 60 ml

Teacher's Signature : _____

PRESCRIPTION :

For
Mr XYZ
Age:
Address:
Hospital No:

Dr ABC
MBBS
Address:
Date:

Rx

potassium permanganate
water upto

G or ml	
0	012
60	0

Mix and prepare lotion.

Gargle ~~it~~ with it 3 times a day in between meals.

ABC
Reg. No. XXX

LABEL :

POTASSIUM PERMANGNATE LOTION	
for Mr. XYZ	
Direction: Gargle $\bar{c}$ 3 times a day in between meals.	
Date:	Per
GMCJ PHARMACY LAB	

Expt. No. _____

2. Prepⁿ of stock solution:

stock solution contains 100mg of KMnO_4 in 100 ml solⁿ.
weight 100mg of KMnO_4 crystals. & finally grind them in a glass pestle and mortar (KMnO_4 contains porcelain).
Add about 20 ml of water to it & transfer the contents to a measuring cylinder & make up the vol to 100 ml, then take 12 ml of this solⁿ and make up to the volume to 60 ml & dispense this in a amber coloured bottle.

Q.1. What is a lotion?

A: Lotion is a liq. prepⁿ containing medicinal ingredients meant for local action & usually used externally. They include eye wash, mouth wash, gargle, solution for urethral and vaginal irrigation. They are applied with out rubbing. They have soothing & protective property and act as antiseptic, astringent and anti-pruritic agents.

Q.2. How does KMnO_4 lotion act?

A: KMnO_4 is a strong oxidising agent & it acts by liberating oxygen that oxidises the protoplasm of micro-organism producing germicidal agents. It also has disinfectant and deodorant property.

Q.3. What are the uses of Condy's lotion?

A: i) 1:4000 to 1:10,000 solution (Condy's lotion) is used for gargling (obsolet; better chemicals like chlorhexidine mouth wash) directing, irritating

Teacher's Signature: _____

Vaginal and urethral cavity. and as a wet dressing and baths for acute dermatosis with 2° infection, weeping eczema.

- i) 1% solution has been used in mycotic infection such as athlete's foot & poison by dermatitis.
- ii) 0.02% solⁿ is used for gastric lavage in morphin & opium poisoning (except atropine & cocaine which are not efficiently oxidised).
- iv) Crystalline insufflation of $KMnO_4$ has been employed topically to oxidise venom in snake bite and scorpion bite.
- v) It is commonly employed to purify well water & to disinfect vegetable and fruit.
- vi) 5% solution has powerful styptic action.
- vii) Washing utensils in mass gatherings.

Q.4 What are the toxic effect of $KMnO_4$?

A: Ingestion of $KMnO_4$ may provide severe gastrointestinal irritation & also cardiac vascular depression & kidney damage.

The action is rather store & higher concⁿ causes burn & blistering therefore declining the popularity may lead to oedematous buccal mucous membrane. causes discolouration of steel instruments promote rusting of surgical instruments.

Q.5 Why amber coloured bottles are used to dispense $KMnO_4$ lotion?
A: When sunlight falls on the solⁿ of $KMnO_4$ it gets reduced

Expt. No. _____

Page No. 97

by liberating O_2 , thus its oxidising property is lost.

Q.6. Why is this lotion called Condy's lotion?

A: Condy's lotion has derived this name from a German chemist Henry Bollmann Condy. He marketed several products & pretended the use of $KMnO_4$ in his permission.

Q.7. What is antiseptic?

A: They are used to kill microorganism, excluding spores, it can be applied on skin to prevent infection.

Q.8. What is disinfection?

A: Disinfectants are the substances which is used to kill the micro-organisms from objects over surface excluding spores, it doesnot applied to skin, it used in floor wall, clothes etc.

Q.9. Advantages of stock solution?

A:

- saves the patient time.
- conserve material
- Reduce storage space
- Improved accuracy with working lower concⁿ is prepared serves cost.
- Gargle 10 min. before gargle $1/2$ hr take.

Teacher's Signature : _____

Mandl's throat paint

Aim:- Prescribe, prepare & dispense 10 ml of Mandl's throat paint to a patient suffering from tonsillitis.

Ingredients:

	G or ml	
Mandl's paint		5
Iodine	0	125
Potassium Iodide	0	25
Distilled water	0	25
Oil of peppermint	0	0.4
Alcohol (90.1.)	0	4
Glycerine upto	10	0

Procedure:

~~0.025~~ 0.25 gms of KI is dissolved in 0.25 ml of distilled water in a glass mortar/heaker. 0.125 gms of powdered iodine is added to this solⁿ & dissolved. 0.4 ml of 90.1. alcohol is added to the solⁿ. Glycerine is added to prepare vol. of the throat paint upto 10 ml. 0.04 ml (1 drop) of oil of peppermint added mixed well. Contents of the glass mortar/heaker are transferred to a bottle and dispensed.

Method of application:

The patient's ~~patient~~ paint should be applied in the throat using a cotton swab. Patient should be instructed, not to take any food or water before & after application of throat paint. In children, a few drops of the paint are to be

Teacher's Signature: _____

PRESCRIPTION:

Dr. ABC

MBBS

Address:

Date:

For

Mr. XYZ

Age

Add:-

Hospital No. -

Rx

Iodine
Potassium Iodide
Distilled water
oil of peppermint
Alcohol (90%)
Glycerine upto

G or ml	
0	125
0	25
0	25
0	04
0	4
10	0

Mix & prepare paint.

Apply Mandl's paint 3 times daily (in between ^{meals} ~~meals~~).
Using cotton swab.

Caution: Not to be taken in.

ABC

Reg. No. xxx

LABEL

MANDL'S PAINT
Not to be taken in
For Mr. XYZ
Directions To be applied on the throat 3 times daily (in ^{meals} meals) using cotton swab.
Date: 10/03/15
PQR
GMCJ PHARMACY LAB.

put in the mouth and all to be swallowed (i.e. over tongue.)

Q.1. Define paint?

A: It is a liq. prepⁿ meant for local application to the mucous membrane or skin.

Q.2. What are the uses of Mandl's paint?

A: It is used for local application in cases of tonsillitis and pharyngitis.

Q.3. What are the actions & uses of individual ingredients?

A: Iodine: It is solid non-metallic element obtained from naturally occurring iodides & iodates. It occurs in the form of bluish, black, brittle rhombic prism or plates with a metallic lustre and ~~distinctive~~ distinctive penetrating odour & acid taste. It is slightly soluble in water but freely soluble in an aq. solution containing soluble iodides. It is soluble in alcohol and glycerine. It has property of iodising & oxidising bacterial protoplasm. The proteins are denatured and coagulated. It is an effective fungicide.

Potassium iodide: It is used to dissolve iodine. It is antiseptic.

Glycerine: It is hygroscopic. It adheres to the mucous membrane and helps to prolong the action of iodine.

Teacher's Signature : _____

Alcohol: It is antiseptic and preservative. It uses the solubility of the paint.

Oil of peppermint: It is used as flavouring agent.

Q. Tabulated some diff. types of paints & other tissue.

A. Tincture iodine: unbroken skin, small abrasions, & wounds.

Mandil's throat paint: Tonsillitis, pharyngitis.

Boroglycerine paint: Aphthous ulcer, stomatitis, glossitis.

Tannic & glycerine paint: Bleeding gums.

Gentian violet paint: Bed sores, furunculosis.

Tannic acid & fannous

It is present in many plant but is generally obtained from natural beetle nut. etc. They denature protein forming tannate. Uses: Bleeding gums as glycerine of tannic acid.

Bleeding piles: As tannic acid suppositories alkalisied

poisoning precipitates. Suggested as singested as formalin (It is use in burns has been absorbed because it forms a crust under which bacteria could grow sufficient, systemic absorption often occurred to cause antifibrinogen lobules mucosa in liver.

Gentian & violet: crystal violet

A resoriline dye active against staphylococci, other gram +ve bacteria and fungi, but gram +ve organism X-mycobacteria all insensitive. Ag or Alcoholic solⁿ (0.5-1%) is used on.

Furunculosis bed sores, chronic ulcer, infested ulcers,

Expt. No. _____

Page No. 103

val conditions Vincent's angina. It has become unpopular due to deep staining.

Demulcents - are inert subs. which with sooth inflamed eroded mucosa skin by preventing contact with a irritants in the surrounding. They are high molecular alt subs. & are applied on thick colloid used solⁿ into water. eg: Gum acacia, Gum tragacanth, Glycerine.

Emollient: are blood oily subs. which sooth and softens skin. They form occlusive film over the skin, prevent evaporation, thus reforming elasticity of cracked. eg: dry skin, eg: olive oil, aractus oil, sesam bil, coco butter.

Pigmentum: Coloured paint are called pigmentum like Mandi's paint (so named after the person who discovered it.) All coloured paint. Gentian violet paint, Mandi's paint etc.

Q. What is thyroid storm (thyrotoxic crises) ?

A: This is a manifestation of severe hypermetabolic state due to very high level of circulating thyroid hormone. Besides the usual features of hypothyroidism. This is characterised by hyperpyrexia cardiac arrhythmia (arterial fibrillation/nausea, vomiting, diarrhoea, & mental confusion. It is usually precipitated by trauma, surgery, diabetic etc.

Teacher's Signature : _____

Q. What are the diagnostic uses of Iodine?

A: They are used to treat hyperthyroidism pre operative prepⁿ for thyroidectomy in goitres also. Thyroid storm. Lugol's Iodine or Iodine containing ratio. Contrast media used to stop any further release of T_3/T_4 prophylaxis of endemic goiter.

Antiseptic - Tincture iodine, povidone iodine etc.

Q. What are the beneficial effect of Iodophore?

A: Povidone Iodine (Iodophores).

Non-irritation, non-toxic, non-staining are exact. prolonged germicidal effect.

Used on body, furunculosis, burns, otitis, external ulcer, Trichomonal, non-specific vaginitis, & few surgical & solubility, eardrops by instruments.

Astringents which ppt protein but not penetrates into skin. eg: Tannic acid & Tannins.

mineral astringent - Alum, Heavy metal like Al, Zn

Alcohol - Ethanol

Glycerine - Emollient, demulcent, ethema glycora.

Expt. No. _____

TINCTURE IODINE

Aim:- Prescribe, prepare & dispense tincture iodine for a patient having abrasion on skin.

Ingredients:

	G or ml	
Iodine	0	250
Potassium Iodide	0	250
Purified water	0	25
Alcohol (90%) upto	10	0

Method of preparation:

Take the weighed quantities of Iodine & potassium iodide in a beaker. Add 0.25 ml of purified water & dissolve it. Then add 90% of Alcohol upto 10 ml.

Q Define Tincture?

A: Tincture are alcoholic or hydroalcoholic extractive prepⁿ of plant & crude drugs. The strength of potent drug in tincture 10% & in non-potent drug in tincture is 20%.

Tincture are of 2 types:

External - Tincture Iodine.

Internal - Tincture opium, tincture Belladonna, tincture Cardamom.

Tincture opium - Mainly contains morphine. mainly used in pain & acute diarrhoea but not in cases of poisoning.

Tincture Belladonna - Used in abdominal colic.

Tincture Cardamom - flavouring agent.

Teacher's Signature : _____

PRESCRIPTION:

for

Mr. XYZ

Age

Sex

Add.

Hospital No.

Dr. ABC

MBBS

Address:

Date:

Rx

Iodine

potassium iodide

purified water

Alcohol (90%) upto

G or ml.

0 25

0 25

0 25

10 0

Mix and prepare paint.

To be apply on the affected part once a day
by a cotton swab.

ABC

Reg. No. XXX

LABEL:

TINCTURE IODINE PAINT

FOR EXTERNAL USE ONLY

For Mr. XYZ

Direction: Apply in the affected part
once a day by cotton swab.

Date:

PER

GMCS PHARMACY LAB

Expt. No. _____

Q.2 Why potassium iodide is added?

A: KI helps in dissolving ^{& form a complex} iodine (I_2). It forms a complex with iodide which is water soluble. It has antiseptic properties & act as a adjuvant.

Q.3 What is the mechanism of action of Iodine?

A: Iodine is a rapidly acting, broad spectrum (bacteria, fungi, virus), ^{anti}microbial agent and act by iodinating and oxidising microbial protoplasm.

Q.4 What are the uses of Tincture Iodine?

A: - Abrasions and small cuts
- for degerming skin before surgery
- for sterilising surgical instrument.

Q.5 What is the uses of I_2 ?

I) Locally as an Antiseptic & disinfectant.

(a) Tincture iodine:- for small abrasion cut, for unbroken skin & wound.

(b) Weak Iodine solⁿ is used for degerming of skin properties.

(c) Iodine ointment used externally for t/t of ringworms.

(d) Iodine crystals: used to sterilise water particularly during hiking, expenditure & for soaking vegetable to disinfect them before consumption.

(e) 1:20,000 solution is Bactericidal in 1 min, and kills spores in 15 min.

(f) Iodine ointment - used externally in treatment of ring worm.

Teacher's Signature: _____

① Iodinated hydroxyquinolines - used in treatment of amoebiasis & as topical antifungal agents.

Iodine Glycerine prepⁿ (Mandil's paint) is applied to mucous membrane in treatment of pharyngitis & follicular tonsillitis.

II) In endocrine disturbances:

- Prophylaxis of endemic goitre as 'Iodized salt'.
- Pre and post-operative to thyroidectomy.
- In the management of Grave's disease.

III) As a radioactive isotopes:

- I-131 is used in Ht of Grave's disease & toxic multinodular goiter & some type of thyroid cancer that absorb iodine. e.g. papillary thyroid carcinoma.
- I-125 emits γ -radiation & used in functional assay of thyroid gland.

IV) As a radiocontrast medium in perfusion study of organ in kidney, liver & evaluation of uterus in fallopian tube.
e.g. - Sodium Iodate, Iodoxyl, Ioponoic acid.

V) As a expectorant or ~~mucolytic~~ mucokinetic - potassium iodine is used.

vi) As chemical antisept in alkaloid poisoning for sterilising surgical instruments.

Expt. No. _____

VII) During colposcopy; Lugol's Iodine is applied to vagina and cervix, normal vaginal tissue stain brown owing to its high glycogen content discolouration (a colour reaction similar to that with starch) while abnormal tissue suspicious with cancer does not stain & thus appears ~~more~~ pale compared to the surrounding tissue. biopsy of suspicious tissue can then be performed. This is called Schiller's test.

VIII) As a gram's Iodine in gram stain.

IX) Excess Iodide inhibit its own transport in thyroid cell. used of KI or Lugol's iodide thus help in decreasing I-131 uptake in nuclear fall out in which case, I-131 is a fission product.

Q. What are the toxic effects of iodine?

Q. What are the diff. prepⁿ of Iodine?

Q. Describe treatment of thyroid storm.

→ Some oxidising agents:

- Potassium permanganate
- Hydrogen peroxide
- Benzoyl peroxide
- Iodine
- Chlorine
- Bleaching powder.

Teacher's Signature : _____

Expt. No. _____

Exp. No. - 17

Page No. _____

111

BOROGLYCERINE PAINT

Aim:- Prescribe, prepare & dispense boroglycerine paint for a patient suffering from Aphthous ulcer.

Ingredients:-

	G	or ml
Boric acid	3	0
glycerine upto	10	0

Method:-

Take 3ml of boric acid in mortar & pestle and mixed with 5ml of glycerine. Then make the final vol. upto 10ml in a measuring cylinder. by the remaining glycerine. Transfer it into dispensing bottles, label it & dispense.

Q.1. What is paint and what are the diff. types of paints you know?

A: Paint is a liq. prepⁿ, intended for application of the skin or mucous membrane.

Q.2. What are the uses of Boroglycerine paint?

A: Boroglycerine paint is used in stomatitis (inflammation of oral cavity including lips) and Glossitis (inflammation of tongue).

Q.3. How does Boric acid in different percentage?

A: Boric acid is a Bacteriostatic and a very weak antiseptic and non-irritating.

Uses:- 1) Aq. solⁿ (4%) is used for irrigating eye as eye wash.

mouth wash, skin lotion & vaginal douches etc.

Teacher's Signature: _____

PRESCRIPTION :-

Dr ABC
MBBS
Address:
Date:

For, Mr. XYZ
Age
Address:
Hospital No. -

Rx

Boric acid
glycerine upto

G or ml.	
3	0
10	0

Mix & prepare paint.

To be applied on the ulcer thrice a day.
in between two meals using cotton swab.

ABC
Reg. No. XXX

LABEL:

BOROGLYCERINE PAINT
FOR EXTERNAL USE ONLY

For Mr. XYZ

Direction:- To be applied on the ulcer 3
times a day in b/w the meals using cotton
swab.

Date: _____

PCR

GMCJ PHARMACY LAB

Expt. No. _____

Page No. 113

- i) 10% ointment (Borograde) - cuts & abrasion - antiseptic
- ii) Boroglycerine paint (30:1) - in stomatitis & glossitis.
- iv) as dusting powder when mixed with starch, talc & zinc oxide.
- v) insecticidal; termites, ants,
- vi) lubricants; as carboxen powder.

Q.4. What are the toxic effect of boric acid?

A: systemic absorption causes vomiting, abdominal pain, diarrhoea, visual disturbances & kidney damages & hence its use for irrigating bladder & ointment over extensive burn area and liberal use of powder is not recommended.

preparation:

1. Boric talc dusting powder contains:

Boric acid	:	2.3 gm
starch	:	5.0 gm
talc (sterilised)	:	50 gm

2. Boric acid eye lotion:

it contains 3.4 gm boric acid dissolve in 100 ml of freshly boiled & cooled purified water.

3. Borax glycerine:

This contains 12% (w/v) borax in glycerine & is used for painting throat & tongue in children.

Teacher's Signature : _____

in cerebral oedema to 1 ICP.

1 - 1.5 gm/kg (Infant dose 120 gm/day) as 50-70% 80%.

10% in NS or D-5 given I.V. dose 1.2 g/kg body wt

• As a sweetening & flavouring agent.

• Pharyngeal oedema: Soothe the throat & reduce afferent impulse from the inflamed irritated pharyngeal mucosa. Thus provide relief in dry cough arising from throat.

Topical uses:

- As a hygroscopic agent along with magnesium sulphate as dressing for wounds, ulcers, abscesses. effect also stimulate rectal contractions.

- as an emollient.

gn-vitro use

- as a vehicle for drug.

- Rectal suppository

3 gm for adult, 1-1.5 gm for children

- act by osmotic effect & also stimulate rectal contraction.

Date

Expt. No.

Page No. 115

Q. Define pain, enumerate diff. pain preparation.

Q. Indication of vaginal douching.

OINTMENT (Ungentum)

Ointment is a semisolid preparation consisting of medicament or mixture of medicament dissolved or dispersed in bases of animal, mineral or synthetic origin.

Functions:

- They serve as vehicle for topical application of medicaments.
- Acts as protective agent for skin.
- Emmolient action.

Classification:

Class-I : oint. prepared by fusion

eg:- Simple ointment

Class II : ointment emulsion.

eg:- Wool fat emulsion

Wool alcohol emulsion.

Class III : ointment prepared by trituration,

eg:- Sulphur ointment.

ZnO ointment.

Class IV : Miscellaneous

eg:- Iodine ointment.

OR

epidermic ointment: Whitfield's

Endodermic ——— : Non-staining iodine ointment

Diadermic ——— : Nitroglycerine ointment.

Common ointment bases:

- Hydrocarbon bases (protective bases)
 - Hard paraffin
 - Soft paraffin
 - paraffin ointment
- Animal bases (penetration bases)
 - Bees wax,
 - Lanol.
- Wool fat bases:
 - anhy. wool fat or anhy. lanolin
 - Hydrous wool fat. lanolin.
- water miscible bases (washable bases)
 - aq. creams.

Method of prepⁿ of ointment:

- Trituration method
Levigation.
- Fusion method

melting point

Bees wax	62° - 64°
Hard paraffin	58° - 56°
Soft paraffin	38° - 54°
Wool fat	34° - 40°

Selection of base of ointment:

1. Degree of absorption required.
2. Stability.
3. Solvent properties.

Date

Expt. No.

Page No. 119

4. emulsifying property.

5. consistency.

6. eye ointment (oculent)

7. paste

Expt. No. _____

Exp. No. - 18

Page No. 121

WHITFIELD'S OINTMENT

Aims: - To prescribe, prepare & dispense 25 gms of whitfield's ointment.

Ingredients:-	G or ml.	
Benzoic acid	1	5
Salicylic acid	0	75
Vaseline	22	75

Method of preparation:-

1. Weigh salicylic acid & benzoic acid each.
2. Triturate them in the portion of vaseline on a tile until smooth.
3. Gradually add more vaseline until the weight becomes 25 gms.
4. Dispense in a wax paper.
5. Label the packet & dispense it.

Q: What are the functions of the various ingredients of this ointment?

A: Benzoic acid : It has anti-bacterial, anti-fungal & preservative property for food.

Salicylic acid : It has bacteriostatic, fungicidal & keratolytic property.

Simple ointment : It acts as vehicle which is hydro-carbon based. Used for superficial penetration of the skin.

Teacher's Signature : _____

PRESCRIPTION:

Dr ABC
MBBS
Address:
Date:

Δ: Tinea corporis

For: Mr XYZ
Age/sex
Address:
Hospital No.

R_x

Benzoic acid
Salicylic acid
Vaseline

G or ml	
1	5
0	75
22	75

Mixed to make a mixture unguentum & send one such.
Instruction: To clean the affected part w soap & water.
Apply the ointment on the affected part 2 times a day

Sign(ABC)
Ref. No. XXX

LABEL:

WHITFIELD'S OINTMENT
for external use only.

To be applied over the affected part of skin 5 times a day after cleansing the affected part w soap & water.

Date:

Dispensed by
Sign. & Date

GMEI PHARMACY LAB

Expt. No. _____

Q.2. What are the uses of Whitfield's ointment?

A: • Whitfield's ointment is an ointment containing benzoic acid & salicylic acid in the ratio of 2:1. It combines the fungistatic action of benzoate & the keratolytic action of salicylate & is used mainly in the Rx of superficial infections like ringworm, tinea versicolor etc.

• The keratolytic action of salicylic acid accelerates desquamation & promotes penetration of benzoic acid into the lesion. So, if conc. of salicylic acid is more it is used in Rx of warts & corns.

• It is also used in the Rx of psoriasis & eczema.

Q.3. Name some other anti-fungal agents for the Rx of superficial fungal infection.

Q.4. How do eye ointments differ from other ointments?

Q.5. Prepare a list of ointments available in market along with their ingredients and therapeutic uses.

~~Complete assignment~~

Teacher's Signature : _____

Expt. No. _____

Exp. No. - 19

Page No. 125

SULPHUR OINTMENT

Aim: Prescribe, prepare & dispense 10 gms of sulphur ointments (10%) for a patient suffering from scabies.

Ingredients:

	G or ml
Sublimed sulphur finely powdered	10
Simple ointment	90

Simple ointment

B.P. Composition I.V. Composition

		G or ml
Wool fat	50 gm	0.5
Hard paraffin	50 gm	1.0
Cetostearyl alcohol	50 gm	-
White soft paraffin	150 gm	8.5
or Yellow soft paraffin		

Method of preparation:

Ointment should be made in 2 stages.

Stage - I. Prepⁿ of simple ointment

It is prepared by fusion method.

Take a porcelain dish & place it on a water bath (the dish must be in direct contact with boiling water so that temp. of both remain same). Put the ingredients in the dish in the descending order of the M.P. i.e. first hard paraffin (highest M.P.) when it has melted

Teacher's Signature: _____

PRESCRIPTION:

Dr. ABC
MBBS, MD
Address
Date:

For:
Mr XYZ
Age
Add.-
Hospital No.

Rx

sublime sulphur finely powdered
simple ointment

G or ml	
1	0
9	0

Mix & prepare ointment.

Directions: To be applied all over the body (below neck) for three consecutive days, after a warm scrubbing bath followed by soap & water bath on 4th day.
[particular attention: webs of finger & toes].

ABC.

Reg. No. xxx

LABEL

SULPHUR OINTMENT	
for external use only	
For: Mr. XYZ	
Direction: To be applied all over the body (below neck) for 3 consecutive days after a warm scrub bath followed by soap & water bath on 4th day.	
Date:	PCR
GMCT PHARMACY LAB	

Expt. No. _____

put yellow soft paraffin (lower m.p.) in it & lastly put wool fat (lowest m.p.) in it. when the matter has melted thoroughly remove the dish & allow it to cool. stirring all the while to make an uniform ointment.

stage-II : Preparation of sulphur ointment.
It is prepared by levigation (that is trituration of ingredients).

Take the required quantity of sulphur powder & crush it into the fine particles, transfer it into the centre of pill tile. Now take the required quantity of simple ointment & put it on one side of the tile. Take the base about 3 times the weight of sulphur powder.

Triturate the whole powder quantity of the powder & the base to make a uniform ointment. Now triturate this ointment & the remaining base taking some quantity of the at a time. Pack it in a wax paper & pack this folded packet in another sheet of white paper, label & dispense it.

- Q. Name the causative agent of scabies.
- Q. Describe the sites of predilection of lesions of (scabies) in adults & infants.
- Q. What is Norwegiam or ~~scrobbled~~ crushed scabies.
- Q. Differentiate b/w ointment & paste?

Teacher's Signature : _____

* Drugs apart from sulphur ointment which kills ectoparasites :-

1. Permethrin
2. Lindane
3. Benzyl benzoate
4. Crotonitron
5. Ivermectin.

Expt. No. _____

Exp. No. - 20

Page No. 129

PARENTAL DOSAGE

1. Parenteral dosage formulation:-

Parenteral ~~via~~ route is used for medications entering the body through any other route other than oral or gastrointestinal system & commonly refers to subcutaneous (SC), Intramuscular (IM), Intradermal (ID), Intravenously and Inhalational routes. Other parenteral route are used less commonly. As the drugs directly enter the systemic circulation they should be given with care taking all aseptic precautions. Drugs administered by these usually have a faster onset of action as the drug enters into the body fluid or blood supply directly.

Indications:-

These route are suitable for if:-

1. Drug is poorly absorbed by gastrointestinal tract.
2. Drug is inactivated by the digestive juices or degraded by first pass metabolism.
3. patient is unable to take or tolerate the drug orally due to nausea, vomiting or unconsciousness.
4. Rapid onset of action is required.

Advantages:-

1. Action is faster & predictable which is required in emergencies.
2. Gastric irritation & vomiting are not provoked.
3. Can be employed in unconsciousness, uncooperative patients or in patients with persistent vomiting.

Teacher's Signature : _____

4. No chances of interference by intestinal or digestive juices.
5. Metabolism of the drug by liver is bypassed.

Disadvantages:

1. Preparation has to be sterilised.
2. Expensive
3. Techniques are invasive & painful.
4. Assistance of another person is mostly needed (except SC injection). Self medication is difficult.
5. There are chances of local tissue injury, nerve injury, abscess formation, lipodystrophy & tissue necrosis.
6. As it directly enters systemic circulation, chances of toxicity are more.
7. Patient may require monitoring, especially with intravenous route, as adverse events occur quickly & the drug can't be withdrawn once injected.

Expt. No. _____

2. Parenteral fluids & Infusions:

Definition: When fluid in excess of 100 ml is given by IV route, it is called Intravenous infusion.

Indications:

1. Hypovolemia like in haemorrhage, burns, diarrhoea, vomiting etc.
2. When patient is unconscious, uncooperative or severely debilitated.
3. For a sustained action when plasma $t_{1/2}$ of a drug is very short.

Advantages:

1. Immediate action.
2. Action discontinued when infusion is stopped.
3. For an assured administration of drug.

Classification of Parenteral fluids:

1. Natural
2. Synthetic

3. i) Natural

It may be in the form of whole blood, plasma, packed red cells, human serum albumin etc.

Blood:

Blood may be obtained from human donors by aseptic technique, which is preserved in either

Teacher's Signature : _____

Citrate-phosphate-dextrose (CPD) or Citrate-phosphate-dextrose-adenine (CPDA). The blood is stored between $2-6^{\circ}\text{C}$. Compatibility test for ABO & Rh group is carried out before transfusing blood.

Indications:-

- i) acute haemorrhage
- ii) severe anaemia
- iii) Other haematological disorders like agranulocytosis.
- iv) Miscellaneous to supply antibodies, protein deficiency.

Complications:

Pyrexia, allergic reacⁿ, air embolism, myocardial failure, transfusion of disease, haemolytic reacⁿ (Mismatch), hyperkalemia, iron overload, citrate intoxication.

Packed cell preparation:

This is made by removal of 40% of super supernatant plasma. It uses oxygen carrying capacity of the blood without using its volume.

Plasma:

Plasma is the cell free portion of anticoagulated blood. It is available as fresh plasma & fresh frozen plasma. It contains all the stable proteins & the coagulation factors. It is used to treat or prevent bleeding due to deficiency of coagulation factors.

A
complete value
14

3.

ii) Synthetic Colloids & Crystalloids.

Colloids:

They are substance with ~~already~~ relatively high molecular weight which when infused in blood stream, remain there long enough to augment the volume of the circulatory fluid by increasing the oncotic pressure, eg. - Dextran 40, Dextran-70, hydroxyl ethyl starches, polyvinyl pyrrolidone, gelatine polymers (poly-geline) etc.

Dextran:

- Oncotic pressure similar to plasma proteins,
- Half life : 24 hrs.
- Inhibits thrombus formation, antisludging effect on blood and so may improve microcirculation.
- They coat platelets and coagulation factors & may interfere with their function. It may thus cause haemorrhage.

Features of a colloid:

- High molecular weight
- Cannot cross capillary wall so remain inside capillary.
- Tries to draw ECF into capillary to maintain osmotic pressure.
- Perfusion of tissue is good.
- Not quickly metabolised, not filtered by kidneys, not precipitated into the blood stream.

Teacher's Signature : _____

- Has no pharmacological ~~ly~~ action of its own.

4.

Crystalloids:

They have low molecular weight & so are able to cross the capillary wall.

Dextrose:

- It is the form of 5, 10, 20, 25, 50%. Sugar + water.
- When glucose metabolism is increased & this solution is equivalent to administration of water alone.
- Its osmolarity is lower than that of serum, so it is not ~~option~~ ~~for~~ optimum for volume replacement.

Indications:

- Dehydration
- Pre & post operative patients when oral intake of food & water is limited.
- Ketosis, diarrhoea, vomiting, starvation.
- Hyponatremia.
- As a vehicle for drugs.
- As a nutrient.
- Hypercalcaemia.

Disadvantages:

- Hypocalcaemia
- Hyperglycaemia & hyperinsulinemia in diabetics.
- Water intoxication.
- Dehydration.

Expt. No. _____

⑤ Isotonic Normal saline (0.9% NaCl) :

Osmolarity matches that of serum, good fluid for volume replacement.

Indications:

- alkalosis with fluid loss.
- salt depletion - along with fluid loss as in diarrhoea, vomiting, sweating.
- low salt syndrome as in heart failure, renal impairment
- to initiate or terminate blood transfusion.

Disadvantages:

- Hyponatremia
- acidosis
- Hypokalemia
- circulatory overload.

⑥ Ringer lactate ($\text{Na}, \text{K}, \text{CaCl}_2, \text{Cl}, \text{HCO}_3$)

- isotonic
- composition same as extracellular fluid.
- very effective to replace fluid loss in patients of burns & diarrhoea.

Indications:

- Burns, infection, fractures peritoneal irrigation.
- Moderate metabolic acidosis - mild renal insufficiency
- Infant diarrhoea, diabetic ketosis.

Teacher's Signature : _____

- ~~g~~ In diabetics to provide κ to extracellular fluid.

Dextrose Normal saline (DNS) : 5% Dextrose + N.S. (0.9% NaCl)

Indications:

- burn.
- shock due to hypovolemia.
- as an initial hydrating solution when renal function is not established.
- calories & chloride loss more or equal to sodium loss.

⑦ Parenteral route of drug administration:

i) Intradermal:

The drug is injected directed into the outer layer of skin raising a bleb. It is most commonly used to test patient's sensitivity to an allergen or for diagnostic testing of tuberculosis.

Needle - 26 G

Length - 12 mm.

Syringe - Tuberculin syringe.

Site of injection - Antero-medial surface of forearm.

- Amount should be small.

- Absorption is slow.

eg: Mantoux test, allergic sensitivity testing, BCG vaccination.

Expt. No.

⑧ To calculate dose:

$$\text{Drops/min} = \frac{\text{flow rate of set}}{60} \times \text{total vol. of fluid to be administered.}$$

Method of administration of parenteral Infusions:

- Wash hands
- Reassure & explain.
- select a proper vein & make it prominent by applying a tourniquet.
- Disinfect the skin with spirit.
- pull the skin in longitudinal direction of vein.
- insert the needle at an angle of 35 degree.
- puncture the skin, move the needle horizontally in vein,
- slowly aspirate blood.
- loosen the tourniquet.
- Inject slowly, fix the needle.
- check for pain, swelling & haematoma.
- Adjust the flow rate as required.
- After injection, remove the needle, press cotton, dispose the waste safely.
- secure & adhesive tape.

Hazards of parenteral administration:

- pyrogenic reaction: due to old solution.
- pulmonary embolism.
- pulmonary oedema: in case of rapid infusion.
- Thrombophlebitis due to injury.
- Circulatory overload: that may lead to CHF.

Teacher's Signature:

Expt. No.

6. Always check the label including expiry date.
7. Make sure that the injection contains proper drug in proper strength.
8. Only compatible drugs should be mixed, if necessary.
9. Never return unused drug to stock bottle.
10. Avoid needle prick injury.
11. Destroy needle & syringe safely. Disposable syringes and needles should not be reused.

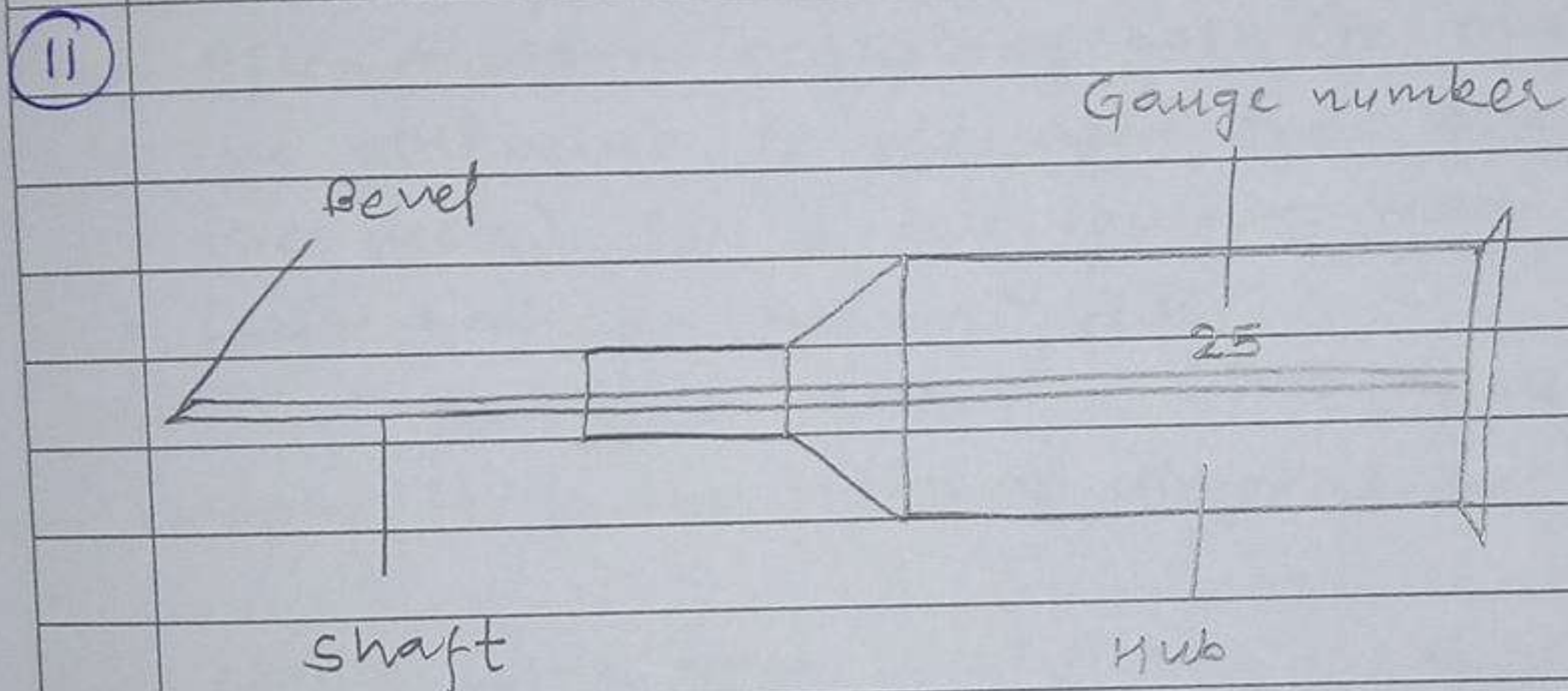


Figure:- Parts of the needle.

(12) Techniques in parenteral administration of drugs:

Withdrawal of drug from ~~capsules~~ ampoule:

1. Syringe and needle should be empty.
2. Wash hands.
3. Put needle on syringe, without their tips.
4. Filp the neck of ampoule.
5. Break it & split it off.

Teacher's Signature : _____

6. Aspirate drug from ampoule.
7. Remove air from the syringe.
8. Administration the drug.
9. Dispose syringe & needle.
10. Wash hands.

Assignments on sulphur ointment

Q.1. What are the ^{uses} of sulphur ointment?

- Ans -
1. for scabies.
 2. chronic skin condition, psoriasis, seborrhoea.
 3. for fungal infection of skin.
 4. oral sulphur product laxative effect.

Q.2. How is sulphur ointment applied & when?

Ans - After a warm scrubbing bath (to open the burrows) the ointment is massaged over the entire body (below the neck) for 3 consecutive days followed by soap water bath on the 4th day.

particular attention while applying ointment is to apply it to the webs of finger & toes.

Q.3. Name some other scabicide drug?

Ans -

- Ascabiol or Benzyl benzoate (25%) solⁿ.

After proper bath patient's body should be allowed to dry & the solⁿ should be applied from the toe to neck for 3 days.

- A Crotoen or crotamiton (10%) cream & lotion. Apply all over the body below the chin full by 2nd application after 24 hrs. & a series bath 48 hrs. after 1st application.

- Mitigal or Mesulphur (Dimethyl thioanture). It is used as a 10% solⁿ in liq. paraffin. for 3 night.

Teacher's Signature : _____

- a Gamma benzene hexachloride (BHC lindane). It is used as cream or lotion. After bath for 3 days.

Q.4. What is M.O.A. of the sulphur?
It is a potent scabicide & weaker pediculicide, antiseptic fungicide & keratolytic.

Applied to skin it is slowly reduced to H_2S oxidised, to SO_2 & pentathionic acid. These specially the latter dissolves the cuticle of itch mite, & kill it. The reactions are carried out by epidermal cell & the arthropods themselves.

Q.5. What are the disadvantages of sulphur ointment.

- Treatment is messy.
- Irritant in nature. So, should not be applied to the face.
- Produces bad odour.
- Stains the cloth.
- Repeated application are required.

Q.6. What are the uses of each ingredients?

Ans: Sulphur
Wool fat: It is emollient & resembles sebaceous secretion of skin.

Soft paraffin: It forms an emulsion in water. It is readily absorbed. It acts as an emollient.

It forms the base in the preparation of the ointment.

Date

Expt. No.

Page No.

Hard paraffin : It helps in maintaining the consistency of the ointment.

Cetostearyl alcohol : It is a water repellent.

B^{plus}

04/02/18