



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 anyequivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
- 6) In case of some questions credit may be given by judgement on part of examiner of relevant answer based on candidate's understanding.
- 7) For programming language papers, credit may be given to any other program based on equivalent concept.

Q. No.	Sub Q. N.	Answer	Marking Scheme
1.		Attempt any EIGHT of followings:	16
	a)	What is lyophilization?(2M) Lyophilization or freeze drying is a process in which water vapour is removed from a frozen solution by sublimation by subjecting to low pressure (vacuum) and temp below triple point , allowing the ice to change directly from solid to vapour without passing through a liquid phase.	2M
	b)	Define the term “phagocytosis and antibodies”.(1 + 1 = 2M) Phagocytosis is the process of ingestion of bacteria by certain cells of the body ,which make them harmless. Antibodies are immunoglobulin produced mainly in the body in response to the presence of foreign proteins and certain other material in tissues(antigens).	2M
	C)	Enlist the different filter medium used for filtration.(0.5 X 4 = 2M). i) Filter paper. ii) Cotton wool.	2M



iii) Glass wool.

iv) Asbestos.

v) Fine muslin.

vii) Filter Membrane filter.

viii) Sintered glass filter.

d)

Explain the terms. (1 Mark each definition)

Arka: It is the liquid preparation obtained by distillation of certain liquid or crude drug soaked in water using distillation unit.

They are used in fever, dyspepsia and as cooling lotion when applied externally.

Svarasas: These are fresh expressed juices prepared by crushing green fresh medicinal plants in a mortar and expressed and then strained through a clean muslin cloth.

e)

Define emulsion.(2M)

Emulsion is a biphasic liquid preparation containing two immiscible liquids, one of which is dispersed as minute globules into other phase that is continuous phase and made miscible by addition of emulsifying agents.

f)

Why capsule are preferred to powder. (0.5X4=2)

- Drug with unpleasant taste and odor can be administered.
- Very smooth and slippery.
- Economical.
- Easy to handle.
- Made of gelatin, hence inert.
- Attractive in appearance.
- Available in various sizes.

g)

Mention the application of liposomes in pharmacy.(0.5 X 4 = 2M)

- i) Used in disease caused by intracellular parasites e.g. malaria, tuberculosis and amoebiasis.
- ii) Liposomes entrapped insulin active orally and can be replaced by intramuscular

2M

2M

2M

(2M)

administration if insulin.

iii) Liposomes can be used to transport radio-pharmaceutical and immunoglobulin.

iv) Liposomes can be used to transport functional DNA/RNA molecules into cell.

v) Liposomal daunomycin has longer duration of action than free daunomycin which is used in treatment of neoplasia.

vi) Liposome entrapped actinomycin-D and nitrogen mustard are more effective than parent drug.

h)

Explain the importance of closures. (0.5 X 4 = 2M)

Closures are used:

- To prevent loss of material.
- To avoid contamination.
- To prevent deterioration.
- To prevent spoilage.

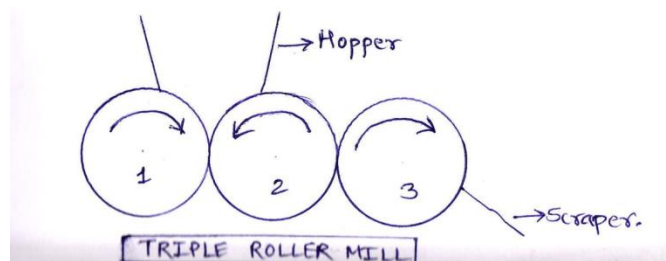
i)

What are the different mechanisms involved in the method of size reduction. (2M)

- Cutting.
- Compression.
- Impact
- Attrition
- Combined impact and attrition

j)

Draw well labelled diagram of "triple roller mill".



(2M)

2M

2M



k)

Give the difference between “purified water and “water for injection”

Purified Water	Water for injection
1) Water which is free from volatile and non-volatile impurities is called as purified water.	1) Water which is free from volatile and non-volatile impurities, micro-organisms and pyrogens is called as water for injection.
2) It may contain pyrogens.	2) It is free from pyrogens.
3) It can't be used in parenteral preparations.	3) It can be used in parenteral preparations.
4) pH is 4.5 to 7.0	4) pH is 5.0 to 7.0.
5) It is supplied in large volume.	5) It is supplied in small volume.
6) It is used for long duration.	6) It must be used within 24 hours for parenteral preparations.

(2M)

l)

Why enteric coating is given to the tablets. (0.5x4=2M)

- i. To control the site of action of drugs.
- ii. Drug absorption is better in intestine
- iii. for drugs producing severe irritation in stomach.
- iv. To produce the sustained release product.
- v. To prevent the drug degradation in stomach pH.

2M

Q.2

a)

Attempt any FOUR of followings:

List qualities of an ideal filter aid and state any two example of it.

Ideal qualities of filter aid: 0.5 X 4=2M

- i. It should be remain suspended in the liquid.
- ii. It should be free from impurities.
- iii. It should be inert.
- iv. It should have a particle size distribution suitable for retention of solid.
- v. It should have structure that permits formation of porous cake.

(3M)

Examples of filter aid :(0.5X2=1M)

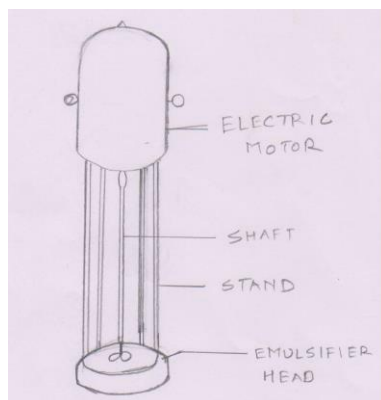
- i. Asbestos.
- ii. Cellulose.
- iii. Carbon.
- iv. Diatomaceous earth (silica).
- v. Perlite.

b) Explain construction and working of silverson mixer homogenizer.**Construction (1Mark)**

- It consists of emulsified head which is covered with fine meshed stainless steel sieve.
- The emulsifier head consist of a number of blades which rotates at a very high speed, to produce powerful shearing action.
- The blades are rotated by using an electric motor fitted at the top.

Working: (1Mark)

- The emulsified head is placed in the vessel containing immiscible liquid, in such a way that it should get dipped into it.
- When the motor is started, the liquid is sucked through the fine holes and the oil is reduced into fine globules due to the rotation of blades.
- So a fine emulsion is produced which is then expelled out.

Diagram: (1Mark)

c)

Define sieve number and enlist standards for sieves as per IP.**Sieve Number: (1M)**

It is the number of mesh in 2.54cm transverse direction parallel to wire.

(3M)

(3M)



According to I.P standards for sieves are as follows(0.5X4=2M)

- Approximate sieve number
- Nominal mesh aperture size
- Approximate percentage of sieving area
- Tolerance average aperture size

According to I.P. sieves must confirm the above mentioned specifications for the given sieve number.

Give principle, working and application of autoclave.

d)

Principle: (1 Mark)

- Moist heat sterilization is a method of sterilization in which steam is used for sterilization.
- The steam has more penetration power and more thermal capacity than dry heat.
- The steam penetrates the spores & capsules of bacteria causing rupture and coagulation of protoplasm.

Working: (1 Mark)

A sufficient quantity of water is poured into the chamber after removing the perforated chamber. The level of the water is adjusted in such a way that it does not touch the bottom of the perforated chamber. The lid is then closed with wing nuts and bolts. The autoclave is switched on to heat the water. The vent is opened and safety valve is set at the required pressure. When steam starts coming out from the vent and it continues for 5 minutes, it is then closed. The steam pressure starts raising and it comes to the desired pressure i.e. 10 lbs/sq inch with corresponding temp 115°C or 15 lbs/sq inch with corresponding temp 121°C After the stated period, switch off the autoclave. Allow it to cool to about 40°C before opening the vent. When whole of the steam is removed, the lid is opened and the sterilized material is taken out.

Applications: (Any two 1 Mark)

- The method is used for sterilization of surgical dressings and surgical instruments.
- The plastic containers and rubber closures are sterilized by autoclaving.
- Used for sterilization of a majority of official injections and eye drops.

e)

Discuss the excipients used in filling of hard gelatin capsule. (1x3 Marks)

i. **Diluents:**

3M

3M



To increase bulk, e.g. lactose, sorbitol, starch etc.

ii. **Absorbents:**

Eutectic or hygroscopic drug need absorbent for, e.g. oxides and carbonates of magnesium and calcium.

iii. **Glidants:**

To ensure a regular flow of powder, e.g. talc and magnesium stearate.

iv. **Antidusting agents:**

During filling of capsule in automatic filling machine a lot of dust comes out to avoid this Antidusting agent added e.g. inert oils.

f)

State salient features of the fourth edition of pharmacopoeia of India(0.5x6 Marks)

1. It contain 1149 monographs and 123 appendices and available in Two volumes.
2. Computer generated structural formulas.
3. Titles changed to common e.g. Hyoscine Hydrobromide for scopolamine hydrobromide.
4. Infra-red and UV Spectrophotometric test added alternative to chemical test.
5. HPLC used for analysis e.g bioassay of insulin replaced with HPLC.
6. Test for bacterial endotoxin substitute to pyrogen test introduced.
7. A number of general monographs have included.
8. Quantitative test for determination of particulate matter in injectable replaced by quantitative test of previous edition.
9. Bioassay provided for vaccine.
10. ORS-Citrate formula recommended by WHO introduced.

3M

Q.3

a)

Solve any FOUR of the following.

Give the principle, working and application of" Fractional distillation.

Principle of fractional distillation: (1 Mark)

- It differs from simple distillation in that Partial condensation of vapour is allowed to occur in a fractionating column through which the vapour must pass before reaching the condenser .
- This column enables ascending vapour from the still to come in contact with the condensing vapour returning to still. This results in enrichment of the vapour in the more volatile component.

12

3M

Working: (1 Marks)

- The mixture of miscible liquids is heated in the still. The vapours formed are allowed to pass through the fractionating column, where a part of the vapour is condensed & while returning to the still comes, into an intimate contact with the rising power.
- This leads to further fractionation of the liquid being distilled.
- The liquid with higher boiling point is condensed first & vapour becomes richer with the liquid having the lower boiling point which gets condensed in a condenser.

Applications of “ Fractional distillation “ are as follows :- (1 Mark)

- Alcohol is purified from the mixture of alcohol & water obtained from fermentation tank.
- It is used for the separation of miscible liquids, such as alcohol & water, acetone & water, Chloroform & Benzene.

b)

Define The term Clarification. Write the working of filter candle with neat diagram.

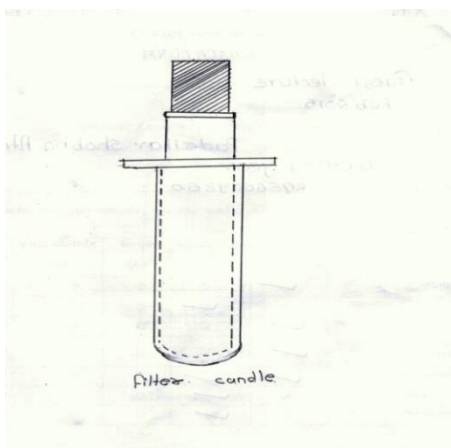
3M

Clarification:-(1 Marks)

When solids are present in a very small proportion i.e. not exceeding 1.0 % the process of its separation from liquid, is called clarification.

Working :- (1 Marks)

- 1) These are ceramic filters & are made of porcelain or kieselghur.
- 2) The candle is placed in the solution be filtered.
- 3) When vacuum is applied, the liquid will pass through the thick wall of the candle & gets collected inside the candle from where it is removed.

Diagrams(1mark)

c)

State and explain the stages of simple Percolation

3M

Stages of Percolation:-

- a) Imbibition
- b) Maceration
- c) Percolation

a) Imbibition :- (1 Mark)

- 1) Powders drug is moistened with a sufficient quantity of menstruum & allowed to stand for 4 hrs in a closed vessel.
- 2) Pack the moistened drugs into a percolator & add sufficient quantity of menstruum to saturate the material.
- 3) When liquid starts coming out from the outlet of percolator, the outlet is closed. Then sufficient quantity of menstruum is added in order to leave a layer above the drug.

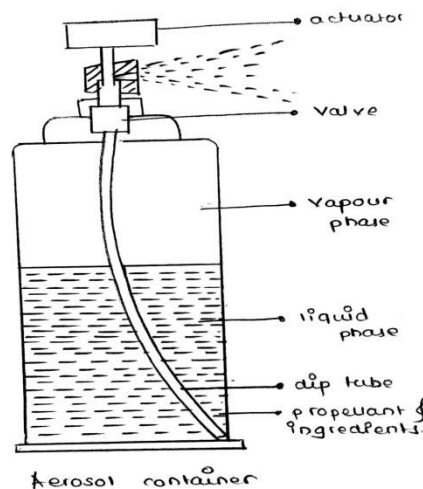
b) Maceration :- (1 Mark)

- 1) The moistened drug is left in contact with menstruum for 24 hours.
- 2) During this period, the menstruum dissolves the active constituents of the drug & becomes almost saturated with it.

c) Percolation :- (1 Mark)

It consists of the downward displacement of the saturated solution formed in maceration and extraction of the remaining active constituents present in the drug by the slow passage of the menstruum through the column of the drug.

Draw a well labelled diagram of aerosol container and state method of aerosol packaging.

d) Diagram of aerosol container (1,1/2 Marks)

Depending on the nature of the product concentrate the aerosol can be filled by cold filling or pressure filling process

(explain any one 1,1/2 Marks)

1) Cold-filling fill process:-

- i) This process to fill metered aerosol products using a fluorocarbon propellant.
- ii) By lowering the temperature of a propellant below its boiling point, the propellant becomes liquid at atmospheric pressure.
- iii) The active ingredients or concentrate & propellant are cooled to a low temperature of

3M



about- 30° to- 40°f.

- iv) The concentrate is generally cooled to below 0°c in order to reduce loss of propellant
- v) During the filing operation the chilled concentrate is poured into the chilled container & propellant is added.
- vi) Sufficient time is given for the propellant to partially vaporize, in order to expel the air present in the container.

2) Pressure- fill process:-

- i) This process is used for filling aerosol containing hydrocarbon propellant.
- ii) The product concentrate is placed into the container & the valve is sealed.
- iii) The propellant is forced through the valve under pressure.
- iv) After this the container is immersed in a water bath at 130°F. in order to check any leakage & strength of the container.
- v) It is essential that the air present in the container must be expelled before filing the contents in to the aerosol container.

List the importance of size reduction in pharmaceutical industries.

e) **Importance of size reduction ;-(0.5 x 6=3 Marks)**

3M

- i) To increase the rate of solution in case of chemical substance because reduction of particle size, increases the surface area for the action of solvent.
- ii) To allow the rapid penetration of the solvent
- iii) To get a uniform powder, this helps in uniform mixing of drugs.
- iv) To increase the rate of absorption of drugs.
- v) To improve stability of certain pharmaceutical dosage form.
- vi) To help in the process of suppression of solid form liquids by filtration.

Explain the principle and construction of Planetary Mixer.

f)

Principle :- (1Mark)

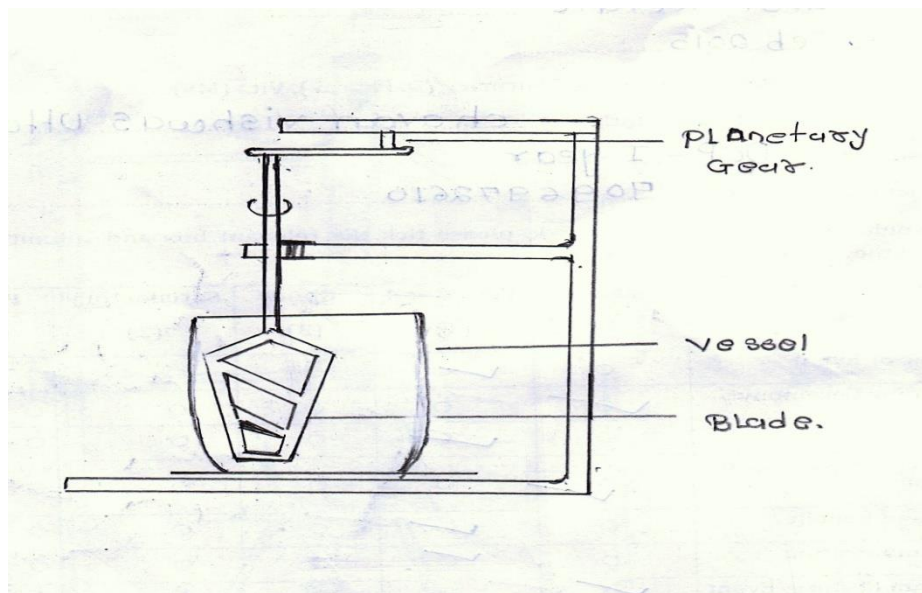
- The planetary mixer consists of stationary vessel & anchor shape blade which has planetary motion.
- The anchor shape blade rotates on its axis & axis moves around .

3M

Construction:-(1 Mark)

- i) It consists of a stationary vessel which is made up of stainless steel.
- ii) The vessel can be removed either by lowering it beneath the blade or raising the blade above the vessel
- iii) The moving blade mounted from the top of the vessel.
- iv) The mixing shaft is driven by planetary gear connected to an electric meter.

Diagram (1 Mark)



Q.4

a)

Attempt any FOUR of followings:

Differentiate between maceration process for organised drugs and maceration for unorganised drugs. (3 Marks)

12

3M

Organised Drugs		Unorganised drugs.	
1.	Drug along with whole menstruum is used in maceration process	1.	Drug along with 4/5 th of menstruum is used in maceration process
2.	The period of maceration is 7 days	2.	The period of maceration is 2-7 days
3.	Strain off the liquid and press the marc	3.	Decant the liquid. Marc is not pressed.
4.	Mix the pressed liquid with the macerate and clarify by subsidence or filtration.	4.	Filter the liquid and pass the remaining 1/5 th of menstruum .
5	Final volume is not adjusted	5	Final volume is adjusted



6.	Examples of tincture made by this process are: a. Tincture of Orange b. Tincture of Lemon c. Tincture of Capsicum	6.	Examples of tincture made by this process are: a. Tincture of Tolu b. Tincture of Myrrh c. Tincture of Benzoin
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3M

b)

Explain The theory of freeze drying and state its application.**Theory:-(2 Marks)**

- i) In this process, the material is frozen in a suitable container connected to a high vacuum system, so that the vapour pressure of water vapours is reduced to less than that of the material being dried.
- ii) Thus, it reduces the temperature & pressure to values below the triple point.
- iii) Under this condition, any heat transferred is latent heat & ice sublimates directly to the vapour state.
- iv) The water vapour is removed from the system by condensation in a condenser maintained at a temperature lower than a frozen material.

Application :-(1Mark)

Used for drying of biological products such as antibiotics, blood products, vaccines, enzymes preparation, microbiological cultures & other thermo labile pharmaceutical substances.

c)

Draw a well labelled diagram of Vacuum still and describe its theory.

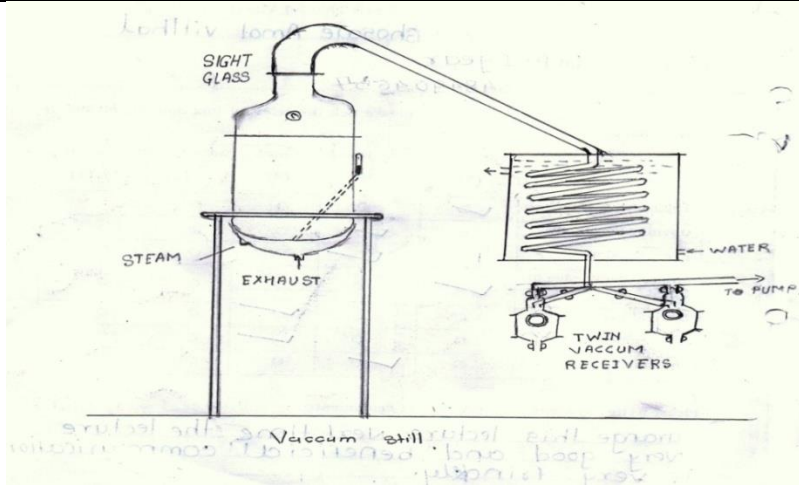
3M

Theory :- (1.5 Marks)

- Liquid boils at lower temperature when pressure on the surface of the liquid is reduced.
- Therefore, when distillation is carried out under reduced pressure the rate of distillation increases.
- Thus liquids which are unstable at their boiling points, at atmospheric pressure may be distilled at much lower temperature under reduced pressure.

Ex: In case of water, if external pressure is reduced to 70mm it will boil at 40 °c, instead of its normal boiling point 100 °c, at atmospheric pressure (760 mm of Hg).

Diagram: (1.5 Marks)



d) **Classify the methods of sterilisation with example.**

3M

Method of sterilization :- (3 Marks)

A) Physical method

- Dry heat sterilization e.g. hot air oven
- Moist heat sterilization e.g. Autoclave
- Radiation sterilization
 - a) Use of ultra violet rays
 - b) Ionising radiation.

B) Chemical method :

- sterilization by heating with bactericide
- Gaseous sterilization

C) Mechanical method :-

Sterilization involves the filtration of parenteral preparation through the following bacteria proof filters,

- Ceramic filters
- Seitz glass filter
- Sintered glass filters
- Sintered metal filters
- Membrane filters

e) **State and explain the steps involved in sugar coating of tablet.**

3M

Steps of sugar coating of tablet:- (0.5x 6 points= 3 Marks)



- Sieving
 - Sealing
 - Sub-coating
 - Syrup coating
 - Finishing
 - Polishing
- i) Sieving :- The tablets to be coated are shaken in a suitable sieve to remove the fine powder or broken pieces of tablets
- ii) 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 tablets.
 - The shellac or cellulose acid phthalate is dissolved in alcohol or acetone & its several coats are given in coating pan.
 - A coating pan is made up of copper or stainless steel.
 - The pan is rotated with the help of an electric motor.
- iii) Sub coating :-
- In sub coating several coats of sugar & other material such as Gelatin, Acacia etc. are given to round of tablet and to help in building up to tablet size.
 - Several coats of concentrated syrup containing acacia or gelatine are given.
 - After each addition of the syrup , dusting powder is sprinkled.
 - The dusting powder is a mixture of starch, talc & Powdered acacia.
- iv) Syrup coating :-
- This is done to give sugar coats, opacity & colour to tablets
 - Several coats of the syrup are applied
 - Colouring materials & opacity agent are also added to the syrup
 - The process of coating is repeated until uniform coloured tablets are obtained
- v) Finishing :-
- Three to four coats of sugar are applied in rapid succession without dusting powder and cold air is circulated to dry each coat. Thus forms a hard smooth coat
- vi) Polishing :-



- Beeswax is dissolved in volatile organic solvent & a few coats of it are given,
- The finished tablets are transferred to a polishing pan is rotated at a suitable speed so the wax coated tablets are rubbed on the canvas cloth.
- This gives a proper shining to the tablets
- Sugar coating is an art

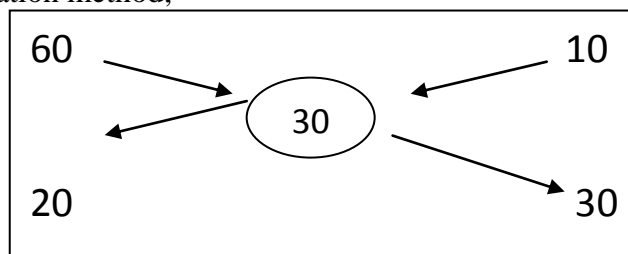
f)

How many ml of 60% w/w syrup and 20% w/w syrup are required to prepare 300 ml of 30% w/w syrup.

Calculation:(1 Mark)

Percentage of Syrup Required= 30% w/w of 300 ml syrup

By using allegation method;



(1 Mark)

Quantity of 60% Syrup used= $\frac{300 \times 10}{40} = 75$ ml

Quantity of 20% Syrup used= $\frac{300 \times 30}{40} = 225$ ml

Result:(1Mark)

Thus 75 ml of 60% and 225 ml of 20% syrup is required to be mixed to prepare 300ml of 30% syrup.

Q.5

a)

Attempt any FOUR of the following .

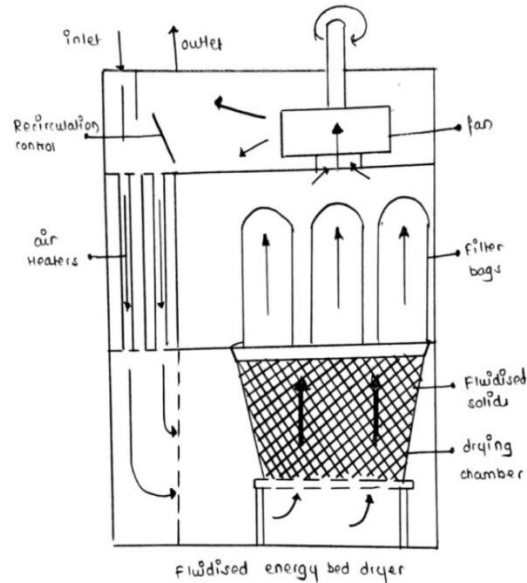
Draw the labelled diagram of “Fluidized bed dryer” and state its disadvantages.(2 +1)

Fluidized bed dryer.(2 marks)

3M

12

3M



Disadvantages: (Any two disadvantages 1 mark)

- 1) Production of fines
- 2) Generation of electrostatics charges amongst the particles
- 3) Contamination due to erosion of pipes and vessels due to abrasion by particles.

b) **State difference between hard and soft gelatin capsules.**

(1/2 mark for each point and at least 6 points)

3M

SR. NO	HARD GELATIN CAPSULES	SOFT GELATIN CAPSULES
1.	The hard gelatin capsule shell consists of two parts: Body and cap	The soft gelatin capsule shell becomes a single unit.
2.	They are cylindrical in shape	They are available in round, oval and tube-like shapes.
3.	The contents usually consist of medicaments in the form of powder, beads or granules.	The contents usually consist of liquids or semisolids.



4.	These are prepared from gelatin, titanium dioxide, coloring agent and plasticizer.	These are prepared from gelatin, more amount of plasticizer (sorbitol or glycerin) and preservative.
5.	Filling and sealing takes place in different steps	Filling and sealing are done in a combined operation of machines.
6.	Shell is perfectly dry,	Shell is not perfectly dry.
7.	These capsules can be adulterated.	These capsules cannot be adulterated.
8	Ex. Amoxicillin capsule	Ex. Pudin Hara capsule

c)

Give principle and working of “Fluid Energy mill”(1+ 2)

3M

Principle: (1mark)It works on the principle of combined impact and attrition.

Working (2marks)

1. The material which is to be size reduced is fed in the grinding chamber from the bottom through the feed inlet.
2. The air or inert gas is introduced with a very high pressure through nozzles.
3. Due to high degree of turbulence, impact and attritional forces between the particles there is size reduction.
4. The air moves at a very high speed in elliptical part carrying with it fine particles that pass through the outlet in a classifier and are collected.
5. The large particles are carried by centrifugal force to the end whereby they are further exposed to the moving air.
6. The design of the mill provides for the internal classification of the particles whereby lighter, finer particles are discharged and heavier particles are retained due to effect of centrifugal force to be reduced to smaller size.
7. Feed should be of 20 to 200 # size & mill produces particles of 1 to 30 micron range to get a very fine powder even up to 5 μ , the material is pre-treated to reduce the particle size to the order of 100# and then passed through fluid energy mill

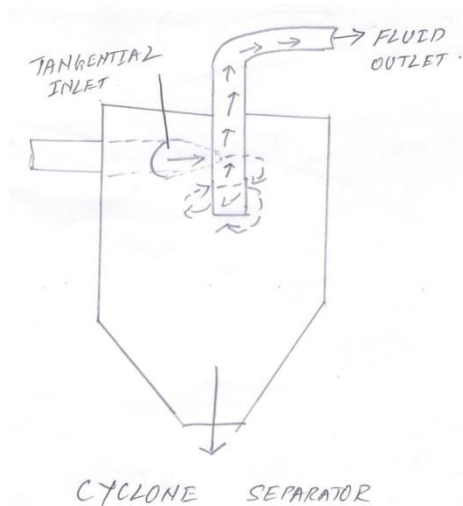
d)

Explain the construction and working of cyclone separator. .

3M

Construction: (1mark)

- Cyclone Separator' is size separation device.
- It consists of a cylindrical vessel with a conical base.
- The upper part of the vessel is fitted with a tangential inlet and a fluid outlet.
- At the base it is fitted with solid outlet.

Diagram(1mark)**Working of cyclone separator: (1mark)**

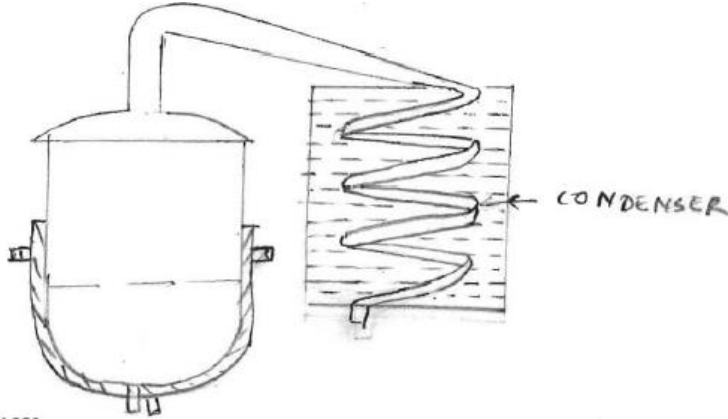
The suspension of a solid in gas (usually air) is introduced tangentially at a very high velocity so that rotary movement takes place within the vessel. The fluid is removed from a central outlet at the top. The rotator flow within the cyclone separator causes the particles to be acted on by centrifugal force. The solids are thrown out to the walls; thereafter it falls to the conical base and discharged through the solids outlet

3M

e) **Explain construction and working of “Evaporation Still”(1+1+1)**

Construction:(1mark)

- It consist of a hemispherical pan made from copper or stainless steel.
- It is surrounded by a steam jacket.
- Still is covered from top and connected to the condenser.
- Hemispherical shape provide large surface area for evaporation.
- It consist of product outlet at bottom.

Diagram(1mark)

Product outlet

Working:(1mark)

- 1) The dilute liquid is fed into the still and the cover is clamped
- 2) Steam is introduced in to the jacket
- 3) The liquid is evaporated and condensed into the condenser
- 4) The product is collected through product outlet.

f) **What do you mean by “Tyndallisation” and “Pasteurisation”. State the methods of pasteurisation.(1+1+1)**

Tyndallisation(1mark)

This is a fractional sterilization method. This method is used for sterilization of medicaments unstable at 115°C but able to withstand low temperature heating. This method consist of heating the material at 80°C or 100°C for 1 hour on three successive days presuming that on the first day all vegetative bacterial cells will be destroyed and the spores may germinate in the days to follow and will be killed subsequently.

Pasteurization:(1mark)

It is a partial sterilization method which is used to make milk safe and also to improve its keeping properties. The process kills only 97 to 99 percent micro-organisms, but it does

3M



not kill bacterial spores

Methods of pasteurisation are as follows: (Any two 1mark)

- Low Temperature Long Time (LTLT)
- High Temperature Short Time (HTST)
- Vat pasteurization
- Ultra High Temperature(UHT)

Q.6

Attempt any FOUR of the following

16M

4M

a)

Write reasons and remedies for “ Capping” (2+2)

Reasons: (Any four 2mark)

- Excessive fine.
- Defective punch and die.
- High speed of machine.
- Granules too dried.

Remedies: (Any four 2mark)

- Setting the die and punch properly.
- Reduce % of fine.
- Punches should be polished.
- Maintain the desire moisture in granules.
- Maintain the speed at optimum.
- Regulate the pressure of punches.

b)

Define and classify immunity (1+3)

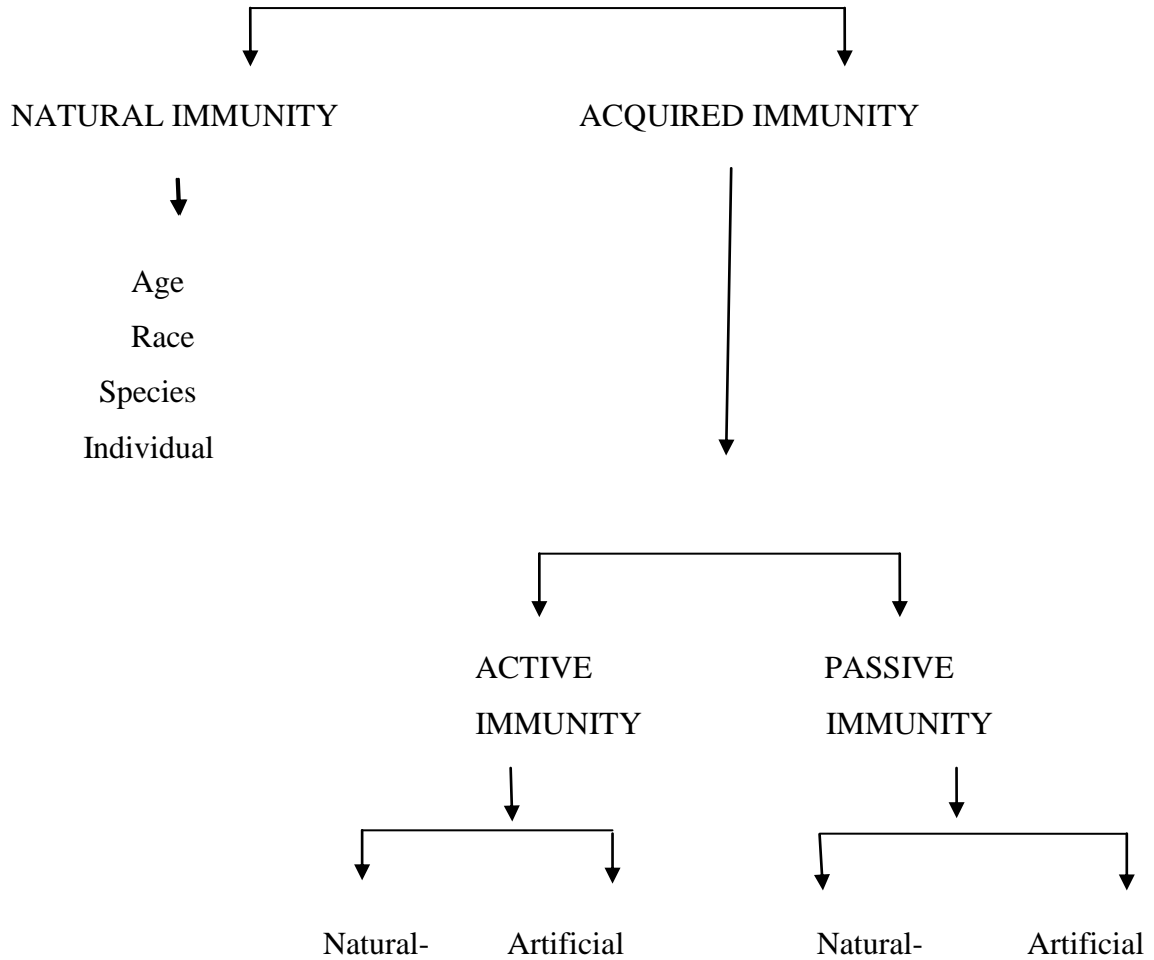
Definition: (1mark)

The capacity or power of the body to resist and overcome infection is called as **immunity**

Classification: (1mark):TYPES OF IMMUNITY

4M





Natural immunity(2 Marks)

- **Age** : Majority of children in the age group between 2-5 years are susceptible to diphtheria disease, whereas adults are immune to it.
- **Race** : While the negroes have a high resistance to yellow fever, the white races are very susceptible to it.
- **Species**: Men are susceptible to typhoid fever, whereas mice are immune to it.
- **Individuals**: Some persons have more resistance against cold and skin diseases than others.

Acquired Immunity

(i) Naturally acquired active immunity

- Body takes active part in formation of antibodies
- **The infection stimulates the body to produce antibodies, which remain in the**

**body to immune the person.**

- Immunity may last for a life time *e.g.* small-pox, polio *etc.*,
- May be for a short duration *e.g.* pneumonia, influenza

(ii) Artificial acquired active immunity

- When **the antigenic substances** such as vaccines are introduced into the body, it stimulates the body, to produce antibodies.
- It is produced by **injecting** attenuated living micro-organisms, dead bacteria and bacterial derivatives. The process is also called immunization.

Passive immunity

- The body does **not play an active role** in, having immunity against a disease.
- It **receives readymade antibodies** to produce immunity.

(i) Naturally acquired passive immunity

- Children aged less than a month, are generally immune to certain infectious diseases. This is because they have received the antibodies from the mother.
- The antibodies of diphtheria, measles and chicken-pox are transmitted in this way.

(ii) Artificial acquired passive immunity:

- The immunity is produced by injecting ready-made antibodies containing preparation (antiserum, sera) into the body
- It lasts for a short time only.

c)

Define desiccation with two example of Desiccants and draw a diagram of “ Desiccator”**(1+1+2)**

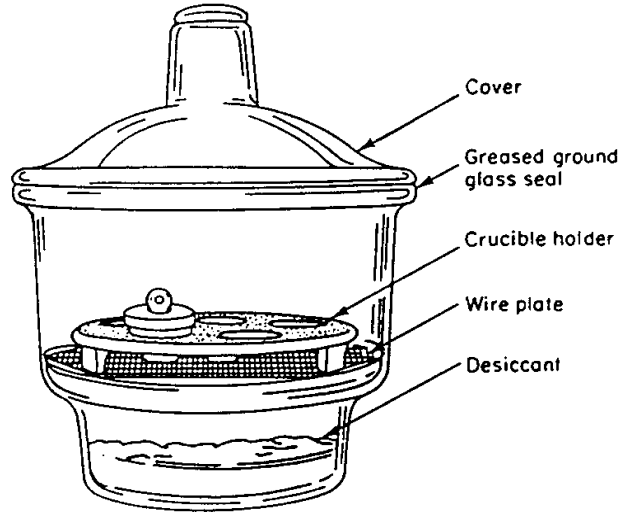
Definition:(1mark)Desiccation is the process of complete removal of mechanically admixed water from substances.

Examples of desiccants:(Any two 1mark)

Silica, activated charcoal, calcium sulfate, calcium chloride, and molecular sieves.

Diagram:(2marks)

4M

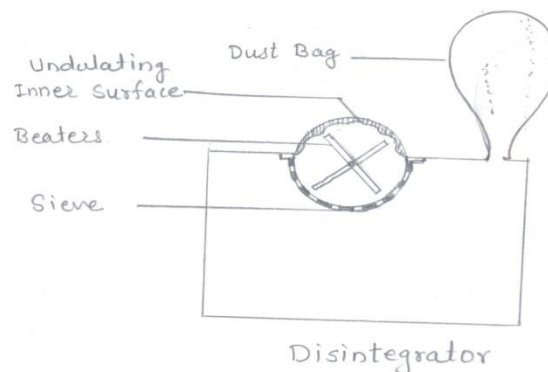


d) State the principle, construction, working and uses of “ Disintegrator” (1/2+1+1+1+1/2)

Principle: (1/2 Mark) The Disintegrator works on the principle of impact.

Construction: (1 mark) The Disintegrator consists of steel drum having a shaft in the centre. 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.

Diagram(1 mark)



Working:(1Mark)

4M



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 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 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.

Differentiate between Liniment and lotion

e) (1/2 mark for each point and at least 6 points)

4M

Sr.No.	Liniment	Lotion
1	Liniments are liquid or semi-liquid preparations	Lotions are liquid preparations meant for external application
2	Liniments are viscous	Lotions are slightly less viscous than liniments
3	They are used for counter irritant, rubefacient, soothing or stimulating purpose.	They are used for topical effect such as local cooling, soothing protective & emollient effect.
4	Applied with friction	Applied without friction.
5	Vehicle is mostly oily or alcoholic	Vehicle is mostly aqueous.
6	These are used for application to the unbroken skin.	Lotions are applied on broken skin.
7	Applied directly	Applied with cotton gauze
8	Ex: Turpentine liniment	Ex: Sulphur lotion

f) **Write advantages and disadvantages of plastic as a material for container and state its type.**

4M

Advantages: (Any 2, 1 mark)



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: (Any 2, 1 mark)

1. Permeable to water vapour and atmospheric gases.
2. Cannot withstand heat without softening or distortion.
3. May interact with certain chemical 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.

Types (2 Marks)

A) Thermosetting type:

Ex: Phenol formaldehyde resin and. Urea formaldehyde resin.

B) Thermoplastic type:

Ex: Polyethylene terephthalate (PET or PETE)

High-density polyethylene (HDPE)

Polyvinyl chloride (PVC)

Low-density polyethylene (LDPE)

Polypropylene (PP)

Polystyrene (PS)

Polyester (PES) etc.



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WINTER- 16 EXAMINATION

Model Answer

Subject Code :

0805