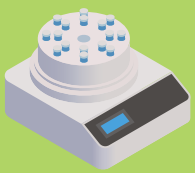
NEW EDITION

D Pharmacy 1st Year

0805 PHARMACEUTICS - I

Important Questions



MOCK TESTBOOK

AUTHOR OF BOOK

1) Name various types of closures. (Summer-2015, 16)

Answer: Closures are devices by means of which containers can be opened and closed.

TYPES OF CLOSURES WITH EXAMPLES:

1. Plug type – It is a push-fit into the neck of the container. E.g. cork or glass stopper. Nowadays plastic stoppers being flexible and unbreakable are used to ensure a good fit into the container.

2. Crown cap – The cap is commonly used as crimped closure for beverage bottles. E.g.Cap of glass beverage bottles.

3. Push-fit cap – These are simple slide fits over the neck of the container. These are made of plastic and are shaped in such a way that these must be stretched over the neck to fit on the container. It provides a tight fit.

4. Screw closures – It consists of three components –

i) Cap: It is made of tin plate of aluminum. The container is simply closed by screwing the cap on the container.

Ii) Wad: it is a seal which prevents contamination of the product. Made of rubber or silicone rubber, however cork or cardboard wads are also used.

Iii) Liner: It is made of metal foils, rubber, plastic films, and paper impregnated with a suitable resin, wax or plastic.

2) Define drug and dosage forms. (Summer-2015, 19)

Answer: (i) Drug- A chemical agent intended for use in the diagnosis, mitigation, treatment, cure or prevention of disease in man or in other animals.

(ii) Dosage forms- Dosage form is a transformation of a pure chemical compound into a predetermined form by admixing drug components with non- drug components.

3) What are the various factors which affect the size reduction of the drugs? (Summer & winter 2015-2019)

Answer: Factors affecting Size Reduction:

i. Hardness: Soft material is easier to break than hard.

ii. Toughness: Drugs with fibrous nature or those having high moisture content are tough and hard to reduce in size.

iii. Stickiness: Material adheres to the grinding surface or sieve surface of the mill. It is very difficult to powder a drug that has gummy or resinous material.

iv. Material structure: Material with some special structure cause problem during size reduction e.g. Vegetable drugs with cellular structure produce long fibrous particles on size reduction, similarly a mineral substance having lines of weakness, produce flake like particles on its size reduction.

v. Moisture content: The presence of moisture in the material influences a number of its properties such as hardness, toughness or stickiness.The material having 5% moisture in case of dry grinding and 50% in case of wet grinding is permissible.

vi. Temperature: Waxy material such as stearic acid or drug containing oils or fat, become softened during the size reduction, due to heat. This can be avoided by cooling the mill.

4) Write any four applications of simple distillation. (Summer-2015, Winter 2017)

Answer: Following are the different types of distillation:

1) Simple distillation
2) Distillation under reduced pressure
3) Fractional distillation
4) Steam distillation
5) Destructive distillation

5) Write the type of mixing. (Summer-2015, 16)

Answer: Positive Mixing: In Positive mixing ,two or more than two miscible liquids are mixed or soluble solids are dissolved in water, This mixture does not represent any problem in mixing. Mixture formed is irreversible.

Negative Mixing: In negative mixing,two immiscible liquids are mixed or insoluble solids are mixed with water to form negative mixtures. For preparing such a type of mixing a higher degree of mixing of materials is required. The mixture formed is a reversible mixture.

Neutral Mixing: In Neutral mixing, substances do not have the tendency to mix with each other immediately, but once mixed they do not separate after mixing. These mixtures are static in their behavior

6) Write any four properties of an ideal container. (Summer-2015, 17)

Answer: Container is a device that holds the drug and it may or may not be in direct contact with the pharmaceutical preparations.

The container should be:

i. Neutral

ii. No interaction.

iii. Stability against environmental factors.

iv. Withstand wear and tear during handling.

v. Easy to remove dose.

vi. Withstand changes in pressure and temperature.

vii. Labeled easily

viii. Non-toxic.

ix. Closure is easily removable/replaceable.

7) Define pharmacopeia. (Summer-2015, 16, 17, 18 and winter 2017)

Answer: Pharmacopeia: Pharmakon means “a drug” and poein means “to make”. Pharmacopeia is defined as a compressive book which is issued under the authority of government and contains a list of drug and formulae used for medicinal preparation with description and the tests for those substances and the standards to which they must confirm.

8) Formaldehyde is not used in gaseous sterilization. Why ? (Summer-2015 & Winter 2018)

Answer: Formaldehyde is not used in gaseous sterilization. Because of its

i. Weak penetration power.

ii. Difficult to maintain high conc.

iii. Require high humidity for effectiveness.

iv. Readily inactivated.

v. Irritant to respiratory tract.

vi. Difficult to remove adsorbed gas.

1) Write the difference between hard and soft gelatin cap (Summer-2015, Winter 2019)

Hard gelatin capsules	Soft gelatin capsules
The hard gelatin capsule shell consists of two parts: Body and cap	The soft gelatin capsule shell becomes a single unit
They are cylindrical in shape.	They are available in round, oval and tube-like shapes
The contents usually consist of medicaments in the form of powder, beads or granules.	The contents usually consist of liquids or semisolids
These are prepared from gelatin, titanium dioxide, coloring agent and plasticizer	These are prepared from gelatin, more plasticizer (sorbitol or glycerin) and preservatives.
Filling and sealing takes place in different steps	Filling and sealing are done in a combined operation of machines
Shell is perfectly dry	Shell is not perfectly dry
Eg. Becosules capsules	Eg. Pudin Hara

2) Mention advantages and disadvantages of plastic containers (Summer-2015, Winter 2019)

Answer:

Advantages:

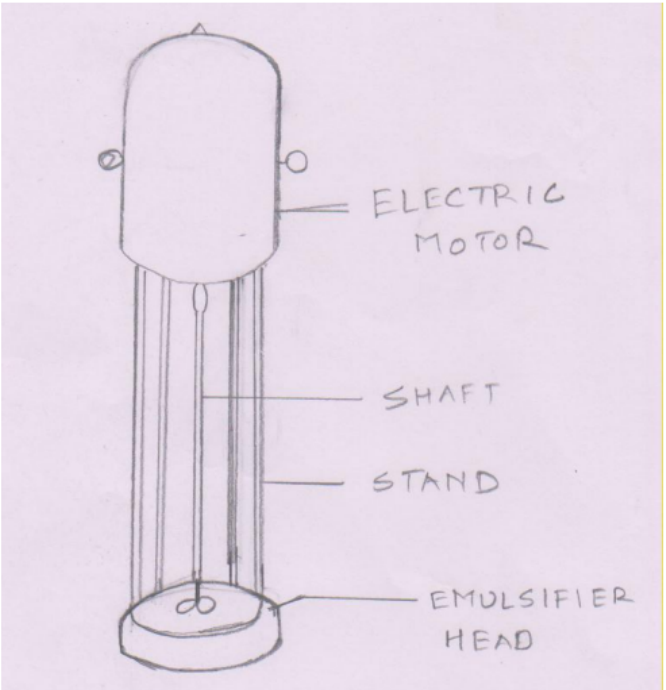
1. Light in weight and can be handled easily.
2. Poor conductor of heat.
3. Sufficient mechanical strength.
4. Transported easily.
5. Unbreakable.
6. Available in various shapes and sizes.
7. Good protection power.
8. No formation of flakes.

Disadvantages:

1. Permeable to water vapor and atmospheric gasses.
2. Cannot withstand heat without softening or distortion.
3. May interact with certain chemicals to cause softening or distortion.
4. May absorb chemicals such as preservatives.
5. Relatively expensive.
6. Special type of gum or adhesive required for labeling

3) Draw a neat diagram of silverson mixer (Summer-2015, 16)

Answer:



4) Write in detail about the modified percolation process. (Summer-2016, 18)

Answer: Modified Percolation: In percolation process for tinctures drug\ percolate (d/p) ratio is 1:4.The drug/percolate ratio is reduced to 1:3 by modifying percolation process. Thus saves a lot of heat, time and menstruum.

It is proved that the menstruum remaining in contact with the drug dissolves more active constituents than the flowing menstruum. Hence simple percolation process requires more menstruum to exhaust the drug. But if continuous percolation stage has suitable breaks by short maceration stages, the d/p ratio can be reduced to 1:3

e.g .In Simple Percolation process:

Drug→ Imbibition → Maceration → Percolation collect the Percolate, i.e.3/4th of the volume of finished product.

(200gm) **(4hrs.)** **(for 24 hrs.)**

In modified percolation process:

Drug → Imbibition → Maceration → Percolation- collect 1000ml of percolate

(1000gm) **(for 24 hrs.)**

→ Maceration → Percolation- collect 1000ml of percolate

(for 12 hrs.)

→ Maceration → Percolation- collect 1000ml of Percolate

(for 12 hrs.)

- Drug : Percolate
  1000gm : 3000ml
  d/p = 1:3

After exhaustion of the drug, the percolate is evaporated and then mixed with main percolate.

Final volume is made by adding more menstrum.

5) Define Aerosols. Classify aerosol. Give the formula of an aerosol with an example. (Summer-2015, 16)

Definition: Aerosol

Aerosols may be defined as a dispersed phase system in which very fine solid particles or liquid droplets get dispersed in the gases which act as a continuous phase. These are also called pressurized dosage forms.

Classification of aerosol

a. Space SpraysThese are finally divided spray having particle size up to 50 e.g. Insecticides, disinfectant.

b. Surface coat's – These are also spray but disperse particle are coarse with size up to 200 They produce a wet coat when sprayed on a surface e.g. Hair sprays, personal deodorant powder spray's

c. Foam – These are produced by rapid expansion of propellant through an emulsion. Hence, the product comes out in the form of foam or front. E.g. Shaving cream & Vaginal product

Aerosol system may be of two types

1.Two phase system : Two phase system is employed in cases where the product is a solid insoluble in the propellant or it is solid or liquid which is dissolved in it. In the first case solid is suspended in the propellant, so that the aerosol system will have one liquid phase and gaseous phase is above it.

2.Three phase system : Three phase system is employed in cases where the product is immiscible with the propellant. The medicaments are dissolved in a liquid which does not mix with the liquefied propellant

Formula of aerosol:

Aerosol formulations basically consist of propellant & the medicament to be propelled. • Propellant

1) It develops a pressure in the container.

2) Compressed gases such as carbon dioxide or nitrogen & liquefied like methane or ethane used as propellant.

3) Compressed gases are not commonly used.

4) The medicament to be propelled may be solid or liquid.

5) It may be soluble in the propulsion or insoluble.

6) The various additives such as solvent , antioxidant surface active agent, flavoring agent are also included in the formulation.

7) The propellant, medicament, additives are filled into an aerosol container.

1) Explain factors which affect the rate of filtration by Darcy's law. (Summer-2015, 16, 17 Winter 2019)

Answer: This is also called the theory of filtration which gives ideas about factors affecting rate of filtration through the filter medium. Any fluid while passing through porous medium offers resistance, the rate of filtration through the filter media is expressed in the form of an equation which is known as Darcy's law The equation is, $V = KA \Delta P / \mu l$ Where , V = Volume of filtrate K = permeability coefficient & is dependent on filter medium & filter cake. A = Area of filter bed. ΔP = Pressure drop across filter medium & filter cake. l = Thickness of filter cake μ = Viscosity of filtrate
Thus, According to Darcy's law, different factors which affect the rate of filtration are:

2) What is a simple maceration process? (Summer-2015, 17)

Answer:

a) Drug along with whole menstruum is used in maceration process

b) The period of maceration is 7 days

c) Strain off the liquid and press the marc

d) Mix the pressed liquid with the macerate and clarify by subsidence or filtration.

e) Final volume is not adjusted

f) Examples of tincture made by this process are:

a. Tincture of Orange

b. Tincture of Lemon

c. Tincture of Capsicum

3) Classify different dosage forms with examples. (Summer-2016, 17)

Answer: Definition: Capsules are a solid unit dosage form in which the drug substances are enclosed in a water soluble shell or an envelope

Advantages of capsules: 1. Drugs having unpleasant odor and taste can be administered by enclosing them in a shell. 2. They are smooth, become slippery when moist and can be easily swallowed. 3. Economical.

4. Easy to handle and carry. 5. Capsules are made from gelatin and hence they are therapeutically inert. 6. Attractive. 7. Microencapsulation provides sustained release dosage form.

Disadvantages: 1. Hygroscopic drugs cannot be filled in capsule as they make the shell very brittle. 2. Concentrated preparation which needs dilution before administration cannot be given in form of capsule

4) Define and classify different types of tablets (Winter 2019)

Answer: Definition -Tablets are solid unit dosage forms containing medicament or medicaments usually circular flat or biconvex. OR Tablet is a solid unit dosage form prepared by compression.

Classification of tablets:
1. Tablets ingested orally: a)compressed tablet b)multiple compressed tablets c) multi-layered tablets d)sustained release tablets d)enteric coated tablets e)sugar coated tablets f)film coated tablets g)chewable tablets
2. Tablet used in oral cavity: a) Buccal tablets b) Sublingual tablets c) Lozenge tablets and teaches d) Dental cones

3. Tablets administered by other routes: a) Implantation tablets b) Vaginal tablets
4. Tablets used to prepare solutions a) Effervescence tablets b) Dispensing tablets c) Hypodermic tablets d) Tablet triturates

1) Define Drugs. Classify different types of dosage forms with examples (Summer-2016, Winter 2018, 19)

Answer: Drug- A chemical agent intended for use in the diagnosis, mitigation, treatment, cure or prevention of disease in man or in other animals

2) Classify the different methods of sterilization. (Summer-2018, Winter 19)

Answer:
A. Physical Method:

1. Dry heat sterilization.
2. Moist heat sterilization.
3. Radiation sterilization.

B. Chemical method:

1. Sterilization by heating with bacteria.
2. Gaseous sterilization.

C. Mechanical Method:

1. Ceramic filter.
2. Seitz filter.
3. Sintered glass filter.
4. Membrane filter

3) Explain various grades of powders. (Summer-2017, 18, 19 & WINTER 2019)

Answer: i. Coarse powder: A powder of which all particles pass through sieve no 10 with nominal aperture size 1.7mm and not more than 40% pass through sieve no 44 with nominal aperture size 355um.

ii. Moderately Coarse powder: A powder of which all particles pass through sieve no 22 with nominal aperture size 710um and not more than 40% pass through sieve no 60 with nominal aperture size 250um.

iii. Moderately fine powder: A powder of which all particles pass through sieve no 44 with nominal aperture size 355um and not more than 40% pass through sieve no 85 with nominal aperture size 180um.

iv. Fine powder: A powder of which all particles pass through sieve no 85 with nominal aperture size 180 um.

v.Very fine powder: A powder of which all particles pass through sieve no 120 with nominal aperture size 125 um.

Vi. Microfine powder: A powder of which not less than 90%by weight of particles pass through a sieve with nominal mesh aperture size of 45 um

vii. Superfine powder: A powder of which not less than 90%by weight of particles are less than 10 μm in size.

1) How is the BCG vaccine prepared by the freeze drying method? (Summer-2015, 17, 19)

Answer: Method of preparation of BCG vaccine: It is freeze- dried preparation containing live culture of the bacillus Calmette and Guerin strain of Mycobacterium tuberculosis. Preparation: The bacilli are grown on a suitable culture media until 1 mg when plated out on a suitable solid culture media shows not less than 20 million colonies. The growth period should not be more than 14 days in any case. After a suitable growth, they are separated by filtration in the form of a cake. The cake is homogenized in a grinding flask and suspended in a suitable sterile liquid medium designed to preserve the antigenicity and viability of the vaccine. The suspension is transferred into the final sterile containers and freeze-dried. Then containers are sealed so as to prevent contamination or deterioration of the vaccine. The vaccine contains no antimicrobial agent.

Dose: Prophylactic, 0.1 ml as a single dose by intracutaneous injection.
Storage: Store in hermetically sealed light resistant glass containers at a temperature between 20 C and 80 C. The reconstituted vaccine should be used immediately after its preparation. Uses: Immunizing agent which provides protection against tuberculosis.

2) What are the different types of vaccines? Write the method of preparation of the smallpox vaccine. (Summer-2016, 18

Answer: There are 4 main types of vaccines: Live-attenuated vaccines Inactivated vaccines Subunit, recombinant, polysaccharide, and conjugate vaccines Toxoid vaccines Smallpox vaccine is prepared by two methods
1) By using animals
2) By using Eggs By using Animals : it is done in following steps Selection of Animals: Healthy Sheep or calves selected and kept in an isolated area for 10-14 days under observation, it should be free from diseases

↓

Preparation of animals for scarification (Abdomen and flanks are scrubbed, washed and disinfected).

↓

Inoculation

(Light incisions are made on clear skin by scarifier, seed vaccine is inoculated in that area)

↓

Incubation

(Incubate for 7-9 days, kept clean and aseptic, pustules are formed on line of Scarification).

↓

Collection of viruses (Abdomen and flanks are washed with sterile water. The Pustules are withdrawn aseptically)

↓

Purification(mixed with equal volume of glycerin, cool and finely ground and store at - 10°C

↓

Filling and sealing (filled in final container and sealed aseptically) By using eggs: Hen egg is used (Which is incubated after 12 days)

↓

Small cut on the shell (exposed chorio-allantoic membrane)

↓

In this membrane, viruses are inoculated (by seed of known potency)

↓

Cut was sealed by flap or paraffin wax

↓

Again incubate for 72 hours

↓

Using aseptic condition, shell is removed and chorio-allantoic membrane is separated

↓

Contents are added in normal saline solution at 0° C

↓

Add 50 % glycerin

↓

Material is ground to produce homogenized suspension.

↓

Transfer to suitable sterile container and freeze dried

3) Define Pharmacopoeia. Discuss history of Indian Pharmacopoeia. (Summer–2018, Winter 2019)

Answer: Pharmacopoeia: Pharmakon means “a drug” and poein means “to make”. Pharmacopoeia is defined as a compressive book which is issued under the authority of government and contains a list of drug and formulae used for medicinal preparation with description and the tests for those substances and the standards to which they must confirm. History of Indian Pharmacopeia: The government of India directed the Drugs Technical Advisory Board to list the drugs that are used in India,

which are not mentioned in British Pharmacopoeia and also recommend the standards to be prescribed to maintain uniformity and the chemical tests to be used to establish identity and purity. The Government of India published the Indian Pharmacopoeial List in 1946 as a supplement to British Pharmacopoeia. The term list in the title was ‘misleading’ in that the book not only contained a list of drugs which were of substantial medicinal value but also laid down standards. The Indian Pharmacopoeial List contained about 180 monographs and a number of appendices prepared on the lines of the British Pharmacopoeia. Approximately 100 monographs were on vegetable drugs growing in India and on their galenicals. `The drugs of plant origin such as artemisia, bael, berberis, cannabis, ispaghula, kaladana, kurchi, myrobalan,picrorhiza, punarnava, rauwolfia, vasaka etc.were included in it. Similarly several oils such as ajowan,cassia, chaulmoogra, neem and pudina were included. The appendices gave detail for a number of determinations referred to in the monographs. The Pharmaceuticals and Drugs Research Committee of the Council of Scientific and Industrial Research decided in February 1947 to compile a ’Brochure’ to highlight the information and clinical users of the important indigenous drugs of India. Later on it was decided to prepare a ’Codex’ instead of Brochure on the lines of the British Pharmaceutical Codex.

The first Indian Pharmaceutical Codex was published in 1953.The Codex consisted of two parts. The part carried about 190 general monographs on natural products and drugs of vegetable and animal origin, and a few chemicals. The second part consisted of formulary of galenicals and other preparations. After the publications of the Indian Pharmacopoeial List the Government of India, constituted an eleven member Indian Pharmacopoeia Committee in 1948, in their notification No. F.1-1/48-DS dated 23rd November, 1948, for preparing the Pharmacopoeia of India. The tenure of the office of the members of the Committee was five years. It was extended by one year via Government notification no F.6-10/53- Dated 21st November 1953. In compiling the monographs of the first Pharmacopoeia of India, help was taken from all available established scientific data in the modern Pharmacopoeia, such as British Pharmacopoeia, the United States Pharmacopoeia, and the international Pharmacopoeia and from scientific institutions interested in drugs and Pharmaceuticals products. The first edition of Pharmacopoeia of India was compiled and then published in 1955. The second edition of Pharmacopoeia of India was compiled and then published in 1966. The third edition of Pharmacopoeia of India was compiled and then published in 1985. The fourth edition of Pharmacopoeia of India was compiled and then published in 1996.

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4) Explain the construction and working of Silverson mixer homogenizer (Summer-2017, Winter 2018)

Answer: Silverson Mixer Homogenizer Construction:
1) It consists of an emulsified head which is covered with fine meshed stainless steel sieves.

2) Emulsifier head consists of a number of blades which rotate at very high speed to produce powerful sharing action.

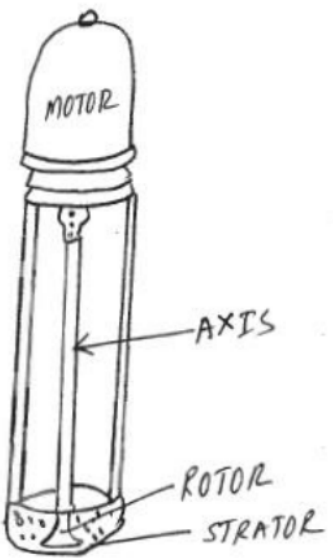
3) Blades are rotated by using an electric motor fitted at the top.

Working: 1) Emulsifier head is placed in the vessel containing immiscible liquid in such a way that it should get dipped into it.

2) When the motor is started liquid is sucked through fine holes and oil is reduced into fine globules due to the rotation of blades.

3) So fine emulsion is produced which is then expelled out.

Use: Useful for the preparation of fine emulsion and suspension.



SILVERSON MIXER HOMOGENISER.

Different methods of Sterilization :

I. Physical methods

1. Dry heat sterilization
2. Moist heat sterilization
3. Radiation sterilization

i) Use of U.V rays

ii) Ionizing radiation

II. Chemical methods

1. Sterilization by heating with bactericide
2. Gaseous sterilization

III. Mechanical methods

1. Ceramic filters
2. Seitz filters
3. Sintered glass filters
4. Sintered metal filters
5. Membrane filters

2) Write construction and working of cyclone separation (Summer-2016, 17 , Winter 2018)

Answer: Principle: Centrifugal force

Construction-

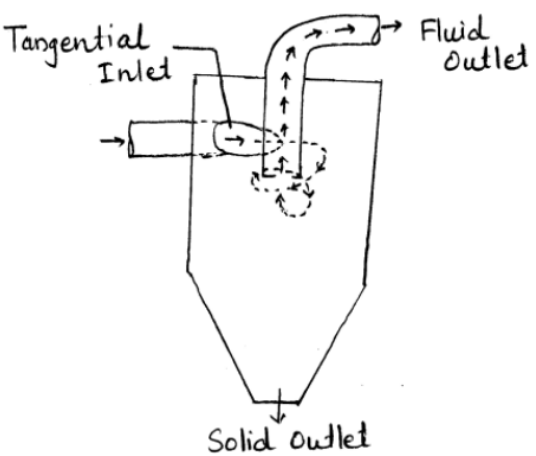
1) Cyclone separator is a size separation device

2) It consists of a cylindrical vessel with a conical base.

3) The upper part of the vessel is fitted with a tangential inlet and a fluid outlet.
4) At the base it is fitted with solid outlet

Working:
The suspension of a solid gas (Usually air) is introduced tangentially at a very high velocity so that rotary movement takes place within the vessel. The fluid is removed from a central outlet at the top. The rotator flow within the cyclone separator causes the practices to be acted on by centrifugal force. The solid is thrown out to the walls. Thereafter it falls to the conical base and discharges through the solid outlet.

Uses of cyclone separator:
1. Cyclone separator is used to separate the suspension of a solid in gas
2. It can be used with liquid suspension of solid



Cyclone Separator

2) When the motor is started liquid is sucked through fine holes and oil is reduced into fine globules due to the rotation of blades.

3) So fine emulsion is produced which is then expelled out.

Use: Useful for the preparation of fine emulsion and suspension.

3) What are aseptic techniques? What are various sources of Contamination? (Summer-2016, 19)

Answer: Aseptic technique: The method which is used to prevent the access of microorganisms during the preparation of parenteral products and their testing are called “Aseptic Technique”. Sources of contamination:
1) Atmosphere, which is contaminated with dust, droplets and droplet nuclei, becomes the breeding ground of microorganisms.
2) The hands are a major means of transmitting infection.
3) Coughing, sneezing and spitting can cause contamination considerable distance.
4) The clothes which absorb dust particles are also a source of contamination. A handkerchief is the richest source of contamination.

5) The hair.
6) Unsterile equipment.
7) Working surface

Test for Sterility:

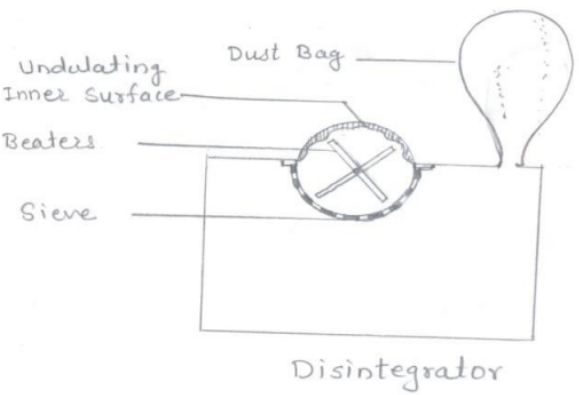
Principle: These tests are based on the principle that if bacteria or fungi are placed in medium provided favourable conditions like nutritive material, moisture temperature, the organism will grow and their presence can be indicated by the turbidity in clear solution. These test should be carried out in strictly aseptic condition. Method of testing : Test of sterility may be carried out by 1) Membrane filtration method 2) Direct inoculation method 1) Direct inoculation method: The substance to be tested is aseptically drawn from the container by a suitable device and transferred to the final culture medium in the test tube. The inoculated medium (test tubes) are incubated at 20-25°C for fungi and 30-37°C for bacteria for the period of seven days. Observe the growth of micro-organism in the medium. 2) Membrane filtration method : This method is preferred in the following casesAn oil or oily preparations, ointment, A non-bacteriostatic solid, soluble powder or a liquid that possesses bacteriostatic and fungistatic properties, liquid products where volume in a container is 100 ml or more.

Carry out filtration of sample under test through membrane filter having pore size of 0.45 μ and diameter of about 47 mm. After the filtration, the membrane is removed aseptically from the metallic holder and divided into two halves. The first half is transferred into 100 ml of culture media meant for fungi and incubated at 20 to 25°C for not less than 7 days. The other half is transferred into 100 ml of fluid thioglycollate medium meant for bacteria and incubated at 30 to 35°C for not less than 7 days. Observe the growth of the media.
Results :If no growth of micro-organism is found in any of the tubes, the sample is declared to have passed the test and the same test is repeated for two times.

4) Write the principle, construction, working and uses of the disintegrator. (Summer-2016, Winter 2017)

Answer: Principle: The Disintegrator works on the principle of impact.
Construction: The Disintegrator consists of a steel drum having a shaft in the center. The shaft contains a disc, on which four beaters are fixed. The shaft rotates with a speed of 5000 to 7000 RPM. The side and upper inner surface of the drum is rough and undulating. The lower part of the drum has a detachable screen or sieve.

Working: The beaters are mainly responsible for grinding but are helped by the undulation of the inner surface and roughness of drum. The material is fed to beaters through a hopper which is fitted to the drum. The material is broken into small particles by impact of the beaters. Due to high velocity of beaters the air velocity inside the chamber is increased. The air is allowed to pass through an outlet on which a dust bag is tied which retains the fine particles of powder.
Use: (1/2Mark) This mill is used to powder all types of drugs including very hard drugs



6) Define evaporation. Explain any four factors affecting the rate of evaporation.

Answer: Definition: Evaporation is the free escape of vapor from the surface of a liquid below its boiling point.

Factors affecting rate of evaporation:

1. Temperature: The rate of evaporation is directly proportional to the temperature of the liquid. The evaporation can be accelerated by increasing the temperature but it will cause decomposition of heat sensitive principles of many drugs. Many glycosides and alkaloids are decomposed at a temperature below 100oC. Hormones, vitamins, enzymes, antibiotics, malt extract need special treatment to avoid decomposition

2. Temperature and time of evaporation: It has been observed that exposure to a relatively high temperature for a short period of time (as in film evaporators) may be less harmful than exposure to a lower temperature for a longer period.

3. Temperature and moisture content: Some drug constituents decompose more readily in the presence of moisture if heated at a high temperature due to hydrolysis. To avoid this, the evaporation is done at a low temperature and then the final drying is done at a high temperature when only little moisture remains in it.

4. Types of product required: The selection of the method and equipment required for evaporation depends upon the type of product required (liquid, semisolid or solid).

5. Effect of concentration: During evaporation the upper layer tends to form a film and there is formation of precipitate in the product which results in lowering down the rate of evaporation. Therefore, efficient stirring is required which will prevent degradation of the product at the bottom due to excessive heat and also prevent deposition of solids.

6. Surface area: The rate of evaporation is directly proportional to the surface area of the evaporator.

7. Vapor pressure of the liquid to be evaporated: The rate of evaporation is directly proportional to the vapor pressure of the evaporating liquid. The rate of evaporation is maximum at its boiling point when the liquid has maximum vapor pressure.

1) Differentiate between Sterilization and Disinfection. Enlist the different methods of sterilization with examples. (Summer-2015, 16, 17 Winter 2019)

Sterilization	Disinfection
It is the process of complete destruction of microorganisms present in the system	It is process that removes infection potential by microorganisms
In case of sterilization spores are destroyed	Spores are not destroyed
Sterilization done by using any physical or chemical or mechanical method	Disinfection is done by using disinfectants
Ex : Ethylene oxide	Ex : Phenol cresol

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