WINTER-15 EXAMINATION

Subject Code: **0811** **Model Answer** Page No:01/ 32

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.

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Q.1 Attempt any EIGHT (2marks each)

a) Translate following terms in English (0.5 mark for each)

i) More dicto **:** As directed

ii) Dolore urgente **:** When the pain is severe

iii) Hora somni **:** At bed time/Just before sleep

iv) Si opus sit **:** When required/When necessary

b) What is 'Herapath Reaction' ? (2 marks).

Oxidation of iodides with quinine sulphate : Quinine sulphate is not freely soluble in water.it is made soluble in presence of sulphuric acid. The sulphuric acid librates hydroiodic acid from the potassium iodide and the hydroiodic acid is partly oxidized by the sulphuric acid, yielding iodine. The iodine, hydroiodic acid and quinine sulphate then combine to form a compound called 'herapathite or iodosulphite of quinine'.

c) Calculate the dose of "Acetamenophen" for child of 6 yrs.by Young's formula. (Adult dose = 1000mg). (Formula 0.5M, 1.5 for calculation = 2 marks).

Young's formula Dose for child = Age in years/ Age + 12 X Adult dose

= 6/6+12 X 1000 mg

= 333.33 mg.

d) Give metric equivalent (0.5 mark for each)

i) Grain = 64.8mg/60mg/65mg

ii) Fluid ounce = 30ml/28.8ml

iii) Drachm = 4gms/3.6gms

iv) Minim = 0.06ml

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e) Differentiate between suppositories and pessaries (0.5 X 4 =2M)

Suppositories	Pessaries
They are solid dosage form meant for insertion into body cavities other than mouth	They are solid dosage form meant for insertion into the vagina
They are available in different shapes sizes and weight	They are available in conical, wedge shape or rod shape
The weight differs depending on purpose for which it is use	The weight ranges from 4 to 8gms
Base used mostly cocoa butter	Base used glycerol-gelatin
Suppositories used for systemic and local action	Pessaries are used only for local action.
Ex. Dulcolax suppositories	Ex. Fluconazole pessaries.

f) Define (1 mark for each)

i) Elixir: Elixir are clear, sweetened, aromatic hydro alcoholic liquids intended for oral use. May be medicated or non medicated.

ii)Gargles: Gargles are clear aqueous solution used to prevent or treat throat infection they are usually available in concentrated form with direction for dilution with warm water before use.

g) Give any two examples of Emulsifying Agents and Preservatives used in emulsion.

Emulsifying Agents: Gum acacia, Tragacanth, Methyl cellulose, Starch. Etc **(0.5 X 2 = 1 Marks)**

Preservatives: Benzoic acid, methyl paraben, Propyl paraben, chloroform, Chlorocresol, Cetrimide, Phenylmercuric nitrate.Etc. **(0.5 X 2 = 1 Marks)**

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h) Give any four ideal properties of ointment base. (0.5 X 4 = 2 Marks)

- it should be inert, odourless and smooth
- it should be physically and chemically stable
- it should be compatible with skin and with the incorporated medicaments
- it should be of such a consistency that it spreads and softens when applied to the skin with stress
- it should not retard healing of the wound
- it should not produce irritation or sensitisation of the skin

i) Name any four tests used for evaluation of parenteral product.(0.5 x 4 = 2 marks).

1. Sterility test.
2. Clarity test.
3. Leakage test.
4. Pyrogen test
5. Assay.

j) Write any four Ideal qualities of lipstick. (0.5 x 4 = 2 marks).

1. It should be non toxic and non irritating
2. It should be free from gritty particles
3. It should be easily applicable and removable
4. It should give shiny and smooth appearance
5. It should not dry on storage
6. It should be long lasting after application
7. The stick should not break during application
8. It should be stable both physically & chemically.
9. It should be free from sweating
10. It should maintain its firmness till it is fully used up.

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k) Why throat paints are viscous in nature? (2 marks)

Throat paints are viscous because medicaments adhere to mucous membrane for long period which helps to prolong the time period of the drug to remain in contact with the mucosa. It also provides sweat taste to the preparation.

l) What are dentifrices? Name any two ingredients used in it. (1 marks for definition, 1 mark for each ingredient.)

Dentifrices are the preparation meant to be applied to the teeth with a tooth brush for the purpose of cleaning the accessible surface of the teeth.

Ingredients used:

- Abrasives –Calcium carbonate, calcium phosphate, magnesium trisilicate etc.
- Binders – Gum tragacanth , sodium alginate, methyl cellulose etc.
- Detergents – Sodium lauryl sulphate, sodium alkyl sulphosuccinate.
- Flavouring agent – Cinnamon oil , eucalyptus oil
- Humectants – Glycerin, propylene glycol
- Preservatives – Methyl paraben, Propyl paraben.
- Sweetening agent – Saccharin
- Therapeutic agents – antibiotics, fiuorides.

Q.2 Attempt any Four of the following 12

a) Define Incompatibility. Describe Therapeutic incompatibility with example.

(Definition 1 mark, any one descriptions with example 2 mark)

Incompatibility:-

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

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.

This occur due to the following reasons:

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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 aspirin & 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 or any food items & it is corrected by proper adjustment of dosage, or appropriate directions. For e.g.

Rx

Tetracycline HCL---------- 250mg

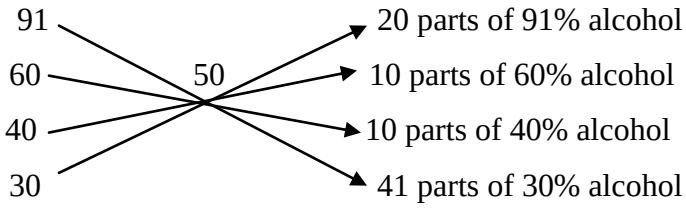
Send 10 capsules.

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 refer back to the physician.

b) In what volume 30%, 40%, 60%, and 91% alcohol be mixed to get 300 ml of 50% alcohol? (1 mark for alligation method, 2 marks for volume calculation)

By using the alligation method:



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81 Total parts

Therefore, when 20 parts of 91% alcohol,10 parts of 60% alcohol,10 parts of 40% alcohol 41 parts of 30% alcohol are mixed together, the resulting solution will produce 50 % alcohol.

i) Volume of 91% alcohol required

= 81parts **:** 300 ml **::** 20 parts **:** V

$$V = \frac{300 \times 20}{81} = \frac{6000}{81} = 74.07 \text{ ml}$$

ii) Volume of 60% alcohol required

=81 parts **:** 300 ml **::** 10parts **:** V

$$V = \frac{300 \times 10}{81} = \frac{3000}{81} \quad 37.037\text{ml}$$

iii) Volume of 40% alcohol required

= 81 parts **:** 300 ml **::** 10 parts**:** V

$$V = \frac{300 \times 10}{81} = \frac{3000}{81} = 37.037\text{ml}$$

iv) Volume of 30% alcohol required

= 81parts **:** 300 ml **::** 41 parts**:** V

$$V = \frac{300 \times 41}{81} = \frac{12300}{81} = 151.85\text{ml}$$

Therefore, 74.07 ml of 91% alcohol

37.037ml of 60% alcohol

37.037ml of 40% alcohol

151.85ml of 30% alcohol are mixed to get 300 ml of 50% alcohol.

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c) Describe in detail about "Effervescent Granules".(1mark for definition,2marks for methods)

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

Functions effervescent granules 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

Method of preparation:

1) Heat method:

Method of preparation :

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 of the dish is delayed ,the powder which is added to it , will heat up slowly and the liberated water of crystallisation will go on evaporating simultaneously. As a result sufficient water will not be available to make coherent mass.

The water needed for granulation is provided from two sources

i) From water of crystallization of citric acid.

The citric acid contains one molecule of water of crystallization which is liberated during heating.

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

Sodium Bicarbonate	Citric acid	Sodium citrate	Carbon dioxide	Water

ii)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 bicarbonate	Tartaric acid	Sodium tartarate	Carbon dioxide	Water

3) Generally heating takes 1 to 5 minutes. The damp mass is then passed through sieve dried in an oven temperature not exceeding 60^0C.

2) Wet method:

i) The mixed ingredients are moistened with a non aqueous liquids to prepare a coherent mass.

ii) It is then passed through a sieve no.8& dried in an oven at temperature not exceeding 60^0C.

iii) The dried granules then passed through the sieve to break the lumps which may be formed during drying.

iv) Then packed in air tight containers.

d) Explain "Formulation of Mixtures."

Formulation of Mixture:

a. Vehicles: following vehicles are used**.(1M)**

- Water: purified water
- Aromatic water: Multiple use, e.g. chloroform water, Cinnamon water, etc.
- Medicated vehicle: Infusions, ex. Senegal infusion as expectorant.

b. Adjuncts: Adjuncts are generally used to improve the Safety, efficacy and palatability. **(0.5 X 4 = 2M)**

1. Chemical Stabilizers: e.g. Antioxidant: Ascorbic acid (0.1%), Sodium metabisulphite (0.1%) etc.

2. Preservatives: Chloroform (0.25%), Benzoic acid (0.1%) Methyl paraben, propyl paraben, etc.

3. Colouring Agents: E.g. Coal tar dyes.

4. Sweeteners: sodium saccharin, sucrose, syrups etc.

5. Flavouring Agents: The following flavouring agents are commonly used in mixtures.

a. Aromatic water

b. Syrup and Glycerol.

c. Spirit lemon to cover the taste of alkaline citrates.

d. Orange syrup and compound orange spirit.

e) Differentiate between "Flocculated and Deflocculated" suspension.(0.5 x 6 points = 03 marks)

Flocculated suspension	**Non flocculated suspension**
1) Particle form loose aggregates & form network 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)Sediment 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 is pleasing in appearance.

f) Describe any three tests used to identify the types of emulsion. (1 mark for each test)

1) Dilution Test -

- Emulsion diluted with water i)Emulsion remains stable then it is o/w emulsion
  ii)Emulsion break it is w/o emulsion
- Emulsion diluted with oil i)Emulsion remains stable then it is w/o emulsion
  ii)Emulsion break it is o/w emulsion

2) Dye Test-

- Emulsion diluted with scarlet red dye i)Dispersed globules appear red & background is colourless then it is o/w type ii) Dispersed globules appear colourless & back ground is red then it is w/o type.

3) Conductivity Test-

This type of emulsion show bulb glowing on passing electric current.

- If bulb glow the emulsion is o/w type
- If bulb does not glow the emulsion is w/o type

4) Fluorescence Test:

- If an emulsion on exposure to ultra-violet radiations shows continuous fluorescence under UV light, then it is w/o type
- If it shows only spotty fluorescence, then it is o/w type.

5) Cobalt Chloride Test:

- When a filter paper soaked in cobalt chloride solution is dipped in to an emulsion and dried, it turns from blue to pink, indicating that the emulsion is o/w type.

Q. 3 Attempt any FOUR of the following: 12

a) Find concentration of sodium chloride required to make 1.5% solution of cocaine hydrochloride iso-osmotic with blood plasma. (F.P.of 1%w/v solution of of cocaine hydrochloride = 0.09^0C & F.P.of 1%w/v solution of sodium chloride = 0.576^0C)
(0.5 M for formula, 2.0 M for calculation and 0.5M for unit)

Ans: Data Given:

F.P.of 1%w/v solution of cocaine hydrochloride = 0.09^0C

& F.P.of 1%w/v solution of sodium chloride = 0.576^0C

Formula:

Qty of sodium chloride required= 0.52-a/b

Where, a = F.P.of 1%w/v solution of unadjusted substance

And b = F.P.of 1%w/v solution of adjusting substance

= 0.52- (1.5 X 0.09)/0.576

= 0.385/0.576

= 0.668 % w/v

b) Identify incompatibility and write method of correction.

Rx

Caffine citrate -------1.0 g

Sodium salicylate --- 3.0 g

Water – upto -------- 90 ml

Make a mixture

Ans: In above formulation there is a chemical incompatibility due to the chemical interaction among the ingredients. (**1 marks)**

Caffeine citrate is a mixture of equal weight of caffeine and citric acid. The citric acid present in caffeine citrate react with sodium salicylate to liberate salicylic acid which gets precipitated. If caffeine is used instead of caffeine citrate it forms a soluble complex with sodium salicylate. Hence substitute caffeine citrate with half as much caffeine as that of caffeine citrate to form a clear mixture. **(2Marks)**

c) What is physical incompatibility? Explain the physical incompatibility which occurs due to immiscibility or liquification.

Physical incompatibility: (1M)

- When two or more substance mixed together, a physical change takes place and an undesirable product is formed.
- **Types of Physical Incompatibility:**
  - Immiscibility.
  - Insolubility.
  - Precipitation.
  - Liquefication.

Immiscibility: **(1M for description, 1M for example= 2M)**

Rx

Castor oil .....15 ml

Water ..... 60 ml

Make an emulsion

- Oil and water are immiscible with each other. they can be made miscible with water by emulsification.
- In this prescription castor oil is immiscible with water.
- To overcome this incompatibility an emulsifying agent is added.

Liquefication: (1M for description, 1M for example)

- When certain low melting point solids are mixed together they form a new chemical compound which has melting point lower than room temperature, therefore they become liquid at room temperature.
- These types of substance cause problem when they are dispensed in powder form. The substance can be dispensed by any one of the following methods;
  i. Triturate together to form liquid and mixed with an absorbent like light kaolin or light magnesium carbonate to produce free flowing powder.
  ii. The individual medicaments are powdered separately and mixed with absorbent and then combined together lightly and fitted in suitable container.

Rx

Menthol ..... 5 g
Camphor ..... 5 g
Ammonium Chloride ..... 30 g
Light Mg carbonate ..... 60 g

Prepare a powder

- In above prescription menthol, camphor and ammonium chloride gets liquefied on mixing with each other.
- To dispense this prescription, menthol, camphor and ammonium chloride are triturated together to form liquid.
- Add light magnesium carbonate and mix it thoroughly to make free flowing powder.

d) Differentiate between liniment and lotion. (0.5 X 6 = 3M)

Liniments	Lotions
1.They are used for counter irritant, rubefacient, soothing 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 are applied on broken skin.
5.Applied directly	5.Applied with cotton gauze
6.Turpentine liniment	6.Sulphur lotion

e) What is creaming? Discuss the various factors on which rate of cream depends.

Creaming : (1M)

- When large globules or aggregate of globules rises to the top of an emulsion or fall to the bottom and form concentrated thick layer.
- Temporary phase.
- Creaming should be avoided because it leads to cracking.
- Stock equation:

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

Where; V= rate of creaming

r = Radius of globules

d_1-d_2 = Difference between the Density of dispersed phase and continuous phase

μ = Viscosity

Factors (0.5 X4 = 2M)

1. **Radius of globules**: it is directly proportional to rate of creaming, change in the radius of globule leads to change the rate of creaming.
2. **Difference between the Density of dispersed phase and continuous phase:** it is directly proportional to rate of creaming, the change in the Density of dispersion medium/dispersing medium leads to change the rate of creaming.
3. **Viscosity**: it is inversely proportional to rate of creaming, if viscosity is increased rate of creaming decreases and if viscosity decreased rate of creaming increased.
4. **Storage condition**: during the storage there is temperature variations, if temperature is changed it affects the viscosity and it leads to change in the rate of creaming.

f) Write down different methods which are commonly used for evaluating physical stability of suspension. Explain any one of them.

Method of evaluation: (0.5 X 3 = 1.5M)

- Sedimentation Method:
- Rheological Method:
- Electrokinetic's Method:
- Micromeritic Method:

Any one method (1.5M)

- **Sedimentation Method:**

  • Sedimentation volume is the most important parameter in the evaluation of the stability of suspension

  • It is determined by keeping a measured volume of the suspension in a graduated cylinder in an undisturbed position for a definite period of time and noted the ultimate height (Hu) of the sediment and initial height of the total suspension.

  • The sedimentation volume F is the ratio of the ultimate height and initial height .(Hu/Ho) • The sedimentation volume plotted against time, the graph indicates the sedimentation pattern of suspension on storage.

- A stable suspension shows a horizontal or less steep curve.
- The evaluation of redispersibility can also be determined by shaking the suspension and again find out the sedimentation volume (Hu/Ho).

- **Rheological Method:**
  - The viscosity of the suspension is studied at different time intervals by using a good quality of viscometer.
  - It provide useful information regarding stability of suspension.
- **Electrokinetic's Method:**
  - The determination of surface electric charge or zeta potential is helpful to find out the stability of suspension.
  - Certain zeta potentials produce more stable suspensions because of controlled flocculation.
  - Zeta potential can be calculated from the migration velocity of the particles measured by the electrophoretic method.
- **Micromeritic Method:**
  - The stability of suspension depends on the particle size of the disperse phase.
  - The size of the particle in a suspension may grow and may ultimately leads to the formation of lumps or cracking.
  - So any change in the particle size with reference to time will provide useful information regarding the stability of a suspension.
  - A change in particle size distribution and crystal habit may be studied by microscopy and coulter counter method.

Q.4. Attempt any FOUR of the following: 12

a) Define shampoo. Describe formulation of shampoos.

Shampoos may be define as preparation containing surface active agents which are used to remove dirt grease and debris from the hair scalp and other part of body without affecting the natural gloss of hair **(1mark)**

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Various additives used in formulation of shampoos (2 mks)

1) **Conditioning Agent:-** used to lubricate the hair & improve the texture of hair & it reduces the fluffiness & make the hair soft & shiny.
   e.g. Linolin & its derivatives, Glycerine, PG, etc
2) **Thickening Agents:-** Use to increase the viscosity of shampoo & provide desired consistency.
   e.g. Polyvinyl alcohol, Methyl cellulose, Na Alginate, etc
3) **Solubilizig Agent :-** Used to solubilize poorly soluble subs.
   e.g. ethyl alcohol, glycerol, PG. etc
4) **Opacifying Agents:-** used to make shampoo opaque.
   e.g. glycerol, glyceryl stearate, stearyl alcohol. etc
5) **Preservatives:-** used to preserve the shampoo against bacteria or mould.
   e.g. Methyl Paraben, Propyl Paraben

b) What is poultice? How kaolin poultice is prepared. (Definition 1M, method of preparation 2M)

Poultice

Ans: Poultices are soft, viscous wet masses of solid substances applied to the skin for their fomentation action in order to provide relief from pain or reduce inflammation or to act as a counter-irritant. Poultices are also known as 'cataplasms'. Poultices were used to prepare in ancient times to drain infectious material from diseased tissues. Kaolin act as heat carrier

Poultices is applied to affected part after heating until heat is tolerated on the back of the hand.

Method of preparation of Kaolin Poultice BPC.

Rx,

Heavy Kaolin, dried at 1000C and finely sifted.

Boric acid, finely sifted

Thymol

Peppermint oil

Methyl salicylate

Glycerin

Make a poultice.

Direction: Spread the warm poultice on a dressing material and applied on the affected part.

Method of Preparation:

- Sieve kaolin & Boric acid through a sieve no. 180.
- Mix the Heavy kaolin & Boric acid with glycerin to form a smooth paste in a mortar.
- Transferred to a heat resistant glass jar protected suitable and heat at 120^0C for one hour in hot air oven with occasional stirring.
- Dissolve thymol in methyl salicylate and Peppermint oil.
- At this solution to cooled mixture and mix thoroughly.
- Transfer it to suitable container close it tightly and labels it.

c) Calculate the displacement value of ZnO in theobroma oil suppositories containing 40% of ZnO and is prepared in 1 gm mould. The weight of 08 suppositories is 11.74 gm.

Calculation: (3M)

1. Weight of 8 suppositories containing Theobroma oil = 1X 8 = 8 gm.
2. Weight of 8 suppositories containing 40% Zinc Oxide = 11.74 gm.
3. Amount of theobroma oil present in 8 suppositories = 60/100 X 11.74 = 7.044 gm.
4. Amount zinc oxide present in 8 suppositories = 40/100 X 11.74 = 4.696gm

5. Qty of theobroma oil displaced by Zinc oxide = 8 – 7.044 = 0.956 gm
6. Displacement value = Amount of drug/ qty of base displaced = 4.696/0.956 = 4.912 ≈ 5

d) Define the term sterility test. Discuss the different types of dialysis fluids which are used in process of dialysis.

Definition: (1M)

Method of testing performed to detect presence of viable microorganism fungi and yeast in the given preparation is called sterility test.

Types of dialysis fluid :(2 X 1 = 2M)

1. **Haemodialysis fluid.(0.5M)**
   - Haemodialysis is done to remove toxins from the blood.
   - The toxins from blood is removed by using haemodialysis fluid.
   - A kidney unit may require more than 1200 litres of solution in a week, so haemodialysis fluid is prepared in concentrated from which can be diluted with deionised water or distilled water before use.
   - **Composition of concentrated haemodialysis fluid B.P.C. (0.5M)**

     Dextrose Monohydrate …….8.0 g

     Sodium acetate ……. 19.04 g

     Lactic acid ……. 0.4 g

     Sodium chloride ……. 22.24 g

     Potassium chloride ……. 0.4 g

     Freshly boiled and cooled water to …….. 100 ml
2. **Intraperitoneal dialysis fluid: (0.5M)**
   - The peritoneal cavity is irrigated with the dialysis solution and peritoneum acts as the semipermeable membrane there by the toxic substance normally excreted by kidney are removed.
   - Intraperitoneal dialysis fluid should be sterile and free from pyrogen.

- **Composition of Intraperitoneal dialysis fluid I.P 85. (0.5M)**

  Sodium chloride ……. 5.56 g

  Sodium acetate ……. 4.76 g

  Calcium chloride ……. 0.22 g

  Magnesium chloride ……. 0.152 g

  Sodium metabisulphite ……0.15 g

  Dextrose …….. 17.0 g

  Purified water q.s to ……1000 ml

e) **Define the term ophthalmic products. Write the essential characteristics of different ophthalmic products.**

Definition: (1M)

Products which are used for insertion/application to the eye are called as ophthalmic products.

OR

They are sterile product meant for instillation into eye in the space between the eyelids and the eyeballs

Essential characteristics: (0.5 X 4 = 2M)

- It should be Sterile
- It should be Iso-osmotic
- It should have pH matching with lachrymal secretion.
- It should be Free from foreign particles.
- It should be stable.
- It should contain suitable preservative to prevent microbial growth.
- It should be viscous to prolong the contact time of drug in the eye.
- Suitable surface active agent has to be added.

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f) Define and differentiate between antiperspirants and deodorants.

Definitions: (1M)

Antiperspirants& Deodorants: Antiperspirants& Deodorants are cosmetic product, which are used to reduce sweat formation and body odour.

Difference: (0.5 X 4 = 2M)

Sr. No.	Antiperspirants	Deodorants
1	These are used to reduce the sweat formation	These are used to reduce body odour.
2	These inhibit the flow of perspiration	These inhibit formation of bad odour.
3	These are having astringent action	These are having antibacterial action
4	These contain salt of various metals, such as aluminium iron, chromium, lead, etc.	These do not contain metals.
5	Ex. Dove ultimate care, etc.	Ex. Fogg, etc

Q.5 Attempt any FOUR of the following: 12

a) What is Posology? Enlist different factors affecting dose of drug.

Definition (1 mark)

Posology is branch of medical science which deals with dose of drug which is administered to patient to get desired pharmacological action

FACTORS AFFECTING DOSE AND ACTION OF DRUG (0.5 X 4 =2 MARKS)

1)Weight

2)Age.

3) Sex

4) Route of administration

5)Pathological state

6)Time & frequency of drug administration.

7) Tolerance

8)Idiosyncracy

9)Simultaneous administration of two or more drugs- I) Addition ii) Synergism (iii) Antagonism

10) Tachyphylaxis

11) Allergy

b) Define pyrogens ?Describe procedure for pyrogen testing?

Pyrogens:-Pyrogens are the metabolic product of micro-organisms which increase body temperature. **(1 mark for definition and 2 mark for any one test)**

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 in 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.

OR

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

c) What is HLB. Give its significance.

HLB Definition (1 mark) and its significance (2 marks).

[HLB] – Griffin developed a system to assists making systematic decisions about the amounts and types of surfactants needed in stable emulsion. The system is called the HLB System (hydrophillic – Lipophilic Balance)

System and has an arbitrary scale of 1-18 HLB numbers are experimentally determined for different emulsifiers in laboratory.

An emulsifier having a low HLB number indicates that the number of hydrophilic groups present in the molecule is less and it has a lipophillic character. For eg. spans generally have low HLB number & they are oil soluble. Because of their oil soluble character, they favours w/o emulsion.

A higher HLB number indicated that the emulsion has a large number of hydrophilic group & hence it is hydrophilic in character. Therefore it favours o/w emulsion.

HLB Range	Application
4-6	w/o emulsifying Agents
8-18	o/w Emulsifying agents

d) Calculate The quantity of dextrose required to prepare 8 floz of 5% solution. (3 marks)

Solution: 35 grs in 8 floz is 1% solution.

Therefore 35 x 5 grs in 8 floz is 5% solution.

175 grs in 8 floz is 5% solution.

Therefor dissolve 175 grs dextrose in 8 floz solution to get 5% solution.

e) Define Powders. Give advantages and Disadvantages of powders.

D**efine Powders. (1 mark) Give advantages.(0.5 X 2= 1 mark) and Disadvantages .(0.5 x 2 = 1 mark)**

Powders are mixtures of finely divided solid and or excipients in their dry form used internally and externally

ADVANTAGES

- Faster dispersal of medicament compared to tablet,capsules
- Convenient for dispersing bulky drug.
- Dry therefore stable,
- Less incompatible ,
- Rapid onset of action.
- Convenient for children & elderly patients.
- Economical.
- Easy to carry than liquid dosage form.
- Large quantity can be easily administered by patient orally.

DISADVANTAGES

- Drugs having bitter, nauseous, unpleasant taste cannot be dispensed in powder form.
- Deliquescent & Hygroscopic drug cannot be given in powder form.
- Drugs affected by atmp. Condition cannot be given in powder form.
- Dispensing is time consuming
- Weighing difficulty (qty. Less than 100mg.)

f)how will you dispense the following prescription.

Rx

Hyoscine Hydrobromide 1/150 grains

Send 12 powders

Solution(3 MARKS)

Calculate for 15 powders

Hyoscine Hydrobromide 15 x 1/150 grains =1/10 grains.

Note: Take 1 grain of hyoscine Hydrobromide and triturate with 9 grains of lactose.

1 grain of above mixture will contain 1/10 grains of Hyoscine Hydrobromide.

Method:

1 grain of above mixture+29 grains of lacose be triturated. So total mass 30 grains.Divide this into 15 powders each weighing 2 grains.(Each powder should weigh 2 grains).

Or

Note: Take 2 grain of hyoscine Hydrobromide and triturate with 18 grains of lactose.

2 grain of above mixture will contain 1/10 grains of Hyoscine Hydrobromide.

Method:

2 grain of above mixture+28 grains of lacose be triturated. So total mass 30 grains.Divide this into 15 powders each weighing 2 grains.(Each powder should weigh 2 grains).

Q.6 Attempt any FOUR of the following **16**

a) Define "prescription" .describe in brief, the various parts of prescription.

Definition :(1 Mark)

Prescription is a written order from a registered medical practitioners, such as dentist, veterinarian etc. to a pharmacist to compound & dispense a specific medications for the patient.

Parts of prescription: (0.5 X 6 = 3M)

1. **Date**: It is important to avoid misuse of prescription if it is presented by the patient, a number of time for dispensing.
2. **Name, age, sex & address of the patient :** The Name, age, sex & address of the 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.
3. **Superscription:** It consist of symbol Rx which is instruction to pharmacist. Rx stands for Latin word recipe meaning ' you take'. This is for praying quick recovery of patient.

4. **Inscription:** This is main part of prescription order & contains name & quantities of the prescribed ingredients.
5. **Subscription:** It contain direction to the pharmacist for preparing prescription which is usually 'Mix',' Send tablets', or 'capsules' etc.
6. **Signature :** It consist of the direction to be given to the patient regarding administration of the drug.
7. **Renewal instructions :** The prescriber indicate on every prescription order whether it may be renewed & if so, how many times. It is important particularly in the prescription containing the narcotic & other habit forming drugs to prevent misuse.
8. **Signature, address & registration number of the prescriber:** The prescription bears signature, address & registration number of the prescriber. It is important particularly in the prescription containing the narcotic & other habit forming drugs to prevent misuse.

b) **What are mixtures? Classify different types of mixtures. Discuss in brief, the various vehicles and adjuvants used in formulation of mixtures.**

Definition (0.5 mark), Classification: (0.5 X 3 = 1.5 marks)

Definition: A **mixture is** a soln. or concentrates of soluble or insoluble solids or liquids in a vehicle for internal use.

Or

Mixture is a liquid dosage form containing medicament or medicaments in their dissolved, disperse and suspended in the given vehicle.

MIXTURES CAN BE CLASSIFIED AS FOLLOWS

Class 1:Mixtures containing soluble substances only:

Iron & ammonium citrate mixture

Class 2:Mixtures containing diffusible solids

eg. Magnesium carbonate mixture:

Class 3:Mixtures containing indiffusible solids

eg. antidiarrhoeal mixture with prepared chalk.

Class 4:Mixtures containing ppt. forming liquids:

eg.Ammoniated solution of quinine.

Class 5:Mixtures containing slightly soluble liquids:

Eg. Paraldehyde mixture.

Formulation of Mixture:

a. **Vehicles**: following vehicles are used**.(0.5M)**
    1. Water: purified water
    2. Aromatic water: Multiple use, e.g. chloroform water, Cinnamon water, etc.
    3. Medicated vehicle: Infusions, ex. Senegal infusion as expectorant.

b. Adjuncts: Adjuncts are generally used to improve the Safety, efficacy and palatability. **(0.5 X 3 = 1.5M)**
    1. Chemical Stabilizers: e.g. Antioxidant: Ascorbic acid (0.1%), Sodium metabisulphite (0.1%) etc.
    2. Preservatives: Chloroform (0.25%), Benzoic acid (0.1%) Methyl paraben, propyl paraben, etc.
    3. Coloring Agents: E.g. Coal tar dyes.
    4. Sweeteners: sodium saccharin, sucrose, syrups etc.
    5. Flavoring Agents: The following flavoring agents are commonly used in mixtures.
        a. Aromatic water
        b. Syrup and Glycerol.
        c. Spirit lemon to cover the taste of alkaline citrates.
        d. Orange syrup and compound orange spirit.

C) Define the term' Emulsifying agents.' Write the qualities of an ideal emulsifying agents. How will you classify Emulsifying agents?

Definition (1/2 mark), Ideal properties (1 mark) classification of Emulsifying agents: (2 marks)

The emulsifying agent are defined as agent reduce the interfacial tension between two phases i.e. oily & aq. phase& thus make them miscible with each other. & form a stable emulsion.

Ideal prpoperties:

1) It should be capable of reducing the interfacial tension between the two immiscible liquids.

2) It should be compatible with other ingredients of the preparation.

3) It should be non toxic

4) It should be capable to produce and maintain the required consistency of the emulsion.

5) It should be chemically stable.

6) It should be capable of keeping the globules of dispersion liquid distributed indefinitely throughout the dispersion medium

Classification of Emulsifying Agent:

Emulsifying Agents can be divides as follows:

1. Natural:
    a. Vegetable source: eg. Gum acacia, Tragacanth, agar, pectin, starch, irismoss (chondrus)
    b. Animal Source: wool fat, egg yolk, gelatin.
2. Semi-Synthetic; Methyl cellulose, Sodium carboxy methyl cellulose
3. Synthetic:
    a. Anionic: sodium luryl sulphate,
    b. Cationic: cetrimide, Benzalkonium chloride, etc.
    c. Non ionic: glyceryl esters etc.
4. Inorganic: Milk of magnesia, magnesium oxide ,Magnesium trisilicate, Magnesium aluminum silicate, Bentonite
5. Alcoholes Carbowaxes Lecithins Cholesterols

WINTER-15 EXAMINATION

d)Define protectant, keratolytic, parasiticide and antiprutic ointment.

Each definition 1 mark

1)**Protectants**: These ointments protect the skin from moisture ,air ,sun rays or other substances such as soaps or chemicals.eg of drugs calamine ,zinc oxide ,silicones ,titanium dioxide.

2)**Keratolytics**: These ointments used to remove or soften the horny layer of the skin.

Eg .resorcinol, salicylic acid and sulphur

3) **Parasticide ointment**: These ointments are used to destroy or inhibit living infestation, such as lice & ticks. Eg.benzyl benzoate, hexachloride , sulphur.

4)**Antipruritic** :These ointments are used to relieve itching. Eg. Benzocain & coal tar.

e) what are "eye lotion" or 'contact lens solution"? describe in brief the formulation of eye lotion or contact lens solution which are commonly used.

(For Definition 1 mark and formulation 3 marks)

Eye lotions;-These are the sterile aqueous solutions used for washing of the eyes are supplied in concentrated form and are required to be diluted with warm water immediately before use.

Formulation of Eye lotions:

1).Preservative-To prevent bacterial or fungal growth, following bactericide may be used to preserve the eye-lotions:—

(i) Phenyl mercuric nitrate/acetate 0.002%

(ii) Benzalkonium chloride 0.01%

(iii) Chlorohexidine acetate 0.01%

2) **Buffers** : are added to adjust and maintain the pH of the eye lotions

Eg.Boric acid ,sodium acid phosphate, sodium citrate

3)**Anti oxidants** are added to prevent oxidation.

Eg Sodium Metabisulphite (0.05-0.5%), sodium thiosulphate (0.1-0.2%)

4)**Isotocity adjustment subatances**: Eye lotions are iso-osmotic with tears because they cause much greater dilution of the lachrymal fluid and, hence, are more likely to cause discomfort if not adjusted.0.9% sodium chloride solution.

Or

Contact lens solutions

For Hard contact lenses two solutions are there,

1) **Wetting solution** is use for treating the lenses before insertions since these are poorly wetted by lachrymal secretions. Hence the contact lenses require moistening with a wetting agent to make the insertion easy and comfortable.

The formulation of contact lens solutions contains a wetting agent. Thickening agent (cellulose derivative), antimicrobial agent (benzalkonium chloride) ,Isotonicity adjustments (sodium chloride).

2) **Storage solutions**: It is used for overnight cleansing, soaking and storage. They are stored in storage solution to prevent dehydration.

The formulation of storage solutions contains non-ionic surfactant which helps in cleansing the contact lenses.it also contains preservative to prevent microbial growth.

For soft contact lenses are cleansed by heating in 0.9% sodium chloride solution.The wetting of soft contact lenses is not problem because of the hydrophilic nature of the lenses.The storage solution should be sterile.

f) How will you dispense following prescription

Boric acid ……10 gr

Coca Butter …….....q.s.

Preapare 5 pessaries.

Capacity of mould is 120 grains

Problem Solution – (4 marks)

Calculate for 6 pessaries.

Weight of Cocoa butter for 6 pessaries. = 720 grains

Weight of Boric acid for 6 pessaries. = 60 grains

Displacement Value of Boric acid = 1.5

The quantity of Cocoa butter required = Total amount of base – Total amount of drug / Displacement Value

= 720 – 60/ 1.5

= 720- 40 = 680 grains

Formula for 6 Suppositories is

Boric acid	60 grains
Cocoa butter	680 grains

Or

Calculate for 6 pessaries.

Weight of Cocoa butter for 6 pessaries. = 120 X 65X6 = 46.8 g

Weight of Boric acid for 6 pessaries. = 60 x 65 = 3.9g

Displacement Value of Boric acid = 1.5

The quantity of Cocoa butter required = Total amount of base – Total amount of drug / Displacement Value

= 46.8 – 3.9/ 1.5

= 46.8- 2.6 = 44.2g

Formula for 6 Suppositories is

Boric acid	3.9 g
Cocoa butter	44.2 g