SUMMER – 13 EXAMINATION

Subject Code: **811** **Model Answer** Page No: __1__/ N

Important Instructions to examiners:

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

Q.1 Attempt any EIGHT (2marks each)

a) Give metric equivalent (1/2 mark for each)

i) One pint = 600ml

ii)One fluid ounce = 30ml

iii) One pound = 450gm

iv)One minim= 0.06ml

b) Incompatibility:-

Incompatibility occurs as a result of two or more antagonistic substances & an undesirable product is formed which may affect the safety, efficacy & appearance of the pharmaceutical preparation .

----- (1/2 mark)

Types of incompatibility:- ((1 and1/2 mark)

1)Physical incompatibility

2)Chemical incompatibility

3)Therapeutic incompatibility

c) Dose of drug for child=

$$\frac{\text{Weight in Lb}}{150} \times \text{Adult dose}$$ ------(1 mark for formula)

$$= \frac{30}{150} \times 200$$ ----------(1/2 mark)

= 40mg ----------(1/2 mark)

d) Simple syrup I.P. is considered self preservative because:-

Simple syrup I.P. contains 66.7%w/v sucrose which having high osmotic pressure(1 mark) which prevent the growth of micro-organisms & also having antioxidant(1 mark) property which prevent oxidation.

e) Difference between flocculated & Non flocculated suspension.(1/2 mark, any 4 points)

Flocculated suspension	**Non flocculated suspension**
1)Particle form loose aggregates & form net Work like structure.	1)Particle exist as separate entities.
2)The rate of sedimentation is high.	2)The rate of sedimentation is slow
3) Sediment is rapidly formed.	3) Sediment is slowly formed.
4)Sediment is easy to redisperse	4)difficult to redisperse
5)Sediment is loosely packed & does not Form a hard cake.	5)Sediment is very closely packed & a hard cake Formed.
6)Supernatant liquid is clear.	6)Supernatant liquid is not clear.
7)The floccules stick to the sides of bottle	7)The floccules do not stick to the sides of Bottle
8)Suspension is not pleasing in appearance.	8)Suspension pleasing in appearance.

f) Emulsion:-

An emulsion is a biphasic liquid preparation containing two immiscible liquids, one of which is dispersed as minute globules(dispersed phase) into the other(continuous phase)--------(1 mark)

Natural emulsifying agent like acacia, tragacanth, agar, pectin, starch etc.----------(1 mark)

g)Jellies:-

Jellies are translucent or translucent non-greasy, semisolid preparations meant for external application to the skin or mucous membrane. ----------(1/2 mark)

There are 3 types of jellies:- (1 and1/2 mark for each type)

1) Medicated jellies
2) Lubricating jellies
3) Miscellaneous jellies

h) Advantages of theobroma oil:- (1/2 mark for each, any 2)

1) It melt at body temperature
2)It release the medicament for rapid absorption
3)It is considered a most suitable base for rectal suppositories
4)It is readily liquefy on warming & quickly settle on cooling.

Disadvantages of theobroma oil:- (1/2 mark for each, any 2)

1)It shows the phenomena of polymorphism
2)It becomes rancid & melts in warm weather
3)It has tendency to stick to the sides of the mould when solidified.
4)On melting, it leak from the body cavity.
5)It is relatively costly
6)It is immiscible with body fluids.
7)When we add certain drugs with cocoa butter, liquefaction take place.

i)Ideal properties of antiperspirants:- (1/2 mark for each, any 4)

1) It should be non toxic
2) It should be non-irritant to skin
3)It should have pH between 4 to 4.5
4) It should have no effect on fabrics
5) It should possess sufficient astringent propert**y.**

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j)Pyrogens:-

Pyrogens are the metabolic product of micro-organisms which increase body temperature. (1/2 mark)

Characteristics of pyrogens:- (1/2 mark for each, any 3)

1)Pyrogens are polysaccharides.

2)They are thermostable.

3)They are soluble in water.

4)They can pass through bacteria proof filters.

5)They are unaffected by bactericide.

k)Suppository:-

Suppositories are solid dosage form of medicament for insertion into body cavities other than mouth. They may be inserted into rectum, vagina or nasal cavity. (1/2 mark)

Types of suppositories:- (1½ mark)

1) Rectal suppositories
2) Vaginal suppositories
3) Nasal suppositories
4) Urethral suppositories
5) Ear cones suppositories
6) Tablet suppositories
7) Layered suppositories
8) Capsule suppositories

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9)Coated suppositories

10)Disposable mould suppositories

l)Functions of abrasive agent:-

1)They remove debris & residual strains from the teeth surface without damaging it.(1/2 mark)

2)They polish the tooth surface.(1/2 mark)

e.g. calcium carbonate, calcium phosphate, magnesium trisilicate, calcium pyrophosphate, etc. (1 mark)

Q.2 Attempt any four (3 marks each)

a)Powders:-

A pharmaceutical powder is a mixture of finely divided drug and/ or chemicals in dry form. These are solid dosage form of medicament which are meant for internal & external use. (1 mark)

Classification of Powders:- (2 marks)

1) Bulk powder for internal use

e.g. Compound Rhubarb powder, Compound Bismuth powder

2) Bulk powder for external use:

a) Dusting powders:- i) Medical
ii) Surgical

b) Insufflations

c) Snuffs

d) Dentifrices

3) Simple powder for internal use

e.g. Asprin powder

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4) Compound powder for internal use

e.g. A.P.C. Powder

5)Powders enclosed in catchets:

a)Dry seal cachets
b)Wet seal cachets

b)Creaming:-

Creaming may be defined as the upward movement of dispersed globules to form a thick layer at the surface of the emulsion. (1/2 mark)

Factors which affect the rate of creaming:-

According to Stoke's law, the rate of creaming depends on the no. of factors which can be explained by the following equation:

$$V = \frac{2r^2(d1-d2)g}{9n}$$ (1/2 mark)

Where, V= Rate of creaming
r= radius of globules
d1= Density of continuous phase
d2= Density of dispersed phase
g= gravitational constant
n=Viscosity of the dispersion medium

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Explanation 2 marks

i) Radius of globules (r) :-

The rate of creaming is directly proportional to the radius of globules.
Larger the size of globules, the more will be creaming.
Smaller the size of globules, lesser will be creaming.
Hence, creaming can be reduced by reducing the size of globules by passing the emulsion through a homogenizer.

ii) Difference in density of d-isperse phase & continuous phase (d1-d2):-

The rate of creaming directly proportional to the difference between dispersed phase & continuous phase.
Greater the difference, more will be creaming.

iii) Viscosity of the dispersion medium (□):-

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

The rate of creaming is reduced by increasing the viscosity.
Viscosity can be increased by adding methyl cellulose & trgacanth. But to much viscosity should be avoided.

iv) Storage condition:-

The emulsion should be stored in a cool place because the rise in temperature reduces the viscosity which may lead to creaming.
The freezing should be avoided because it may lead to cracking.

c) Essential characteristics of eye drop:- ½ mark for each point

1) They should be sterile.
2) They should be iso-osmotic with lachrymal secretions.
3) They should be free from foreign particles, fibers & filaments.
4) They should be preserved with suitable bactericide.

5) They should have almost neutral pH

6) They should remain stable during its storage.

d) Nasal bougies:- (1 mark)

i) It is also called as nasal suppositories.

ii) These are meant for introduction into the nasal cavity.

iii) These are thin & cylindrical in shape .

iv) These are always prepared with glycerol-gelatin base.

v) Nasal suppositories are about 9-10 cm long & weigh about 1 gm.

Urethral bougies:- (1 mark)

i) It is also called as urethral supposiyories.

ii) These are meant for introduction into the urethra .

iii) These are thin , long & cylindrical forms rounded at one end to facilitate insertion.

iv) Their weight varies from 2 to 4 gm.

v) These suppositories are very rarely used.

Aurinaria:- (1mark)

i) It is also called as ear cones.

ii) These are meant for introduction into the ear.

iii) these are thin, long & cylindrical in shape.

iv) these are weigh about 1 gm.

v) usually prepared with theobroma oil.

vi) Nowadays ,these are rarely used.

e) Formulation of Lipstick:-

The following ingredients are required to make lipstick:- (2 marks)

(i) BASES:- The bases are mixtures of oils, fatty materials & waxes.

Such as mineral oil, vegetable oil, butyl stearate ,cocoa butter, petroleum, lanolin ,lecithin

Bees wax, carnauba wax , spermaceti etc.

(ii) ANTI-OXIDANTS:- These are used to prevent rancidity which occurs due to oxidation of some Ingredients.

e.g. propyl gallate, butylated hydroxyl anisole, butylated hydroxyl toluene etc.

(iii) COLOURING MATERIAL:- Colour used for lipstick are water soluble eosin & halogenated derivatives Of fluorescein & tetra bromofluorescein.

Certain pigments like titanium dioxide are also used to intensify the colour.

(iv) PERFUMES:- Only those perfumes are selected in lipsticks which should be non-irritant & having An agreeable taste.

e.g. Floral fruity & light spicy fragrances are generally used.

FORMULA:- (1 mark)

Carnaba wax 1gm

Bees wax 15gm

Lanolin 5gm

Cetyl alcohol 5gm

Castor oil 65 gm

Colouring matter & perfumes q.s.

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f) Therapeutic incompatibility:-

Therapeutic incompatibility may be as a result of prescribing certain drugs to a patient with the intention to produce a specific degree of pharmacological action, but the nature or intensity of the action produced is different from that intended by the prescriber. (1/2 mark)

This occur due to the following reasons: (2½ marks)

1. Error in dosage:-

It is error in writing or interpreting the prescription order.

The most serious type of dosage error in the dispensing is overdose of a medication.

So it is the duty of a pharmacist to check the prescription before dispensing it.

E.g.

Rx

Atropine sulphate 0.006gm

Phenobarbitone 0.015gm

Asprin 0.300gm

Prepare 10 capsule

In this prescription, the qty. of atropine sulphate in each capsule is more than its minimum recommended dose. So the prescription is referred back to the prescriber to correct the overdose of atropine sulphate.

2. Wrong drug or dosage form:-

There are certain drugs which have quite similar name & there is always a danger of dispensing of wrong drug.

For e.g. prednisone & prednisolone

Digoxin & digitoxin

Sometimes many drugs are available in different dosage forms & hence dosage form should be clearly mentioned on prescription.

3. Contra-indicated drugs:-

There are certain drugs which may be contra-indicated in a particular disease or particular patient who is allergic to it.

For e.g. Corticosteroids are contra-indicated in patients having an active peptic ulcer.

Penicillin & sulpha drugs are contra-indicated to the patients who are allergic to it.

4.Synergistic & antagonistic drugs:-

Many drugs exhibit synergism & antagonism when administered in combination.

Synergism:- When two drugs are prescribed together,they increase the activity of each other.

For e.g. a combination of asprin & paracetamol increases the analgesic activity.

Antagonism:-When two drugs having the opposing pharmacological effects are prescribed together antagonism occur.

For e.g. Acetyl acetic acid & probenecid are used in the treatment of gout,the combination of these lead to neutralization.

5.Drug interaction:-

The effect of one drug is altered by prior or simultaneous administration of another drug & it is corrected by proper adjustment of dosage.

For e.g.

Rx

Tetracycline HCL 250mg

Send 10 capsules.

Direction: Take 1 capsule every 6 hours with milk.

In this tetracycline is inactivated by calcium which is present in milk. So tetracycline capsule should not be taken with milk. So prescription may by referred back to the physician.

Q. 3 A. (1/2 mark for each point).

SR.NO.	O/W	W/O
1	In this type, oil is in dispersed phase & water is in continuous phase.	In this type water is in dispersed phase & oil is in continuous phase.
2	These type of emulsion is preferred for Internal use.	Mainly used externally as lotion or cream.
3	Emulsifying agent are used gum, acacia, tragacant, saponinfrom monovalent base like Na+,k+.	Woolfat, resin, beeswax & soap from divalent base like ca++.
4	Dilution Test -Emulsion diluted with water Result-Emulsion remains stabled.	Result-Emulsion break on its dilution with water.
5	Dye Test-Emulsion diluted with scarlet red dye Result-Dispersed globules appear red & ground is colorless.	Result- Dispersed globules appear colorless & ground is red.
6	Conductivity Test-This type of emulsion show bulb glowing on passing electric current.	Bulb doesn’t glow because oil is in continuous phase.

B) Defination - The powder moulded to form a tablet is known Tablet triturate or Moulded tablet.

- Moulded tablet are flat, circular disc & usually contain potent drug which are mixed with lactose, dextrose or other diluents. **Mark – 01.**

Preparation - Apparatus made up of stainless steel & consist of upper plate having Same number of holes as that of no. of pegs in a lower plate. At lower Plate two large pegs for fitting of the plate. The medicated lactose is made Into stiff paste with 60% alcohole.The filled paste is pressed down, Thus leaving the paste in the form of tablet.

The tablet is dry for 1 to 2 hrs & then packed into pillbox. **Mark – 02.**

C) i) Hora somni — Every hour

ii) Haustus ----- A Drought

iii) Pulvis ----- Powder

iv) Cochlear Ampulum --- One Tablespoonful

v) One quart ---- 40 fl oz

vii) Capiendus --- To be taken **Mark – ½ For Each.**

D) The following method are commonly used for evaluating the physical stability of suspension.

a) Sedimentation Method - sedimentation volume is the most important parameter in the Evaluation of the stability of suspension.

b) Rheological Method - The viscosity of suspension is studied at different time interval by Using good quality of viscometer.

c) Electro kinetic Method - the determination of surface electric charge or zeta potential of

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Suspension, this zeta potential form stable suspension because Of controlled flocculation.

d) Micromeritic Method - Stability of suspension depends upon particle size of dispersed Phase. When partical size grow then there is formation of lumps or cake. **Mark – 03.**

E) (½ Mark of each point)

1) Rapid onset of Action

2) Immediate therapeutics action is possible.

3) Each dose can be administered accurately.

4) When oral route is not possible in unconscious & non-co-operative patient.

5) When drug get inactivated in GIT tract.

6) Prolong action can be possible by this route.

7) Absorption of the drug faster as compare to other route.

F) **Cold cream -** cold cream is cosmetic preparation which is applied on the face.

- It gives cooling sensation caused by evaporation of the water in the cream after its application on the skin.
- It is prepared by emulsification of oil & water.
- They may be o/w or w/o emulsion cream
- Beeswax-Borax cream is widely used. **Mark – 1½**

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Cleansing cream - cleansing cream is cosmetic preparation which are applied to the skin

To remove grime, sebum, dead cell & applied make up.

- Soap & detergent improve cleansing properties.

- In case of o/w type of cleansing cream tween are used along with detergent to

Remove dirt.

- Pepsin is added to make the facial skin smooth. **Mark – 1½**

Q.4 A. Adjuvant used in the formulation of Elixir. **(Mark – 03)**

1) Vehicle - It is prepared by using water, alcohol, glycerin, sorbitol ,propylene glycol.

- Water is used to dissolve ingredients.

- Alcohol is used to dissolve flavouring agent.

2) Adjunct -

a) Chemical stabilizer - It is used to improve chemical stability

Example - Citric acid is added to prevent darkening of elixir on storage.

- Disodium edetate.

b) Colouring agent - It is used to give attractive colour to the preparation

Example - Coal tar dye, Amaranath, Compound tartrazine, GreenS

c) Flavouring agent - It is used to impart flavour to the preparation.

Example - Black current syrup, Raspberry, Lemon, Orange syrup.

d) Preservative - It is used to prevent growth of bacteria.

Example - Propylene glycol, Chloroform water, Benzoic acid, Methyl paraben.

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B) (1/2 Mark for each point)

SR.NO	Paste	Ointment
1	They contain high concentration Ion of medicament.	They contain low concentrate Ion of insoluble medicament.
2	They are stiffer, less greasy in consistency	They are soft & greasy in consistency
3	They are more absorptive	They are less absorptive.
4	They resist to flow with increase in force of Application.	They flow more easily with increase In force of application.
5	The paste adheres to the skin.	They do not adhere to the skin.
6	They are used mainly as Antiseptic. protecti	They are mainly used as protective Emollient.

C) Ophthalmic suspension - It is not commonly used.

- They are prepared only in those case when drug is insoluble in the Vehicle or unstable in liquid form.

- They should be sterile, having desired viscosity & isotonic. **Mark – 1½**

Opthalmic ointment - opthalmic ointment is sterile preparation meant for application to the eyes.

- These are prepared under aseptic condition.

- White soft paraffin is not used in the preparation of ointment because it may Contain small traces of bleaching agent which are left over after bleaching The yellow soft paraffin. Hence it may causes irritation to the eyes. **Mark – 1½**

D) Definition - The quantity of the drug which displaces one part of the base. **Mark – 01**

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Significance - For preparation of uniform suppositories, accurate weight, allowance must be

Made for the change in density of the mass due to added medicament.

For this purpose displacement value is consider. **Mark - 01**

Example -1. Prepare & weigh 6 suppositories containing theobroma oil=a gramme

2. Prepare & weigh 6 suppositories containing,40%medicament=b gramme.

3.Calculate the amount of theobroma oil present in medicament suppositories. **Mark - 01**

$$\frac{60}{100} \text{ X } b = c \text{ gramm.}$$

4. Calculate the amount of medicament present in medicated suppositories.

$$\frac{40}{100} \text{ X } b = d \text{ gram.}$$

5. Calculate the amount of theobroma oil displace by d gramm of

Medicament = (a-c) gram.

Displacement value of the medicament = $\frac{d}{a-c}$

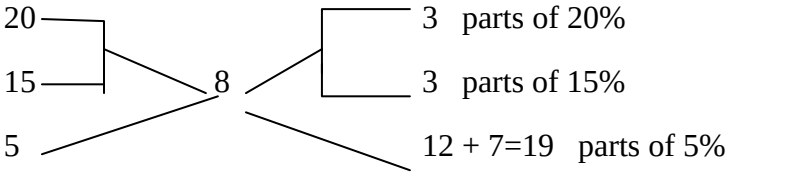
E) TPN-IT is total parentral nutrition. **(Mark – 01 for definition)**

Definition- Intravenous administration of calories, nitrogen & other nutrients in sufficient Quantity to produce tissue synthesis of anabolism is called as Parental Nutrition

1. TPN solution consist of mixture of Amino acid, lipid, electrolyte & vitamin & Traces of element.
2. These solution are administration slowly through peripheral vein, where it is Diluted by large volume of blood so as to minimize the risk of tissue Or cell damage.
3. TPN is generally administration to avoid multiple injection of nutrition Required by patient by IV route.
4. TPN is given to fulfill the nutritional requirement in pre-operative & Post-operative condition. **Mark - 02**

F)

Alligation Method



Total 25 parts of 8%

i) Volume of 20%alcohol required

25parts:120ml : : 3parts:v

$$V = \frac{120 \times 3}{25}$$

V = 14.4 ml

ii) Volume of 15% alcohol required
25 parts:120ml :: 3parts :v

$$V = \frac{120 \times 3}{25}$$

V = 14.4 ml

iii) Volume of 5% alcohol required
25 parts:120ml :: 19parts :v

$$V = \frac{120 \times 19}{25}$$

V = 91.2 ml

Result: 14.4ml of 20%,14.4ml of 15% & 91.2ml of 5% alcohol required to make 120ml of 8%
(check- 14.4+14.4+91.2=120ml) **Mark – 0**3.

Q.5) Solve any four (Each question 3marks)

a) Effervescent granules are solid dosage form of medicament producing effervescence meant for internal use. They contain medicament mixed with citric acid, tartaric acid and sodium bicarbonate.

Functions effervescent granules **(1 mark)**

1)The carbonated water produced from release of carbon dioxide serves to mask the bitter & saline taste of drug.

2)Also carbon dioxide stimulates flow of gastric juice & helps in absorption of medicament

Functions of ingredients **(1 mark)**

1) **Sodium bicarbonate :**

It reacts with acid when preparation is added to water. The evolved carbon dioxide produce the effervescence

2) Citric acid

a)To release water of crystallization & to create conditions for release of more water .

b)Partial neutralization of bicarbonate.

3)Tartaric acid :

Only for neutralisation

The water needed for granulation is provided from two sources

From water of crystallization of citric acid.

The citric acid contains one molecule of water of crystallization (equal to 8.75% of its weight.) which is librated during heating.

$3NaHCO_3 + C_6H_8O_7.H_2O \rightarrow C_6H_5Na_3O_7 + 3CO_2 + 3H_2O$

sodium citric acid sodium citrate

Bicarbonate

2)The water produced from the reactions of citric acid & tartaric acid with sodium bicarbonate.

$2NaHCO_3 + C_4H_6O_6 \rightarrow C_4H_4Na_2O_6 + 2CO_2 + 2H_2O$

Sodium tartaric acid sodium

Bicarbonate tartarate

Method of preparation : **(1 MARK)**

1)A large porcelain dish is placed on a water bath, with as much of the dish as possible exposed to the water or steam

2)The dish must be hot to ensure rapid liberation of water of crystallization from citric acid. If heating is delayed until powder is placed in the dish, the water is liberated slowly as the temp. rises , but much is lost by evaporation.

3)The ingredients are powdered, sieved, weighed & mixed. They are then placed in dish & pressed down with spatula until the mixture has been formed a loose cake or damp coherent mass.

4)The mixture is passed through sieve No. 8- 14 initially. Dry the granules at 60 º c Then they are again passed through sieve no. 14-20. to collect reqd. fraction

Q.5 b)(3 marks)

Rx

Caffine citrate	1gm
Sodium salicylate	3gm
Water q.s	90ml

- Caffine citrate is mixture of citric acid & caffeine in equal parts. Due to presence of citric acid , salicylic acid is ppted out.
- This cannot be tolerated.

Correction: Replace Caffine citrate with half qty. of caffine.

c) Differentiate between Liniment & Lotion.(1/2 mark each difference)

Liniments	Lotions'
1.They are used for counter irritant, rubefacient, sooting or stimulating purpose	1.They are used for topical effect such as local cooling, soothing, protective & emollient effect
2 Applied with friction	2 Applied without friction
3 Vehicle is mostly oily or alcoholic	3 Vehicle is mostly aqueous
4 These are used for application to the unbroken skin.	4 Lotions can be applied on broken or inflamed skin.
5.Applied directly	5.applied with cotton gauze
6.Turpentine liniment	6.Sulphur lotion

d)

A suspension is biphasic system composed of finely divided insoluble material suspended in liquid) Average particle size ranges from 0.5 - 5 micron.(1/2 mark definition)

Classification of Suspensions. **(1/2 mark)**

Oral suspensions

Parenteral suspensions

Ophthalmic suspensions

Suspension for external use

(1/2 mark for each definition)

1.Oral suspensions

Oral suspensions contain flavoring agent and sweetening agent to mask the bitter taste of the drug.

made palatable by using a suitable derivatives of drugs

e.g., chloramphenicol palmitate.

2. Parenteral suspensions

The suspensions which are administered by parenteral route are called parenteral suspensions.

suspensions should be sterilized.

(i) The particle size of the drug should be such that it can be easily pass through the needle of the syringe.

((iii) The concentration of solid particles in the suspension should be between 0.5 to 30%.

(iv) The viscosity of the suspension should not interfere with its flow through the syringe needle.

3.Ophthalmic suspensions ;

are prepared only in those cases, when the drug is insoluble in the desired solvent or unstable in liquid form. Particle size of the eye suspensions should be fine enough so that it should be non-irritating to the eye. It should be sterilized, isotonic and have desired viscosity

4. Suspensions for external use

Meant for external use.

e.g., lotions, inhalations, ear drops etc.

It contains very small particles to avoid grittiness. Lotions which are meant for application on broken or inflamed skin should be free from harmful microorganisms

(e) DEPILATORIES (HAIR REMOVER)

It is preparation designed for removal of superfluous hair from face , legs & hands without causing any injury to skin.

1) Epilation: (1 1/2 mark)

It is mechanical removal of hair by method like plucking, waxing, electrolysis.

It is painful & may cause skin damage.

Chances of skin secretion increased.Contains rosin, Beeswax along with vegetable oil, cooling agent, local anaesthetic & antibacterial agent.

2) Depilation :(1 1/2 mark)

It involves chemical breakdown of the hair without injury to skin.

Mechanism are alkaline reducing agents which cause the hair fiber to swell & produce a cleavage of disulphide or cystein bridges between adjacent polypeptide chain & degrade the hair.

Ingredients used

Sulphides of barium , calcium & strontium.

Calcium thioglycerol & calcium thioglycolate are also used.

calcium sulphide are popular depilating agent without serious effect.

Keratinase enzyme is also used.

f) parenteral dosage form: Definition:- parenteral products are considered to be the sterile drugs, solutions, suspension or emulsions that are administrated by hypodermic injection either in the form in which they are supplied or after the addition of suitable solvent or suspending agent**.(1 mark for definition)**

Types of parenterals :(2 marks)

1. Sterile solids: Drugs which are not soluble in solution are supplied as dry sterile solids which are dissolved in suitable solvent before its administration.

2. Sterile suspension: Drugs which are insoluble in vehicle are formulated as suspension. These are sterile suspension of drugs in a suitable solvent which are administered by intramuscular route eg sterile chloramphenicol suspension.

3. Solutions: These are solution of drugs in a suitable solvent supplied in single or multiple dose container

4. Emulsions: Drugs like oils or immiscible liquids for parenteral use are formulated as emulsions.

5. Transfusion fluids: These are parenteral solutions which are administer by intravenous route. These are for nutrition & to maintain electrolyte balance. eg. Ringer's solution

Q.6 a)Importance of prescription(3 marks)

Parts of Prescription:

Superscription

Inscription

subscription

Signature

i)Superscription-

It consists of name, Registration no., qualification ,address of the physician & date of prescription along with name , age, sex, & address of patient

The physician name ,Registration no., qualification ,address is essential for the identification of prescriber particularly for Narcotic prescription &particularly habit forming drugs to prevent it's misuse.

Date helps in judging time interval between issue of prescription & that of dispensing it. particularly for habit forming drugs like Narcotic prescription &cumulative drugs like digitalis , arsenic

The name , age, sex, & address of patient is important for proper handling of prescription & also identification of patient. Age & sex is important especially for children to check prescribed dose of medication

The superscription also consists of symbol Rx which is instruction to pharmacist .R stands for latin word recipe & oblique after R represents sign of Jupiter meaning God of healing. That is for praying quick recovery of patient.

ii) Inscription: This is main part of prescription order & contains name & the quantities of the prescribed ingredients. The name of ingredients are written in English but common abbreviation used can be written both in English & latin languages. In complex prescription containing several ingredients ,the inscription is divided into parts like Base ,Additives & vehicle.

Now a days ,The drugs prescribed are already available in a suitable formulation

manufactured by different manufacturer. so no compounding is needed. The pharmacist is required to dispense the readymade form of drugs

iii) Subscription: It contains direction to the pharmacist for preparing prescription which is usually 'Mix' , or 'Send tablets or capsules ' etc.

iv)Signature: The word signature is derived from latin ‘signa ‘ meaning write ,make or label. I t consists of the directions for the patient regarding administration.

This may include, a) The method of administration or application.(b)The dose if preparation is for internal use. (c) the time of administration or application.

v)Renewal instruction; The prescriber should mention renewal instruction on the label if required & frequency of renewal. This is important for the narcotics & habit forming drugs to prevent its misuse.

Model prescription (1 mark)

SHRUTI NURSING HOME
158,N.M marg, Nagpur ph:4442233

Date:06/04/2013

For, Miss Simran shah, Age:28 Sex: Female
199, N.M.Marg, Nagpur
Rx
Kaolin mixture B.N.F.,(inscription)
Send 200 ml (subscription)
Label: Two Teaspoonful to be given three times a day. (Signature)

Dr S.M.Patil,
M.D.,
Regd.No.2541/12

Refill:

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b) (4 marks)

PHYSICAL INCOMPATIBILITY: is due to insolubility , immiscibility & liquefaction

a) Insolubility

i) Indiffusible solids such as chalk , sulphadimidine **a thickening agent** is necessary to obtain an elegant product from which uniform doses can be removed.

ii) some **insoluble powders** such as sulphur & certain corticosteroids are difficult to wet with water. wetting agent is used to distribute the powder

b)Immiscibility

Oils are immiscible with water ,a problem can be overcome by emulsification or solubalization.

Castor oil 15 ml

Purified water q.s. 40ml

Make an emulsion

Label: take at once.

This is case of physical incompatibility.

Oil & water do not mix. Emulsification corrects the incompatibility.

Dispense as an **emulsion**

C)Liquefaction

When certain low melting point solids are powdered together, a liquid or soft mass is formed due to lowering of M.P. of the mixture to below R.T.

Eg of medicament exhibiting this property:

Camphor, menthol, phenol, thymol, chloral hydrate.

The combination forms eutectic mixture.

In powder form it is necessary to triturate the liquid with enough qty absorbent powder eg. Light kaolin, or light magnesium carbonate to give free flowing product.

When final bulk is to large for prescribed dosage form, it may be possible to solve problem by separately mixing each ingredient with small amount of diluent, lightly combining the two mixtures & packing resultant powder in capsule.

d) 1 mark for each definition

(i)Tolerance - When usually large dose of drug is required to elicit an effect ordinarily produced by normal therapeutic dose of drug, the phenomenon is known as drug tolerance.

Eg alcohol, nicotin

ii) Tachyphylaxis -when certain drugs are administered repeatedly at short interval of time, the cell receptors get blocked up & pharmacological response to that particular drug is decreased.

The decrease response cannot be reversed by increasing the dose.

The phenomenon is known as tachyphylaxis

iii) Idiosyncracy - An extra ordinary response to a drug which is different from its characteristic pharmacological action is called idiosyncrasy.

Eg. Morphine can produce excitation in some individual, specially in women , although normally it depresses central nervous system.

iv) Antagonism- When two or more drugs have opposite effect, the action is neutralised. Eg. Ephedrine & phenobarbitol.

d) Test for pyrogens –

Two mathods: (2 marks for each method)

i)Sham Test: Pyrogen testing done on rabbit: The test involves the measurement of rise in body temp. of rabbit following intravenous injection of a sterile solution of a substance being examined. Three healthy rabbits ,each weighing not less than 1.5 kg are selected. They are kept on balanced diet.& are not showing any loss body weight .The solution under test is injected slowly through ear vein in a volume of 0.5 to 10 ml/kg of

body weight. Record the temperature of each rabbit in an interval of 30 mins for three hrs. after the injection. The difference between initial temp & the maximum recorded as response.

If no rabbit shows an individual rise in temperature of 0.6 °C or more above its respective control temperature, and if the sum of the 3 temperature rises does not exceed 1.4 °C, the tested material meets the requirements for the absence of pyrogens. If 1 or 2 rabbits show a temperature rise of 0.6 °C or more, or if the sum of the temperature rises exceeds 1.4 °C, continue the test using 5 other rabbits. If not more than 3 of the 8 rabbits show individual rises in temperature of 0.6 °C or more, and if the sum of the 8 temperature rises does not exceed 3.7 °C, the tested material meets the requirements for the absence of pyrogens.

ii)**LAL test** is used for the detection and quantification of bacterial endotoxins.

Limulus amebocyte lysate (LAL) is an aqueous extract of blood cells (amoebocytes) from the horseshoe crab, Limulus polyphemus. LAL reacts with bacterial endotoxin or lipopolysaccharide (LPS), which is a membrane component of Gram negative bacteria.

The solution of endotoxins containing preparation is added to the lysate derived from heamolymph cells of horseshoe crab (limulus polymhemus). The result of the reaction is turbidity or precipitation or gelation of the mixture. This is used as a quantitative measure to estimate the endotoxin content. The rate of reaction depends upon conc. of endotoxins, pH, temperature and presence of clotting enzyme system and clottable proteins from lysate

e) Pharmaceutical factors responsible for selection of ointment base. (1 mark for each factor)

- Stability
- Solvent properties
- Emulsifying properties
- Consistency

1) Stability

The fats and oils are liable to undergo oxidation. This can be prevented by adding antioxidant

ointments containing liquid paraffin may get oxidized on prolong storage.

O/w type emulsion bases are liable to microbial growth and needs a proper preservative.

Emulsified bases are liable to phase separation due to improper formulation or under the influence of temperature

2) Solvent properties

Medicaments insoluble in the ointment bases are mixed in finely powdered form for uniform distribution,

Phenol in solid form is quite caustic and cause blisters in a finely divided form in an ointment base. Hence, a base consisting of a mixture of hard and soft paraffins, beeswax and lard is recommended for phenol, which keep phenol in solution form

3) Emulsifying properties

Hydrocarbon bases can absorb only a small amount of water in comparison to animal fats which can absorb a large quantities of water.

wool fat is included for the preparation of base meant for eye ointments.

Similarly cetrimide emulsifying ointment is capable of absorbing considerable amount of water forming o/w creams

4) Consistency

should be of suitable consistency. It should neither be too hard nor too soft.

The consistency be such that it withstand wide variation in temperature conditions.

The consistency of an ointment can be adjusted by using of high melting point substances like hard paraffin, beeswax in soft ointments and low melting point substances like liquid paraffin in hard ointments respectively.

f)

It is **physical incompatibility of immiscibility**. Oil & water are immiscible. Therefore emulsification is required**.(1mark)**

For calculation1 ½ mark

Method: The arachise oil is a fixed oil , therefore the proportion of oil: water: gum: for preparing primary emulsion is 4:2:1.

Formula for preparing primary emulsion is (2 marks for formula)

Arachis oil	50ml
Water	25 ml
Acacia powder	12.5 gm

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For any of the method 1 ½ mark

Emulsion prepared by dry gum method:

Dry Gum method

Procedure: Measure the required quantityy of arachise oil in a dry measure & transfer it into a dry mortar.Add calculated qty. of gum acacia powder & triturate rapidly to form a uniform mixture. Add 25 ml of water & triturate vigorously til a clicking sound is produced & product becomes white. Make up volume with water to produce required quantity.

Wet gum method

Procedure: Measure the calculated qty. of gum acacia powder transfer it into a dry mortar & then add water required for primary emulsion & triturate rapidly to form a uniform mixture & then add oil in part & by part &triturate vigorously till a clicking sound is produced .Make up volume with water to produce required quantity .