

# SHAMBHUNATH INSTITUTE OF PHARMACY

III<sup>rd</sup> Sessional Examination 2019-2020

D. Pharm. 1<sup>st</sup> year

Subject- Pharmaceutics-I

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Time: - 1.30 hrs.

Roll no. -

Max. Marks: 20

Subject code- 214102

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## 1. Attempt any five questions: (5X4=20)

### I. Write about the packaging of aerosoles.

एरोसोल की पैकेजिंग के बारे में लिखें।

**Answer- Packaging** of therapeutic active ingredients in a pressurized system. Aerosols are depends on the power of compressed or liquefied gas to expel the contents from containers.

### Advantages

- I. A dose can be removed without contamination of materials.
- II. The medication can be delivered directly to the affected area in a desired form, such as spray, steam, quick breaking foam or stable foam.
- III. Irritation produced by the mechanical application of topical medication is reduced or eliminated.
- IV. Ease of convenience of application.
- V. Application of medication in thin layer

### Components of aerosols

1. Propellant
2. Container
3. Valve and actuator
4. Product concentrate container

**1. Propellant** -It is responsible for developing the power pressure within the container and also expel the product when the valve is opened and in the atomization or foam production of the product. For oral and inhalation eg. Fluorinated hydrocarbons Dichlorodifluoromethane

**2. Containers**-They must be stand at pressure as high as 140 to 180psig (pounds per sq. inch gauge). **Metals-** 1. Tinplated steel 2. Tin free steel 2. Aluminum 3. Stainless steel

**Glass-** 1. Uncoated glass 2. Plastic coated glass

**3. Valves** -To delivered the drug in desired form. To give proper amount of medication. Not differ from valve to valve of medication in pharmaceutical preparation. Types - Continuous spray valve - High speed production technique. - Metering valves Dispersing of potent

medication at proper dispersion/ spray approximately 50 to 150 mg±10 % of liquid materials at one time use of same valve.

**Valve components** –a) Ferrule or mount cap b) Valve body or housing c) Stem d) Gasket e) Spring f) Dip tube g) Gasket

**4. Actuator**-To ensure that aerosol product is delivered in the proper and desired form. Different types of actuators Spray actuators Foam actuators Solid steam actuators Special actuators.

**5. Formulation of pharmaceutical aerosols**- Contains two essential components-

- Product concentrate- Product concentrate contains ingredients or mixture of active ingredients and other such as solvents, antioxidants and surfactants.
- Propellant Product concentrate-Propellant may be single or blend of various propellants Blends of propellant used in a pharmaceutical formulation to achieve desired solubility characteristics or various surfactants are mixed to give the proper HLB value for emulsion system. To give the desired vapor pressure, solubility & particle size.

**II. Write a short note on microencapsulation.**

माइक्रोएन्कैपुलेशन पर एक छोटा नोट लिखें।

**Answer-** Microencapsulation is the process by which tiny solid particles or droplets of liquid are surrounded or coated with a continuous film of polymeric material to produce capsules in the micrometer to millimeter range. The product obtained by this process is called as microcapsules.

**A) Multiorifice centrifugal process B) Pan Coating C) Polymerization D) Coacervation Phase Separation E) Electrostatic deposition F) Fluidized Bed Technology G) Vacuum deposition**

**A) Multiorifice centrifugal process;** This is a mechanical process for producing microcapsules. The method is capable of microencapsulating liquids and solids. The particles of the core materials are forced through an envelope of coating material in solution by using centrifugal force. The result is a mechanical microencapsulation of the core particles.

**B) Pan Coating** The particles are tumbled in a pan while the coating material is applied slowly as solution or atomized spray to the core. To remove the coating solvent, warm air is passed over the coated materials or dusting of talc is done.

**C) Polymerization:** In this technique the core material is dispersed in a liquid or a gas in which monomeric units of the coating material are present. These monomers get polymerized at the interface between the core particles and the liquid gas phase which form coats over the core.

**D) Coacervation Phase Separation:** Simple coacervation Complex coacervation A desolvation agent is added for phase separation It involves complexation between two oppositely charged polymers. Steps involved in this process are:-

1)Formation of three immiscible phases. 2)Deposition of liquid coating material upon the core material. 3)Rigidization of coating.

**Coacervation process:**-Various methods to obtain three immiscible phases: 1) Temperature change 2) Incompatible Polymer Addition 3) Non-Solvent Addition 4) Salt Addition 5) Polymer-Polymer Interaction(Complex Coacervation)

**E) Electrostatic deposition :** in this process the core and coating material are electrically charged by means of high voltage such as 10,000 volts etc. The core is charged and placed in coating chamber. The core material is also charged before it is coated. Because the opposite charges are of opposite kind, the coating material gets deposited on the core due to electrostatic attraction.

**F) Vacuum deposition:** In this method the coating material is vaporized in a chamber under vacuum of the order of  $10^{-2}$ mm in which the core material is present. The coating material gets deposited on the core particles.

### III. Discuss the working of autoclave with the help of diagram.

आरेख की मदद से आटोक्लेव के काम पर चर्चा करें.

Answer: Autoclave Sterilizers are used to decontaminate certain biological waste and sterilize media, instruments and lab ware. Regulated medical waste that might contain bacteria, viruses and other biological material are recommended to be inactivated by autoclaving before disposal.

Similar to pressure cookers, steam sterilizer autoclaves work quickly and effectively because of their high temperature. The machine's temperature and unique shape make it easier to hold the heat inside much longer. The autoclave also does a great job of efficiently penetrating each piece of equipment. The autoclave's chambers are usually in the shape of a cylinder because cylindrical shapes are more equipped to handle the high pressure that is needed for the sterilization process to work. For safety reasons, there is an outside lock and a safety valve that prevents the autoclave steam sterilizer's pressure from getting too high.

Once you close the autoclave sterilizer chamber, a vacuum pump removes all the air from inside the device or it is forced out by pumping in steam. If done the first way, the sterilizer is pumped with high pressured steam to quickly raise the internal temperature. On every autoclave there is a thermometer that is waiting for the thermal sweet point, 268-273 degrees Fahrenheit, and then it starts its timer. During the sterilizing process, steam is continuously entering the autoclave to thoroughly kill all dangerous microorganisms. Once the required time of sterilization has elapsed, the chamber will be exhausted of pressure and steam allowing the door to open for cooling and drying of the contents.

Mode of Action Autoclave Sterilizers:

Moist heat destroys microorganisms by the irreversible coagulation and denaturation of enzymes and structural proteins. In support of this fact, it has been found that the presence of moisture significantly affects the coagulation temperature of proteins and the temperature at which microorganisms are destroyed.

**Autoclave Uses & Advantages:**

An autoclave chamber sterilizes medical or laboratory instruments by heating them above boiling point. Most clinics have tabletop autoclaves, similar in size to microwave ovens. Hospitals use large autoclaves, also called horizontal autoclaves. They're usually located in the the Central Sterile Services Department (CSSD) and can process numerous surgical instruments in a single sterilization cycle, meeting the ongoing demand for sterile equipment in operating rooms and emergency wards.

They are important in tattoo shops, beauty and barber shops, dentist offices, veterinarians and many other fields.

**Autoclave disadvantages:**

Autoclave is unsuitable for heat sensitive objects.

**IV. What is filtration and clarification? Describe filter press.**

फिल्टरेशन और स्पष्टीकरण क्या है? फ़िल्टर प्रेस का वर्णन करें।

Answer: **Clarification:** This term is applied when solid do not exceed 1.0% and filtrate is the primary product.

**Filtration:** The separation of solid from a fluid by means of a porous medium that retains the solid but allows the fluid to pass.

**FILTER PRESS:** It consists of hollow frames and solid plates. • Plates have grooved surface to support the filter cloth. • Each plate has an outlet for filtrate. • Frames are opened with an inlet for the liquid to be filtered.

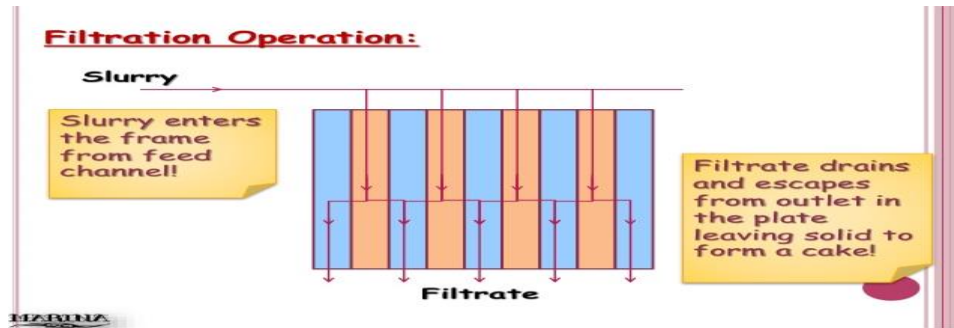
**Working:-**

The working principle of filter presses is that slurry is pumped into the machine such that solids are distributed evenly during the fill cycle. Solids build up on the filter cloth, forming the filter cake; the filtrate exits the filter plates through the corner ports into the manifold, yielding clean filtered water.

Filter presses are a pressure filtration method and as such, as the filter press feed pump builds pressure, solids build within the chambers until they are completely chock-full of solids, forming the cake. Once the chambers are full, the cycle is complete and the filter cakes are ready to be released. In much higher capacity filter presses, fast action automatic plate shifters are employed, speeding cycle time.

**Disadvantages:** • Not economical for filtration of small quantities • Leakage between the plates may take place • Suitable when the slurry contain less than 5% solids.

**Advantages :**• Construction is very simple. • Used for coarse to fine filtration. • Operation and maintenance is easy. • Filter cloth can be easily replaced.



#### V. Write short notes on sugar coating of tablets.

गोलियों के शर्करा कोटिंग पर एक छोटा नोट लिखें।

Answer: sugar coating is done by the pan coating method. It is one of the oldest arts to mask the unpleasant flavors and tastes of medicaments. Various stages in the sugar coating process are:

- 1) Sieving 2) sealing 3) sub coating 4) syrup coating 5) finishing 6) polishing
- 1) **Sieving:** The tablets to be coated are shaken in a suitable sieve to remove the fine powder or broken pieces of tablets.
- 2) **Sealing:** sealing is done to ensure that a thin layer of water proof material such as shellac or cellulose acid phthalate is deposited on the surface of the tablet. A coating pan is made up of copper or stainless steel. The pan is rotated with the help of electric motor. There is an arrangement of hot air to be supplied inside coating pan. The speed of the pan is adjusted in such a way that the tablets remain separated from each other.
- 3) **Sub coating:** In sub coating several coats of sugar and other materials such as gelatin, acacia, etc are given to round off tablets and to help in building up the tablet size.
- 4) **Syrup coating:** This is done to give sugar coats, opacity and colour to the tablet. Several coats of syrup are applied. Coloring materials and opacifying agents are also added to the syrup. The process is repeated until uniform coloured tablets are obtained.
- 5) **Finishing:** 3-4 coats of syrup are applied in rapid succession without dusting powder and cold air is circulated to dry each coat this forms a hard smooth coat.

- 6) **Polishing:** Bees wax is dissolved in volatile organic solvent and a few coats of it are given. The finished tablets are transferred to polishing pan which is made of canvas cloth. The polishing pan is rotated at a suitable speed so that wax coated tablets are rubbed on canvas clothes, this gives a proper shining in the tablets.