TIRUPATI COLLEGE OF POLYTECHNIC AND PHARMACY, RATIA

D. PHARMACY SECOND YEAR

PHARMACEUTICS - II

Section - A

Question No. 01 (A) Translate the following Latin terms. 1X10=10

Latin Terms	**Meaning in English**
1) Alternis horis	**Every two hours**
2) Mode dicto	**As directed**
3) Statim	**Immediately**
4) Nebula	**A spray solution**
5) Dolore urgente	**When pain is severe**
6) Charta	**A powder**
7) Non-repetatur	**Do not repeat**
8) Post cibos	**After meals**
9) Aqua bulliens	**Boiling water**
10) Utendus	**To be used**
11) Inter cibos	**Between meals**
12) Tussi urgente	**When cough is troublesome**
13) Nocte maneque	**Night & morning**
14) Quaque quarta hora	**Every fourth hour**
15) Omni hora	**Every hour**
16) Phiala prius agitata	**The bottle having been previously shaken**
17) Uncia	**One ounce**
18) Mitte tales	**Send such**
19) Ter in die	**Three times a day**
20) Octarius	**A pint**
21) Quotidie	**Daily/ Every day**
22) Omni mane	**Every morning**
23) Prorenata	**As needed/ Ocassionally**
24) Sumendus	**To be taken**
25) Pro dosi	**As a dose**
26) Quarta	**Unit of liquid measure/ a gallon/ 3.7 litres**
27) Omni quandranta hora	**Every fourth hour**
29) Diebus alternis	**On alternate day**
30) Adlibitum	**At one's pleasure**

31) Cataplasma	**Poultice**
32) Agita	**To be shaken**
33) Si opus sit (S.O.S)	**When required / when necessary**
34) Hac nocte	**To-night**
35) Bis in die	**Twice a day**
36) Modo priscripto	**As prescribe**
37) Applicandus	**To be applied**
38) E. lacte	**With milk**
39) Hora somni (H.S.)	**At bedtime**
40) Ana (a.a)	**Of each**
41) Mane	**In the morning**
42) Parti affectae applicands (P. a.a.)	**To be applied on the affected part**
43) T. I. D(Ter in die)	**Three times a day**
44) Ante cibos	**Before meals**
45) Cochleare amplum (Coch. amplum)	**One tablespoonful**
46) Collunarium	**A nose wash**
47) Unguentum	**An ointment**
48) Gutta (g.t.t)	**Drop**
49) Secundum artem	**Mix pharmaceutically (according to art)**
50) Collyrium	**An eye wash**
51) Oculo utro	**For the right eye**
52) Pulvis	**Powder**
53) Mistura	**Mixture**
54) Omni nocte	**Every night**
55) Ex. Aqua	**With water**
56) Capiendus	**To be taken**
57) Quindecim	**Fifteen**
58) Oculis dexter	**For the right eye**
59) Oculis leavus	**For the left eye**
60) Capiti	**To the head**
61) Fiat	**Make**
62) Semel in dies	**Once a day**

Question no. 01 (b) Fill in the blanks. Each question carry one mark

1) Oil and water are **Immiscible** with each other.

2) When two or more powders are mixed together, they are known as **Compound** powders.

3) Liniments must not applied on **Broken** skin.

4) Wetting agents reduce **Interfacial tension** between the solid particles and liquid medium.

5) In an emulsion complete separation of two phases is known as **Cracking.**

6) Cocoa butter is also known as **Theobroma Oil.**

7) Two method of preparation of ointments are **Trituration** and **Fusion** methods.

8) Incompatibility between phenobarbitone sodium and ammonium bromide is removed by **Replacing** ammonium bromide with **Sodium bromide.**

9) In flocculated suspension the particle form **loose aggregates** and form a **Network** like structure.

10) The rate of creaming is governed by a law known as **Stoke's law.**

11) Fusion method of preparation of ointments is used when ointment base contains a number of **Solid ingredients** of different **Melting point.**

12) Liquid extract of liquorice has its flavouring properties due to the presence of **Glycyrrhizin.**

13) The main ingredients of effervescent granules are **Sodium bicarbonate, citric acid,** and **tartric acid.**

14) Compound tragacanth powder is used as suspending agent in the ratio of **2%** of total mixture to be prepared.

15) The fine particles of solids in suspension give a **Slow** rate of **Sedimentation.**

16) When W/O type emulsion changes into O/W type and vice-versa, the phenomena is known as **Phase inversion.**

17) When two or more than two low melting point solids are mixed together, they liquefy such substances known as **Eutetic mixture.**

18) Bottles containing liniments and lotion must be **shaking** before use.

19) Suppositories are meant for **Insertion** into body cavities other than **Mouth.**

20) TPN stands for **Total parenteral nutrition.**

21) Generally dentirifices are applied to the teeth with the help of **Brush.**

22) Hydrous wool fat or lanolin is a mixture of **70%** wool fat and **30%** purified water.

23) Liquid for external use is dispensed in coloured **fluted** bottles.

24) Simple syrup contains **66.67%** w/w of sucrose.

25) HEPA stands for **high efficiency particulate air.**

26) Suppositories introduced in vagina are called **Vaginal suppositories**

27) **Saccharin** is used as sweetening agent for many foods for diabetic patients

28) Eye ointments are sterilised by **dry heat method.**

29) Wool fat is also known as **anhydrous lanolin.**

Question no. 01 (c)

1. 1 gallon = **160** fluid ounces.
2. 1 grain = **60** mg.
3. 1 table spoon = **15** ml.
4. 1 scruple = **20** grain.
5. 1 drop = **0.06**ml.
6. 1 fluid ounce = **30** ml.
7. 1 teaspoonful = **1** fl. Drachm.
8. 1 kilogram = **2.2** pounds.
9. 1 quart = **40** fl. Ounces.
10. 1 teaspoonful = **4** ml.
11. 1 teacupful = **120** ml.
12. 1 drachm = **60** grains.
13. 1 fl. Drachm = **4** ml.
14. 1 pound (Lb) = **12** ounces.
15. 1 pint = **20** fl. Ounces.
16. 1 kilogram = **1000** gm = $\mathbf{10^6}$ mg.
17. 1 ounce = **8** drachms
18. 1 drop = **1** minims
19. 1 teacupful = **4** fl. Ounces
20. 1 gram = **1000** mg.
21. 1 desert spoonful = **8** ml.
22. 1 ml = **15** minim.
23. 1 ounce = **8** drachms = **480** grains

SECTION – B

Attempt any five questions. **3 x 5 = 15**

Question no. 01 How will you dispense a mixture of iodides with ferric salts in the presence of alkali salts? Give reason.

Question no. 02 Explain dilling rule and idiosyncrasy.

Question no. 03 Describe in brief about geometrical dilution.

Question no. 04 Explain why oily vehicle is not used in the preparation of nasal drops.

Question no. 05 Explain stokes law.

Question no. 06 Discuss preservation and containers for jellies.

Question no. 07 Explain why the cotton wool should not used for lubricating the moulds.

Question no. 08 How will you dispense a mixture of borax glycerine and sodium bicarbonate and why?

Question no. 09 Explain Young's rule and Clark's formula.

Question no. 10 Explain why gargles are dispensed in concentrated form.

Question No. 11 Explain cracking of emulsion.

Question no. 12 Explain why the synthetic suppository bases do not require lubrication of moulds.

Question no. 13 How will you dispense a mixture of glycyrrhiza liquid extract with acidic substances? Give reason.

Question no. 14 What is the duty of pharmacist incase of the medicine is prescribed in over dose?

Question no. 15 How is bulk powders packed and stored?

Question no. 16 Explain why liniments should not be rubbed on broken skin.

Question no. 17 Write brief about preservation of emulsion. Or Explain why the moulds require lubrication for oily or aqueous suppository bases.

Question no. 18 How is non-staining iodine ointment prepared?

Answers:

Question no. 01 How will you dispense a mixture of iodides with ferric salts in the presence of alkali salts? Give reason.

Ans: Iodides undergo oxidation, forming iodine which is an undesirable product. When ferric salts react with soluble iodide it gets converted into ferrous salts. To prevent incompatibility, ferric salts may be substituted with iron and ammonium citrate. Where, iron is converted into an organic compound which does not yield ferric ions. For example, when soluble iodides react with potassium chlorate, free iodine is liberated. The freshly prepared mixture is quite clear but upon standing for some time, crystals of iodine get deposited. To prevent this incompatibility, the two reacting substances must be dispensed separately and patient may be directed to mix the two solutions before use.

Question no. 02 Explain dilling rule and idiosyncrasy.

Ans: Dilling's formula: The formula is used for calculating the dose for children in between 4 to 20 years of age. Dose for the child = Age in years/20 × adult dose

Idiosyncrasy: An extraordinary response to a drug which is different from its characteristic pharmacological action is called idiosyncrasy. For example, small quantity of aspirin may cause gastric hemorrhage and a small dose of quinine may cause ringing in ear.

Question no. 03 Describe in brief about geometrical dilution.

Ans: Geometric dilution method is used when potent substances are mixed with a large amount of diluents. The potent drug is placed upon an approximately equal volume of the dilute in a mortar and substances are slightly mixed by trituration. A second portion of diluents equal in volume to the powder mixture in the mortar is added and trituration is repeated. The process is continued, e.g. if 100 mg of potent drug is required to be mixed with 900 mg of lactose, then according to geometric dilution, the following procedure should be followed: 100 mg of a potent drug + 100 mg of lactose = 200 mg mixture

200 mg of the mixture + 200 mg of lactose = 400 mg mixture

400 mg the mixture + 400 mg of lactose = 800 mg mixture

800mg of the mixture + remaining portion of lactose = 1000 mg mixture

Question no. 04 Explain why oily vehicle is not used in the preparation of nasal drops.

Ans: Nasal drops are aqueous solution of drops that are instilled into the nose with a dropper. The oily vehicle is not used now a days because oily drops inhibit the movement of cilia in the nasal mucosa and if used for long periods, may reach the lungs and cause lipoidal pneumonia. Nasal drops should be isotonic with 0.9% NaCl having pH and viscosity similar to nasal secretions.

Question no. 05 Explain stoke's law.

Ans: stock's law: According to stock's law, the rate of creaming in emulsion is depends on the number of factors which can be explained by following equation:-

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

Where V = rate of creaming, r = radius of globule, d_1 = density of dispersed phase, g = gravitational constant, d_2 = density of continuous phase, ŋ = viscosity of the dispersion medium

(i) Radius of globule: The rate of creaming is directly proportional to the radius of the globules so rate of creaming can be minimized by reducing the size of globules by passing the emulsion through a homogenizer.

(ii) Difference in density of disperse phase and continuous phase: The rate of creaming is directly proportional to the difference between density of disperse phase and continuous phase.

(iii) Viscosity of dispersion medium: The rate of creaming is indirectly proportional to the viscosity of dispersion medium. The viscosity can be increased by adding tragacanth and methyl cellulose but viscosity of dispersion medium should be optimum.

(iv) **Storage condition:** The emulsion should be stored in a cool place because rise in temperature reduces the viscosity which may lead to creaming.

Question no. 06 Discuss preservation and containers for jellies.

Ans: Preservation of jellies: The jellies contain large amount of water so these are prone to bacterial and fungal growth. The jellies must be suitably preserved by adding a preservative like methyl p-hydroxybenzoate (0.1 to 0.2% w/v), propyl p-hydroxybenzoate (0.05%), chlorocresol (0.1 to 0.2%), phenyl mercuric nitrate (0.001%), benzoic acid (0.2%) and benzalkonium chloride (0.02%).

Containers for jellies: Jellies are stored in well filled, well closed, wide mouth plastic containers to minimize the evaporation of water. Jellies are stored in a cool place to prevent drying out. The sterile jellies, such as catheter lubricants are packed in collapsible tubes.

Question no. 07 Explain why the cotton wool should not use for lubricating the moulds.

Ans: The lubrication of the suppositories mould is essential where cocoa butter or glycero-gelatin base is used for the preparation of suppositories. The lubricant should be applied with the help of brush or a swab made of gauze. Cotton wool should not be used because the cotton fibres get detached from it. Excessive lubrication should be avoided. The excess of lubricant can be drained by closing the mould and put it in the inverted position.

Question No. 08. How will you dispense a mixture of borax glycerine and sodium bicarbonate and why?

Ans: When borax with glycerin is mixed together the sodium metaborate and boric acid is formed.

$$Na_2B_4O_7 + 3H2O \longrightarrow Na_2B_2O_4 + 2H_3BO_3$$

The boric acid so formed reacts with glycerin to form monobasic glyceryl boric acid which liberates carbon dioxide from the bicarbonate. To hasten the reaction ingredients should be mixed in an open vessels using hot water as a vehicle. $2C_3H_5(OH)_3 + 3H_3BO_3 \longrightarrow (C_3H_5)_2(HBO_3)_3 + 6H_2O$

The mixture should not be transferred to a bottle until effervescence ceases.

Method of dispensing: When sodium bicarbonate, borax and glycerin are mixed together in the presence of water, a reaction take place with the evolution of carbon dioxide. If the mixture is dispensed as such there are chances of bursting the bottle. Therefore, mix the ingredients in an open vessel until evolution of carbon dioxide ceases.

Question No. 09 Explain Young's rule and Clark's formula.

Ans: Young's formula: The formula is used for calculating the doses for children under 12 years of age. The doses calculated by Young's formula are proportionate to age.

$$\text{Dose for the child} = \frac{\text{Age in years}}{\text{Age in years}+12} \times \text{adult dose}$$

Clark's formula: The formula is used for calculating the doses for children according to body weight. The doses calculated by Clark's formula are proportionate to body weight.

$$\text{Dose for the child} = \frac{\text{child's weight in kg}}{70} \times \text{adult dose}$$

Question No. 10 Explain why gargles are dispensed in concentrated form.

Ans: Gargles are aqueous solutions used to prevent or treat throat infections. They are usually available in concentrated form. So they are used with direction for dilution with warm water before use. They are used for relieving soreness of throat infections. An antibacterial agent such as phenol or thymol is usually present in it but not in high enough concentration to avoid its anaesthetic effect. So gargles are dispensed in concentrated form which also avoids the microbial growth as diluted form favours the growth of micro-organism.

Question No. 11 Explain cracking of emulsion.

Ans: An emulsion is a biphasic liquid preparation containing two immiscible liquids. The liquid which is converted into minute globules is called the dispersed phase and the liquid in which the globules are dispersed is called continuous phase. To make two liquids miscible with each other by reducing interfacial tension an agent is added to the preparation called emulsifying agent.

Cracking of emulsion: - Cracking means the separation of two layer of disperse and continuous phase, due to the coalescence of disperse phase globules, which are difficult to redisperse by shaking. Cracking occurs due to following reasons: -

1) By addition of emulsifying agent of opposite type
2) By decomposition or precipitation of emulsifying agents
3) By addition of a common solvent
4) Changes in temperature
5) By growth of micro-organism
6) By creaming

Question No. 12 Explain why the synthetic suppository bases do not require lubrication of moulds.

Ans: Emulsifying bases are also known as synthetic bases. Most synthetic bases are prepared by first hydrolysing the vegetable oil, then hydrogenating the resulting fatty acids and finally re-esterifying the acids by heating with alcohol. In case of synthetic suppositories base no mould lubrication is needed because they contract significantly on cooling and they do not stick to the side of the mould.

Question No. 13. How will you dispense a mixture of glycyrrhiza liquid extract with acidic substances? Give reason.

Ans: Liquorice liquid extract is used as a flavouring agent. The flavouring properties is due to glycyrrhizin which is a mixture of potassium and calcium salts of glycyrrhizinic acid. Acid decompose glycyrrhizin into glycyrrhizinic acid which is insoluble in water and get precipitated. The precipitate clots and forms a sticky black sediment which is difficult to diffuse. The insoluble substances are not possessing flavouring properties and hence liquorice liquid extract is not useful as a flavouring agent in acidic mixtures. The prescription may be reffered beck to the prescriber for the change of flavouring agent. Certain salts like calcium chloride and magnesium sulphate cause partial precipitation of glycyrrhizin. These precipitates remain diffusible, hence method A(explained in Q. no. 07 in section-C) for precipitation yielding combination should be followed in order to minimize precipitation.

Question No. 14. What is the duty of pharmacist incase of the medicine is prescribed in over dose?

Ans: On receiving a prescription a pharmacist should not change his facial expression which gives an impression to the patient that he is surprised or confused after seeing the prescription. If in any case, over dose is prescribed then pharmacist should consult with prescriber without discussing with the patient.

Question No. 15. How are bulk powders packed and stored?

Ans: Powders are dispensed in bulk, when accuracy of dosage is not important. Bulk powder for internal use contains several doses of powder. They are packed in wide mouth containers that permit easy removal of a spoonful of powder. Bulk powders meant for external uses are non potent substances. These powders are packed in cardboard, glass or plastic containers, which are often designed for the specific method of application e.g. the dusting powder are dispensed in sifter-top containers or aerosol containers are dispensed in flat metal boxes with hinged lid.

Question No. 16. Explain why liniments should not be rubbed on broken skin.

Ans: Liniments are liquid or semi-liquid preparation meant for application to the skin. The liniments are usually applied to the skin with friction and rubbing of the skin. The liniments may be alcoholic or oily solution or emulsions. In alcoholic liniments, alcohol helps in the penetration of medicament into the skin and also increases its counter irritant and rubefacient action. In oily liniments, archis oil is commonly used which spreads more easily on the skin. Soap is also included as one of the ingredient in some of the liniments which help in easy application of liniments on the skin. A liniment should not be applied to the broken skin because it may cause excessive irritation as it contains soap, alcohol etc.

Question No. 17. Write brief about preservation of emulsion.

Or

Explain why the moulds require lubrication for oily or aqueous suppository bases.

Ans: Emulsions which are prepared by using emulsifying agent, such as carbohydrates, proteins, sterols and non-ionic surfactants may be lead to the growth of bacteria, fungi and moulds in the presence of water. The

contamination of emulsions by these micro-organisms may cause unpleasant odour, taste and discoloration. The following factors can help to maintain the stable emulsion:

1) Use thoroughly cleaned equipment and use ingredients of standard quality.

2) Maintain the prescribed ratio of oil, water and gum.

3) Use freshly boiled and cooled water to destroy micro-organism.

4) Use containers and closures of good quality.

5) Maintain the prescribed pH of the emulsion.

A suitable preservative is also included in the formulation of an emulsion. Benzoic acid (0.1-0.2%), methyl paraben and propyl paraben(0.1- 0.2%), chloroform(0.25%), chlorocresol(0.1%), cetrimide (0.002 to 0.01%) and phenylmercuric nitrate (0.004 to 0.01%) to make suitable emulsion.

Question No. 18. How is non-staining iodine ointment prepared?

Ans: Powder the iodine and shake with oil at room temperature until dissolved and maintain the solution at 50^{o}C with occasional stirring, until the brown color disappears. Add sufficient of the yellow soft paraffin (previously heated to 40^{o}C) to produce ointment having iodine content between 4.75 to 5.25%. Pour the mixed mass into a warm container and allow to cool without stirring to prevent an air being entrapped in the ointment. The fixed oil and fats obtained from vegetable and animal sources contain unsaturated constituents. The iodine combines with double bonds with unsaturated constituents and thus free iodine is not available so it leaves no stain when rubbed into the skin. Hence they are known as non-staining iodine ointment.

SECTION – C

Attempt any five questions. **5 x 5 = 15**

Question no. 01 Write in brief about various types of tests for identification of type of emulsion.

Question no. 02 Write about reasons responsible for therapeutic incompatibility in prescription.

Question no. 03 Write a short note on eutectic mixtures.

Question no. 04 What are hygroscopic and deliquescent powders?

Question no. 05 What are indiffusible solids. How you can prepare a good suspension with these solids?

Question no. 06 Define syrups and liniments.

Question no. 07 Write a short note on preparation procedure of for emulsion using dry gum method.

Question no. 08 Write a note on vanishing cream.

Question no. 09 What are pyrogens?

Question no. 10 Prepare 400ml of 70% alcohol from 95% alcohol.

Question no. 11 Calculate the quantity of sodium chloride require to prepare 200ml of 0.9% solution.

Question no. 12 How many proof gallons are contained in 4 gallons of 70% v/v alcohol.

Question no. 13 Prepare 500ml of 1 in 5000 solution of potassium permanganate.

Question no. 14 Differentiate the following: (a) Syrups & Elixirs (b) Cold cream & Vanishing cream (c) Flocculated & Non-flocculated Suspension (d) Creaming & Cracking (e) Emulsion & Suspension (f) Mouth washes & Gargles.

Question no. 15 Write note on (a) Wetting agent (b) Flocculating agent

Question no. 01 Write in brief about various types of tests for identification of type of emulsion.

Ans. Tests for identification of type of emulsion: The following tests are done to distinguish between o/w and w/o emulsion:

1) Dilution test: The emulsion is diluted with water. In case the emulsion remains stable after its dilution, it is o/w emulsion. The w/o emulsion breaks on its dilution with water but remain stable when diluted with oil.

2) Dye test: The scarlet red dye is mixed with the emulsion on a microscope slide and observed under microscope. If the disperse globules appear red and the continuous phase appears colourless, the emulsion is o/w type. The reverse condition occurs in w/o type emulsion i.e. the disperse globules appear colourless in the red 'back ground'.

3) Conductivity test: Water is a good conductor of electricity, whereas oil is non-conductor of electricity. The conductivity test can be performed by dipping a pair of electrodes connected through a low voltage bulb in the emulsion. If the bulb glows on passing the electric current, the emulsion is o/w type, because water is in the continuous phase. In case the bulb does not glow, the emulsion is w/o type, because oil is in the continuous phase.

4) Fluorescence test: Certain fixed oils possess the physical property of fluorescing in the presence of ultraviolet radiation. On microscopic observation of emulsion under ultraviolet, the whole field fluorescence indicates that oil is present in continuous phase and droplets fluorescence indicates that oil is present in disperse phase.

Question No. 02. Write about reasons responsible for therapeutic incompatibility in prescription.

Ans: Therapeutic Incompatibilities: When a drug is administered into the body of 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 is known as therapeutic incompatibility. This occurs due to the following reasons-

1) **Errors in the dosage:** Many therapeutic incompatibilities result from errors in writing or interpreting the prescription. The most serious type of dosage error in the dispensing is overdose of a medicament results in toxicity.

2) **Wrong dose or dosage form:** There are certain drugs which have quite similar names and there is always a danger of dispensing the wrong drug e g. prednisone and prednisolone, digoxin and digitoxin.

3) **Contra-indicated drugs:** There are certain drugs which may be contra-indicated in a particular disease or to a particular patient who is allergic to it example corticosteroids are contra-indicated in a patient having an active peptic ulcer.

4) **Synergistic and antagonistic drug:** When two drugs are prescribed together, they tend to enhance the activity of each other known as synergism example a combination of aspirin and paracetamol increases the analgesic activity. When two drugs having the opposite pharmacological effects are prescribed together shows antagonism example acetyl salicylic acid and probencid.

5) **Drug interactions:** The effect of one drug is altered by the prior or simultaneous administration of another drug. The drug interaction can be corrected by the proper adjustment of time of dosage form.

Question No. 03. Write a short note on eutectic mixtures.

Ans. Eutectic mixture: When certain low melting point solids are mixed together, a liquid or soft mass known as eutectic mixtures is produced. This occurs due to the lowering of the melting point of mixture to below room temperature and liberation of water or hydration. Such substances are called eutectic substances. e.g. menthol, thymol, camphor, phenol, salol, aspirin etc.

These substances can be dispensing by two methods:

1) Dispense as separate set of powders with directions that one set of each kind shall be taken as a separate dose,

2) An equal amount of any of inert absorbent like magnesium carbonate, light magnesium oxide, kaolin, starch, lactose, calcium phosphate etc are used in dispensing of such powder.

Question No. 04. What are hygroscopic and deliquescent powders?

Ans. The powders which absorb moisture from the atmosphere are called hygroscopic powders. But some powders absorb moisture to such a great extent that they go into solution and are called deliquescent powders examples ammonium chloride, iron and ammonium citrate, pepsin, Phenobarbitone, sodium bromide, sodium iodide, potassium citrate, zinc chloride etc.

Such substances are usually dispensed in granular form in order to expose less surface area to the atmosphere and these powders should not be finely powdered and such powder should be double wrapped. In humid weather or when dealing with very deliquescent substances, further wrapping in aluminium foil or plastic cover is advisable.

Question No. 05. What are indiffusible solids? How you can prepare a good suspension with these solids?

Ans. Indiffusible solids: Indiffusible solids are those substances which donot dissolve in water and do not remain evenly distributed in vehicle for sufficient long time to ensure uniformity of dose example calamine, aspirin, hydrocortisone, phenobarbitone etc.

Method of dispensing:

1) Finely powdered all the ingradients

2) Mix them together in a mortar and add compound tragacanth powder.

3) Measure ¾ of the vehicle and triturate to form a smooth cream.

4) Examine the suspension carefully and, if it contains any foreign particles, strain through a muslin piece into a tared bottle.

5) Rinse the mortar with small quantity of vehicle to clean it. Transfer the rinsings to the bottle.

6) Add any liquid ingredient.

7) Add more of the vehicle to produce the required volume.

Question No. 06. Define syrups and liniments.

Ans. Syrup: Syrup is concentrated or saturated solution of sucrose in purified water. The concentration of sugar is 66.7% w/w. Syrups are sweet viscous preparations. When syrups contain medicinal substances are called "medicated syrups" and those containing aromatic or flavoured substances are known as "flavoured syrups".

Liniment: Liniments are liquids and semi liquid preparations meant for external application to skin. Liniments are usually applied to skin with friction or rubbing. Liniments may be alcoholic or oily solutions or emulsions. Example: Camphor liniment-BP.

Question No. 07. Write a short note on preparation procedure of emulsion using dry gum method.

Ans. Preparaion of emulsion using dry gum method:

1) Measured the required quantity of oil in a dry measuring cylinder and transfer it into a dry mortar.

2) Add the calculated quantity of gum acacia into it and triturate vigorously so as to form a uniform mixture.

3) Add required quantity of water and triturate vigorously till a clicking sound is produced and product becomes white or nearly white due to the total internal reflection of light. The emulsion produced at this stage is known as primary emulsion.

4) Add more of water to produce required volume.

Question No. 08. Write a note on vanishing cream.

Ans. Vanishing creams: Vanishing creams are oil in water type emulsion which on application on skin leaves an almost invisible layer on it, therefore known as vanishing creams called vanishing cream does not produce any cooling effects. These creams are not quickly washed off with water due to presence of o/w emulsifiers. These are generally prepared by emulsification of stearic acid and water by means of alkalies such as sodium hydroxide, potassium hydroxide, borax etc. The main ingredient in vanishing cream is stearic acid which gives a thin white film of pearly white shining appearance to the cream, which on application gives a thin white film of free stearic acid. The consistency and texture of the cream also depends on the quantity of stearic acid, the amount of acid saponified and nature of alkalies used.

Question No. 09. What are pyrogens?

Ans. Pyrogens: Pyrogens are the metabolic product of microorganism and are produced by all microorganism, but gram negative bacteria produce most potent pyrogenic substances. Pyrogens are polysaccharides and thermostable. They are soluble in water and can pass through bacteria proof filters. They are unaffected by bactericide. Pyrogens increase the body temperature. Bacterial pyrogens include endotoxins and exotoxins, although many pyrogens are endogenous to the host. Pyrogens are also relatively thermally stable and insensitive to pH changes. Depyrogenation refers to the removal of pyrogens from solution, most commonly from injectible pharmaceuticals.

Question No. 10. Prepare 400ml of 70% alcohol from 95% alcohol.

Ans: Volume required = 400ml, Percentage of alcohol required = 75, Percentage of alcohol used = 95

By applying the formula:

$$\text{Volume of stronger alcohol to be used} = \frac{\text{Volume required x Percentage required}}{\text{Percentage used}}$$

$$= 400 \times 75/95 = 315.78\text{ml} = 316\text{ml}$$

316 ml of 95% alcohol is diluted with water to produce 400 ml. The strength of dilute alcohol will be 75%.

Question No. 11. Calculate the quantity of sodium chloride require to prepare 200 ml of 0.9% solution.

Ans: Calculation:-

100 ml solution of 0.9% w/v of NaCl is produced by adding = 0.9g of NaCl

1 ml solution of 0.9% w/v of NaCl is produced by adding = 0.9/100 of NaCl

200 ml solution of 0.9% w/v of NaCl is produced by adding = 0.9/100x 200

= 1.8g of NaCl

Hence 1.8gms of sodium chloride is dissolved in water to produce 200ml makes 0.9% w/v solution.

Question No. 12 How many proof gallons are contained in 4 gallons of 70% v/v alcohol.

Ans: Applying the formula:

Value in proof = % strength of alcohol x 1.75 – 100

= 70 x 1.753 – 100

= 22.71 O.P.

That means

100 gallons of 70% v/v alcohol = 122.71 units of proof spirit

1 gallons of 70% v/v alcohol = 122.71/100

4 gallons of 70% v/v alcohol = 122.71/100x4

= 4.90 gallons of proof spirit

Question No. 13 Prepare 500ml of 1 in 5000 solution of potassium permanganate.

Ans: Calculation:- Volume required = 500ml

Percentage of potassium permanganate solution required to be prepared = 1 in 5000

= 1/5000 x 100 = 0.02%

To prepare 100ml of potassium permanganate solution add = 0.02g of potassium permanganate

To prepare 1ml of potassium permanganate solution add = 0.02/100g

To prepare 500ml of potassium permanganate solution add = 0.02/100 x 500

= 0.1g of potassium permanganate

Question no. 14. Differentiate the following: (a) Syrups & Elixirs (b) Cold cream & Vanishing cream (c) Flocculated & Non-flocculated Suspension (d) Creaming & Cracking (e) Emulsion & Suspension (f) Mouth washes & Gargles

Ans: (a) Syrups & Elixirs

Syrups	Elixirs
1. Syrups are a concentrated or nearly saturated solution of sucrose.	1. Elixirs are sweetened, aromatic and hydro-alcoholic preparation.
2. The concentration of sucrose is fixed that is 66.7 %w/w.	2. The concentration of sucrose may varies from preparation to preparation.
3. Syrups can be prepared by different methods such as simple solution method, by extraction and by chemical interaction.	3. Elixirs can be prepared by simple solution method.
4. No preservative is needed.	4. To prevent the growth of micro-organism preservatives are added.

Ans: (b) Cold cream & Vanishing cream

Cold creams	Vanishing creams
1.Cold creams are emulsion which on application on skin produced cooling effects due to evaporation of water.	1. Vanishing creams are emulsion which on application on skin does not produce any cooling effects.
2. It may leave a visible or invisible layer on skin.	2. It leaves an almost invisible layer on skin.
3. These are generally prepared by emulsification of oils and water.	3. These are generally preparaed by emulsification of stearic acid and water.
4. These are o/w type emulsion but after application on skin, phase inversion occurs to w/o type emulsion.	4. No such phenomena is occur in vanishing creams.
5. These creams are not quickly washed off with water.	5. These creams are quickly washed off with water.

Ans: (c) Flocculated & Non-flocculated Suspension

Flocculated suspension	Non-flocculated suspension
1. Particles form loose aggregates and form a network like structure.	1. Particles exist as separate entities.
2. The rate of sedimentation is high.	2. The rate of sedimentation is slow.
3. Sediment is rapidly formed and easy to redisperse.	3. Sediment is slowly formed and difficult to redisperse.
4. Sediment is very loosely packed and does not form a hard cake.	4. Sediment is very closely packed and forms a hard cake.
5. Supernatent liquid is clear.	5. Supernatent liquid is not clear.
6. The floccules stick to the side of the bottle.	6. The floccules do not stick to the side of the bottle.
7. Suspension is not pleasing in appearance.	7. Suspension is pleasing in appearance.

Ans: (d) Creaming & Cracking

Creaming	Cracking
1. Creaming is the upward movement of dispersed phase to form a thick layer at the surface of the emulsion.	1. Cracking means the separation of dispersed phase and dispersion medium.
2. Creaming is temporary separation of two phases.	2. Cracking is permanent separation of two phases.
3. Separated phase is redispersed by mild shaking or stirring.	3. Separated phase is difficult to redisperse by shaking.
4. Rate of creaming is depends on Stoke's law.	4. Rate of cracking does not depends on stoke's law.

Ans: (e) Emulsion & Suspension

Emulsion	Suspension
1. An emulsion is a biphasic liquid preparation containing two immiscible liquids, one of which is dispersed as globules in to the other.	1. These are the biphasic liquid dosage form of medicament in which the finely divided solid particles are dispersed in a liquid or semisolid vehicle.
2. The globule size of the dispersed liquid is in the range of 0.25 to 25µm.	2. The particles size of the suspended solids is in the range of 0.5 to 5 µm.
3. The emulsifying agent is required to make a stable emulsion.	3. The suspending agent is required to make a stable emulsion.
4. Emulsion are of two types i.e. O/W and W/O type.	4. Suspension are of two types i.e. flocculated and non-flocculated.
5. There are several tests to confirm the type of emulsion.	5. There is no test to confirm the type of suspension.

6. During storage, freezing should be avoided as it may lead to cracking of emulsion.	6. During storage, freezing should be avoided as it may lead to aggregation of suspended particles.

Ans: (f) Mouth washes & Gargles

Gargles	Mouth washes
1. Gargles are aqueous solution used to treat throat infection.	1. Mouth washes are aqueous solution with a pleasant taste used to make a clean and deodorise the buccal cavity.
2. Phenol or thymol is generally present in gargles.	2. Phenol or thymol may be present in gargles.
3. Gargles are always dispensed in concentrated form.	3. Mouth washes are generally dispensed in concentrated form.
4. Gargles are complex preparation in formulation.	4. Mouth washes are simple preparation in formulation.

Question no. 15 Write note on (a) Wetting agent (b) Flocculating agent

Ans: (a) Wetting agent: These are the agents which reduces the interfacial tension between the solid particles and liquid medium, thus producing a suspension of required quality. This may be achieved by adding a suitable wetting agent which is absorbed at the solid- liquid interface in such a way that the affinity of the particles for surrounding medium is increased and the particular force is decreased e.g. alcohol in tragacanth mucilage, glycerin in sodium alginate or bentonite dispersion and polysorbate in oral and arenteral suspension.

b) Flocculating agent: In suspension, the solid particles are well dispersed in dispersion medium. The dispersion can be improved by adding a surfactant or protective colloid which acts as flocculating agent. The flocculating agent acts by reducing the surface tension and thereby improving the dispersion of solids and minimize flocculation examples sodium lauryl sulphate, tweens, spans, and carbowaxes etc.

SECTION-D

Attempt any three questions. **3x10=30**

Question no. 01 What are ointments? Discuss the various methods of the preparation of ointments.

Question no. 02 What are suppositories? Discuss the various tests performed for the evaluation of suppositories. Explain various factors affecting drug absorption from rectal suppositories.

Question no. 03 What are shampoos? Describe the properties of a good shampoo and give the types of shampoo. Explain various type of additives used in the preparation of shampoos.

Question no. 04 Discuss the various tests performed in the evaluation of parenteral products.

Question no. 05 What is prescription? Describe various part of a prescription.

Question no. 06 Define incompatibility and discuss various types of incompatibilities.

Question no. 07 Describe powders, classify and discuss advantages and disadvantages.

Question no. 08 Write a note on ophthalmic products

Question no. 09 Describe in brief about effervescent granules. Give the methods of preparation of effervescent granules.

Answers:

Question no. 01 What are ointments? Discuss the various methods of the preparation of ointments.

Ans: Ointment are semi-solid preparation meant for external applications to the skin or mucous membrane. The ointment base is that substance or part of an ointment, which serve as carrier or vehicle for the medicament.

Methods of preparation of ointment: The ointment can be prepared by any one of the following methods:
(i) Trituration Method (ii) Fusion Method (iii) Chemical reaction Method (iv) Emulsification Method

(i) Trituration Method: It is most commonly used method for preparation of ointments. This method is used when the base is soft and the medicament is insoluble in the base. The procedure of preparing the ointment by this method is that first of all, finely powdered the solid medicament then weighed the required quantity of an ointment base. Triturate the solid medicaments with a small amount of base on ointment slab with the help of a stainless steel ointment spatula until a homogenous product is formed. Finally add remaining quantities of the base until the medicament is uniformly mixed with it. Incorporate any liquid ingredient if present.

(ii) Fusion Method: It is generally used to prepare the non-medicated preparations. The ingredients used should be resistant to heating. Formulations are melted on water bath in a porcelain china dish because it does not react with the ingredients. After melting, cool the method mixture and stir it continuously with a glass rod and dispensed.

(iii) Chemical Reaction Method: Certain chemical reactions are involved in the preparation of several ointments. For example in Ointment containing free iodine, iodine is slightly soluble in most of the fats and vegetables oils. But it is readily soluble in concentrated potassium iodide solution in water, due to formation of polyiodides. These polyiodides are readily soluble in water, alcohol and glycerin. There solutions may be incorporated with the absorption type ointment base.

(iv) Emulsification methods: In this method, the fats, oil and waxes are melted together on a water bath at a temperature 70^0c. Solution of all of the heat stable water soluble components is also heated almost at the same temperature as that of melted bases. This solution is slowly added to the melted bases with continuous stirring until the product cools down and semisolid mass (ointment) is prepared.

Question no. 02 What are suppositories? Discuss the various tests performed for the evaluation of suppositories. Explain various factors affecting drug absorption from rectal suppositories.

Ans: 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.

Evaluation of suppositories: Each manufactured batch of suppositories must be tested to ascertain whether the required standards are met or not. A visual examination must be carried out for general appearance and medicated suppositories should be sliced longitudinally to determine uniform distribution of medicament.

Various tests are performed to evaluate the suppositories:

1) **Determination of melting range:** This test is carried out to know whether suppositories melt at required temperature range or not. Test is done by using melting range device and this test is necessary only for hydrophobic base containg suppositories.

2) **Determination of the disintegration/ dissolution time:** The disintegration and dissolution time can be determined by use of the equipment available for these tests with necessary modification in test media.

3) **Fragility assessment:** Fragility is tested to determine the tensile strength of the suppositories to assess whether it will be able to withstand the rigours of normal handling or not.

4) **Drug uptake rates/ *In-vitro, in-vivo* testing:** The suppositories carrying medicaments for systemic action should subjected to in vitro and in vivo tests for drug uptake. In the *in vitro* method after bringing the suppositories in contact with the simulated fluids, Small portions are withdrawn at definite intervals of time and drug released is noted. In the *in vivo* methods, are administered to experimental animals the suppositories and drug concentration in their plasma or urine is determined after specified intervals of time.

Factors affecting the rate of absorption: The absorption of systemically-active drugs from suppositories involves release in the rectum, diffusion to the rectal mucosa, absorption by tissues and transport into general circulation. The various factors affecting drug absorption from rectal suppositories are:

(i) **Partition co-efficient of drug:** Drugs with a high fat to water partition coefficient are liberated slowly from fatty base. Partitioning between base and rectal fluid is also affected by the extremely variable volume of water in the rectum at different times in different individuals, this volume is often very small. Formulation of a medicament in a different base may also alter release and absorption rates.

(ii) **pH of rectal secretions:** The principal method of drug absorption is diffusion through lipid regions of cell membranes and therefore, unionized drugs, which are more soluble in lipids than the ionized forms, are absorbed more readily. The rate of ionization of a drug depends on the pH of the environment, Acidic and basic drugs being most ionized so least absorbed at high and low pH.

(iii) **Physical state of medicament:** The absorption of a medicament in suspension is limited by its dissolution rate therefore when a drug is formulated as a suspension in the suppositories, it is advantageous to use a fine powder to increase surface area and enhance dissolution and absorption. This precaution is particularly relevant to rectal dosage forms because rectum lacks the large surface area and considerable movement of contents. Generally, a fatty base is more suitable for medicaments required to acts locally while a water – miscible or water soluble base is better for providing the quick release.

(iv) **Presence of adjuvant in base:** Emulsifying agents such as emulsifying wax, wool fat, wool alcohols, macrogol stearates and polysorbate, may be included in suppositories bases to facilitate incorporation of

aqueous solution or polar liquids. The presence of emulgents may complicate preparation of suppositories by causing foams in the base and bubbles in the products.

The major limiting factor in rectal absorption appears to be the rate at which the drug diffuse to the rectal mucosa. Therefore, if a high blood concentration of a systemically active drug is required, rapid release from the suppository is essential.

Question No. 03. What are shampoos? Describe the properties of a good shampoo and give the types of shampoo. Explain various type of additives used in the preparation of shampoos.

Answer: Shampoo: It may be defined as preparation containing surface-active agents that are used to remove dirt, grease and debris from the hair, scalp and other parts of body without affecting the natural structure of hair.

Properties of a good shampoo:

1) It should be capable of removing grease, dirt and skin debris from the hair and scalp.
2) It should be non –toxic and non-irritant.
3) It should provide sufficient fragrance to the hair after its use.
4) It should be effective in small amount.
5) It should get easily removed by washing with water.
6) It should produce sufficient foam, both in hard and soft water.
7) It reduces the fluffing and smoothen the hair shafts. It makes the hair soft and shiny.

Types of shampoos: The shampoos are available in market in different forms which are as under: -

(1) Medicated Antidandruff shampoos (2) Powder shampoos (3) Clear liquid shampoos (4) Gel shampoos (5) Soap shampoos (6) Cream or paste shampoos (7) Lotion shampoos (8) Baby shampoos (9) Aerosol shampoos

Additives of shampoos:

(1) Conditioning agents: These are used in lubricating the hair and improve the texture of the hair. It makes the hair soft and shiny e.g. Lanolin and its derivatives, glycerin and propylene glycol are used as hair conditioners.

(2) Thickening agents: These are used to increase the viscosity of the shampoos and provide the desired consistency to the preparation e.g. methyl cellulose and sodium alginate.

(3) Solubilizing agents: These are used to solubilize poorly soluble substances to get a clear shampoo example ethyl alcohol, glycerol, propylene glycol.

(4) Opacifying agents: These are used to make the shampoo opaque e.g. glycol, cetyl alcohol.

(5) Preservatives: These are required to preserve the preparation against bacteria by adding preservatives example methyl paraben and propyl paraben.

Question No. 04. Discuss the various tests performed in the evaluation of parenteral products.

Ans: The finished parenteral products are subjected to the following tests, in order to maintain quality control: (1) Sterility test (2) Clarity test (3) Leakage test (4) Pyrogen test (5) Quantitative Assay method.

(1) Sterility testing: All the parenteral preparations which are supplied in sterile form must confirm to the test for sterility as prescribed in the pharmacopoeia. Test for sterility is intended for detecting the presence of viable forms of bacteria, fungi and yeasts in preparations, which are required to be sterile.

Principle: The test is based on the principle that if bacteria or fungi are placed in a medium, after providing the favorable conditions, and kept at a favorable temperature, the organism will grow and their presence can be indicated by turbidity in the clear medium.

Method of testing: test for sterility may be carried out by membrane filtration method or Direct inoculation method.

The test samples of parenteral preparation are transferred into test tubes containing sterile culture media for aerobic, anaerobic bacteria and fungi. These test tubes are incubated for stated period in the incubator. The presence of turbidity in the culture media indicates the growth of micro-organisms and the sample fails to comply with test for sterility. This can be confirmed by repeating the test.

(2) Clarity test: Clarity test is performed to ensure that the parenteral products are free from foreign particles. Each parenteral preparation in its final containers is subjected individually to a visual inspection to check out the possibility of foreign particles. The contents of the containers are slowly inverted and rotated in front of black and white screen, for detection of light and dark coloured particle. The solution is examined for the presence of foreign particles. If any foreign matter is visible, sample is rejected.

(3) Leakage test: This test is performed for ampoules that have been sealed by fusion to ensure that there should not be any leakage in them. Leakage test is performed in vacuum chamber the ampoules are dipped in 1% soln of methylene blue in vacuum chamber and vacuum is applied. When vacuum is released the coloured solutions will enter the ampoule with defective sealing. The presence of dye in the ampoule confirms the leakage and hence sample will be rejected.

(4) Pyrogen testing: Pyrogen test is done to check the presence or absence of pyrogen in all aqueous parenteral preparations. Pyrogen is the metabolic byproducts of microorganism and is produced by all microorganisms.

Principle: The test involves the measurement of rise in body temperature of rabbit following intravenous injection of a sterile solution of product being examined. Rabbits are used to perform this test because their body temperature increases when pyrogen is introduced into their bodies by parenteral route. Increase in body temperature of rabbit shows the presence of pyrogen in parenteral formulation.

(5) Quantitative Assay Method: Assay is performed according to the method given in the monograph of that parenteral preparation in the pharmacopoeia. Assay is done to check the quantity of medicament present in the parenteral preparation.

Question no. 05 What is prescription? Describe various part of a prescription.

Ans: Prescription is an order written by a physician, dentist or any other registered medical practitioner to a pharmacist to compound and dispense a specific medication for the patient. It acts as a common link between the practitioner, pharmacists and patient. It consists of RMP's directions for the pharmacist and patient about the formulation.

Parts of a prescription:

(1) Date: Date must be written on the prescription by the prescriber at the same time when it is written. It helps a pharmacist to find out the date of prescribing and date for filling the prescription.

(2) Name, age, sex and address of the patient: Name, age, sex and address of the patient must be written on the prescription because it serves to identify the prescription. Age and sex of the patient especially in case of children helps the pharmacist in checking the medication and dose.

(3) Superscription: The superscription is represented by a symbol Rx which is always written at the beginning of the prescription. In the olden days, the symbol was considered as a prayer to Jupiter, the God of healing, for quick recovery of the patient but now this symbol is understood as an abbreviation of the Latin word recipe, meaning ' to take'.

(4) Inscription: This is the main part of prescription. It contains the names and quantities of the prescribed ingredients. In complex prescription containing several ingredients the inscription is divided into three parts.

Base: The active medicaments which are intended to produce the therapeutic effect.

Adjuvant: It is included to enhance the action of the medicament.

Vehicle: It is either used to dissolve the solid substances or to increase the volume of preparation.

(5) Subscription: This part of prescription contains direction to the pharmacist regarding the dosage form to prepare and number of doses to be dispensed.

(6) Signature: It consists of the directions to be given to the patient regarding the administration of drug. It is usually written as 'Sig'.

(7) Renewal instructions: It has been indicated on every prescription, whether it may be renewed and if so, then how many times. It is very important particularly in the prescription containing the narcotic and other habit forming drugs to prevent its misuse.

(8) Signature, address and registration number of the prescriber: All other part of the prescription may be printed or type written but the prescriber name must be hand written and should be signed with ink. The prescription containing narcotic or other habit-forming drugs must bear the address and registration no. of the prescriber also.

Question No. 06 Define incompatibility and discuss various types of incompatibilities.

Ans: Incompatibility occurs as result of mixing of two or more antagonistic substances and an undesirable product is formed which may affect safety, efficacy and appearance of the pharmaceutical preparations.

Types of incompatibility: (1) Physical incompatibility (2) Chemical incompatibility (3) Therapeutic incompatibility

(1) Physical incompatibility: When two or more than two substances are combined together physical change takes place and an unacceptable product is formed. Physical incompatibility is usually due to immiscibility, insolubility, precipitate formation or liquefaction of solid materials. For example:

Immiscibility: Oil and water are immiscible with each other. They can be made miscible water by emulsification.

Insolubility: Insolubility means the inability of material to dissolve in a particular solvent system. In the liquid preparation containing indiffusible solids, a suspending agent is incorporated to increase the thickness of the preparation.

Precipitation: A drug in solution may be precipitated, when it is mixed with a solvent e.g. resins are insoluble in water. Precipitation can be avoided by slowly adding the undiluted tincture with vigorous stirring to the diluted suspension or by adding some suitable thickening agent.

Liquefaction: When certain solids having low melting point are mixed together, a liquid or soft mass known as eutectic mixtures is produced. This occurs due to the lowering of the melting point of mixture than room temperature and liberation of water of hydration takes place.

(2) Chemical incompatibility: It may be as a result of chemical interaction between the ingredients of a prescription and a toxic or inactive product may be formed. It is of two types.

Tolerated: In this, the chemical interaction can be minimized by changing the order of mixing but no alteration is made in the formulation.

Adjusted: In this, the chemical interaction can be prevented by addition or substitution of one of the reacting ingredients of a prescription with another of equal therapeutic value.

Precipitate yielding interactions: In chemical incompatibilities sometimes ppt. may also be formed.

The Precipitate formed may be diffusible or indiffusible. The method A and B is used in dispensing the prescription yielding diffusible and indiffusible precipitates respectively.

Method A-The method is followed when diffusible precipitates are formed in very small quantity. Divide the vehicle into two equal portions. Dissolve one of the reacting substances in one of the portion and other in the other portion. Mix the two portions by slowly adding one portion to the other by rapid stirring.

Method B- This method is followed when indiffusible precipitates are formed in large quantity. Divide the vehicle into two equal portions. Dissolve one of the reacting substances in one of the portion. Weigh a suitable quantity of compound tragacanth powder and transfer in a mortar and use part of second portion of vehicle to produce smooth mucilage. Mix the two portions by slowly adding one portion to the other with rapid stirring.

Example of chemical incompatibilities

(a) Alkaloidal salts with alkaline substances: Alkaloids are weak bases. They are almost insoluble in water but alkaloid salts are soluble in water. If these salts are dispended with alkaline preparations such as strong solution of ammonium acetate, ammonium bicarbonate, the free alkaloid may be precipitated asdiffusible precipitate. Hence method A can be used.

(b) Alkaloidal salts with soluble iodides: When the alkaloidal salts react with soluble iodide, they form the diffusible precipitates so method A is applicable.

(c) Soluble salicylate with alkali bicarbonates: When sodium salicylate is administered orally it reacts with hydrochloric acid present in the stomach to form salicylic acid, which is precipitated and may irritate the gastric mucosa, causing pain in the stomach. If sodium salicylate is prescribed, it is usually given along with double quantity of sodium bicarbonates. Because sodium bicarbonate to partially neutralize the gastric juice and thus minimizing the formation of salicylic acid.

(3) Therapeutic incompatibilities: When a drug is administered into the body of a patient to produce a specific degree of pharmacological action, but the nature or intensity of the action produced is different from that intended is called therapeutic incompatibilities.

Errors in the dosage: Many therapeutic incompatibilities result from errors in writing or interpreting the prescription. The most serious type of dosage error in the dispensing is overdose of a medicament results in toxicity.

Error in dosage form: There are certain drugs which have quite similar names and there is always a danger of dispensing the wrong drug e g. prednisone and prednisolone, digoxin and digitoxin.

Contra-indicated drugs: There are certain drugs which may be contra-indicated in a particular disease or a particular patient who is allergic to it e g. corticosteroids are contra-indicated in a patients having an active peptic ulcer.

Synergistic and antagonistic drug: Many drugs exhibit synergism and antagonism when administered in combination. When two drugs are prescribed together, they tend to enhance the activity of each other known as synergism e g. a combination of aspirin and paracetamol increases the analgesic activity. When two drugs having the opposite pharmacological effects are prescribed together shows antagonism e g. acetyl salicylic acid and probencid.

Drug interactions: The effect of one drug is altered by the prior or simultaneous administration of another drug. The drug interaction can be corrected by the proper adjustment of dosage e g. acetophenetidin and asprin are analgesic but acetophenetidin depresses the CNS so asprin can be used instead of acetophenetidin.

Question no. 07 Describe powders, classify and discuss advantages and disadvantages.

Ans: Powder is mixture of finely divided drug used in dry form. These are solid dosage forms of medicament, which are meant for internal and external use.

Types of powders:

1) Bulk powder for internal use.

2) Bulk powder for external use.
3) Simple and compound powder for internal use.
4) Powders enclosed in cachets and capsules.
5) Compressed powder (tablets)

(1) Bulk powder of internal use: Powders are dispensed in bulk, when accuracy of dosage is not important. Bulk powder contains several doses of powder. They are supplied in wide-mouth containers that permit easy removal of a spoonful of powder. Example: powder for laxative purpose.

(2) Bulk powder for external use: Bulk powders meant for external use are non-potent substances. These powders are supplied in cardboard, glass or plastic containers. The bulk powders, which are commonly used for external applications, are: Dusting powder, Insufflations, Snuffs, Dentifrices

(3) Simple and compound powders for internal use: Simple powder contains only one ingredient either in crystalline or amorphous form. Compound powder contains two or more than two substances which are mixed together and then divided into desired number of individual doses.

(4) Powder enclosed in cachets: Cachets are the solid unit dosage form of drugs these are moulded from rice paper. These are used to enclose nauseous or disagreeable powders. These are also known as wafer-capsule.

Advantages of powder

1) Powders are one of the oldest dosages form and used both internally and externally.
2) Powders are more stable than liquid dosage form.
3) It is convenient for the physician to prescribe a specific amount of powdered-medicament depending upon the need of the patient.
4) The chances of incompatibility are less as compared to liquid dosage form.
5) The onset of action of powdered drug is rapid as compared to other solid dosage form, e.g. tablets, capsules or pills.
6) Powders are easier to carry than the liquid dosage forms.
7) Large quantity of powdered drugs can be easily administered in a suitable liquid.
8) Small children and elder patients cannot swallow solid dosage forms, such as, tablets and capsules. They can easily take the powdered drug as such or dispersed in water or any other liquid.
9) Powders are more economical as compared to other solid dosage form, because these are prepared extemporaneously without involving any special machinery and techniques.

Disadvantages of powders

1) Drugs having bitter, nauseous and unpleasant taste cannot be dispensed in powdered form.
2) Deliquescent and hygroscopic drugs cannot be dispensed in powder.
3) The dispensing of powder is a time consuming.

Question no. 08 Write a note on opthalmic products.

Ans: Ophthalmic products are the sterile products, meant for instillation into the eye in the space between the eye lids and the eye balls. These products must be sterile and are prepared under the same conditions and by the same methods as other parenteral preparations. Ophthalmic products include:-

(a) Eye-lotions: These are the sterile aqueous solution used for washing of the eyes. The eye lotion are supplied in concentrated form and required to be diluted with warm water immediately before use. They are usually applied with a clean bath or sterile fabric dressing and a large volume of solution is allowed to flow quickly over the eye. Eye lotion should be isotonic and free from foreign particles to avoid irritation to the eye. They are required to prepare fresh and should not be stored more than two days as the lotion may get contaminated with micro-organism.

(b) Eye-ointments: Eye ointments are sterile preparation meant for application to the eye. These are prepared under aseptic conditions and packed in sterile collapsible tubes which keep the preparation sterile until whole of it is consumed.

(c) Eye-suspensions: Eye suspensions are not commonly used as compared to eye drops. They are prepared only in that case, when the drug is insoluble in the desired vehicle or unstable in liquid form.

(d) Eye drops: Eye drops are sterile aqueous or oily solutions or suspensions of drugs that are instilled into the eye with a dropper. They usually contain drugs having antiseptic, anti-inflammatory, mydriatic properties.

(e) Contact lens solution: Wearer of contact lenses generally uses two solutions:
Wetting solution: It is used primarily for treating the lenses before insertion. Due to hydrophobic nature of hard lenses they are poorly wetted by lachrymal fluid of the eye. Hence, the contact lenses require moistening with a wetting agent to make the insertion easy and comfortable. The formulation of contact lens solution may contain a wetting agent, thickening agent, antimicrobial agent etc.
Storage solution: It is used for overnight cleansing, soaking and storage. The contact lenses after its removal from the eye are cleaned with wetting solution and rinsed with purified water. Then they are stored in a storage solution to prevent dehydration.

Question no. 09 Describe in brief about effervescent granules. Give the methods of preparation of effervescent granules.

Ans: The effervescent granules are the specially prepared solid dosage form of medicament meant for internal use. They contain a medicament mixed with citric acid, tartaric acid and sodium bicarbonate. Sometimes saccharin or sucrose may be added as a sweetening agent. Before administration, the desired quantity is dissolved in water, the acid and bicarbonate react together producing effervescence.

Advantage:

1. The carbonated water produced from release of carbon dioxide serve to mask bitter & saline taste of drugs.
2. Carbon dioxide stimulates the flow of gastric juice and helps in absorption of medicament.

Method of preparation of effervescent granules:

1) Heat method: A large porcelain or stainless steel evaporating dish is placed over the boiling water bath. The dish must be sufficiently hot before transferring the powder into it, to ensure liberation of the water of crystallization from citric acid. If heating of the dish is delayed, the powder which is added to it, will heat up slowly and the liberated water of crystallization will go on evaporating simultaneously.

2)Wet method: In this method, the mixed ingredients are moistened with a non aqueous liquid (e. g. alcohol) to prepare a coherent mass which is then passed through a number 8 sieve and dried in an oven at a temperature not exceeding 60^0C. The dried granules are again passed through the sieve to break the lumps which may be formed during drying. The dried granules are packed in air tight container for example ENO.