DCP answer key (QP code 27835)

Q.1.a Explain the need for dosage forms? (2) - Any 4 points

1. To provide for the safe and convenient delivery of accurate dosage
2. For the protection of a drug substance from the destructive influence of atmospheric oxygen or moisture. Examples: coated tablets, sealed ampoules
3. For the protection of a drug substance from the destructive influence of gastric acid after oral administration. Example: enteric coated tablets
4. To provide liquid preparations of substances those are either insoluble or unstable in the desired vehicle. Example: suspension
5. To conceal the bitter taste, salty obnoxious or odour of a drug substance. Examples: Capsules, coated tablets, flavoured syrups
6. To provide liquid dosage forms of substances soluble in desired vehicle. Example: solution
7. To provide extended drug action through controlled release mechanisms. Examples: controlled release tablets, capsules, suspensions
8. To provide optional drug action from topical administration sites. Examples: ointments, creams, ophthalmic, ear and nasal preparations
9. To provide for insertion of a drug into one of the body's orifices. Examples: rectal and vaginal suppositories
10. To provide for the placement of drugs within body tissues. Examples: implants
11. To provide for the optimal drug action through inhalation therapy. Examples: inhalants and inhalations
12. Dosage forms permit ease of drug identification through distinctiveness of colour, shape, or identifying markings

Q.1.b Give in general the compounding and dispensing procedure (2)

a) Read prescription carefully
b) Consult pharmacopoeia or any other reference book
c) Check the doses of preparations meant for internal use
d) Check for an incompatibilities
e) Choose and collect proper container and closure
f) Refer books for storage conditions
g) Work out and check the calculations
h) Prepare appropriate label
i) Make preparation
j) Transfer it to container and polish the container
k) Fix the label to the container
l) Wrap the container
m) Write the name and address of the patient
n) Maintain the prescription record

Q.1.c Explain dispensing of proprietary medicines. (2)

Proprietary medicines can be dispensed in 2 ways:

1. From a manufacturer's bulk container

This includes:

a) Pouring the prescribed volume of liquid from a bottle usually holding 500 ml to 2 litres into a container of appropriate size

b) Counting out the required number of a unit dosage form like tablets or capsules from a tin or bottle usually holding from 100 – 1000 units and packing them into a container of appropriate size.

Exceptions: some medicines cannot be repacked if they fall under the following 2 categories:

i. Proprietary preparations requiring addition of a vehicle during dispensing. Eg oral antibiotic suspensions which are supplied as dry powder

ii. Proprietary medicines in special container: eg aerosol cans.

Some key points to be remembered when repacking from the manufacturer's bulk container include:

i. The container should be selected carefully. As far as possible a container similar to the original container of the bulk medicines supplied by the manufacturer should be used. Special attention should be given to light resistance, the fit of closure and the size of mouth.

ii. The product should not get damaged during repacking.

iii. Each medicine should be packed in individual containers to avoid confusion. Especially if the medicines are of one type eg 2 white coloured tablets should not be packed together.

iv. Any caution as mentioned on the manufacturer's label should appear on the label used for dispensing.

2. In manufacturer's original pack

Many medicines are issued in small individual packs coinciding with the most popular quantities ordered on prescription. Eg aerosols, ointments etc

Some key points to be considered while dispensing in the original pack include:

i. All literature eg leaflets should be removed unless clearly intended for the patient as these are normally meant for the doctors and may worry a patient

ii. A dispensing label should be attached without hiding the manufacturer's label. If an overlap in unavoidable, the name and strength of the product, directions for use and storage instructions should not be hidden. The dispensing label should give the name of the patient and the name and address of the pharmacy.

Q.1.d Prepare 500 ml of 20% alcohol from 95% alcohol. How many proof gallons are there in 3 gallons of 70% alcohol? (2)

V1 = 500 X 20/95 = 105 ml.

105 ml of 95% alcohol should be diluted to 500 ml with water to get 20% alcohol. (1 mark)

Proof strength = (70 X 1.753) – 100

= 122.71 – 100

= 22.71

100 gallons of 70% alcohol has 122.71 proof

Thus, 3 gallons of 70% alcohol have X proof

X = 3 * 122.71/100 = 3.68 proof gallons (1 mark)

Q.1.e Enlist instability of emulsion and explain any one. (2)

The instability issues of emulsion are:

a) Coalescence -
b) Flocculation
c) Creaming
d) Cracking
e) Phase inversion

(1 mark for enlisting and 1 marks for the description of any 1 instability)

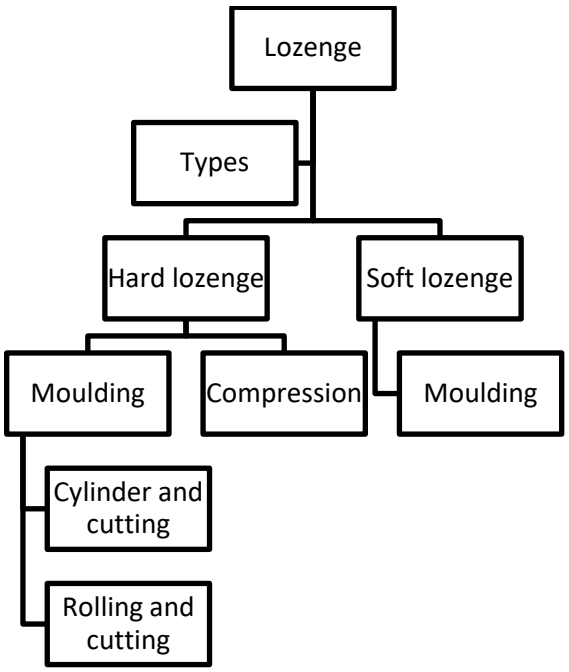
Q.1.f Differentiate between pastes and ointment (2) (Any 4 points)

Sr. no	**Pastes**	**Ointments**
1	They contain large amount of finely powdered solids	They contain medicaments which are dispersed/ solubilised or emulsified in base
2	They are thick and stiff	They are softer in consistency
3	They are less greasy	They are more greasy
4	They are generally applied with a spatula or applied on lint	Applied directly on skin
5	Perspiration can escape	Perspiration cannot escape easily
6	They are less macerating	They are more macerating

Q.1.g Write a short note on lozenge (2)

Lozenges are solid dosage forms that are intended to be dissolved slowly in the mouth. They contain one or more active ingredients, gums and are flavoured and sweetened so as to be pleasant tasting. A lozenge may contain a demulcent or an antiseptic.

Method of preparation of lozenges:



Packaging: Packed in air tight container or strip packing

Labelling direction: To be sucked slowly

Do not drink water immediately after consumption

Q.1.h Enlist types of incompatibilities and explain insolubility as physical incompatibility (2)

Types of incompatibilities are:

1. Physical
    a. Immiscibility
    b. Insolubility
    c. Precipitation
    d. Liquefaction of solids
2. Chemical
    a. Precipitation
    b. Evolution of gas
    c. Decomposition
    d. Colour change
    e. Explosion
    f. pH changes
3. Therapeutic

(1 mark for enlisting and 1 mark for description)

Q.1.i Define pharmaceutical care and give its major function (2)

Patient care is defined as the responsible provision of drug therapy for the purpose of achieving definite therapeutic outcomes that improve the patient's quality of life.

Major functions:

1. Identifying potential and actual drug- related problems
2. Resolving actual drug-related problems
3. Preventing potential drug-related problems

(1 mark for definition and 1 marks for functions)

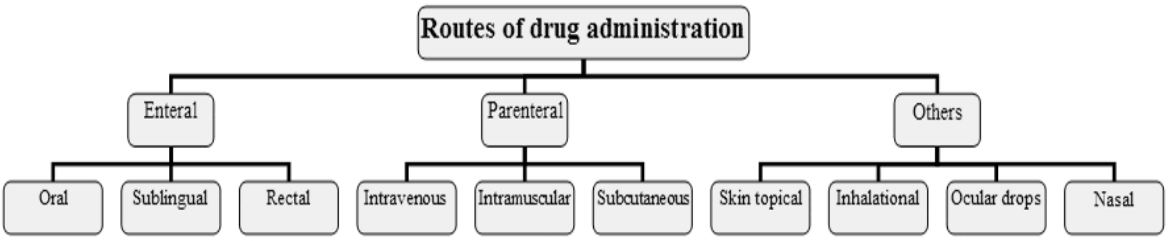
Q.1.j "OTC medications are safe but not risk free" Explain the statement. (2)

Risks involved in OTC medicine

1) Inaccurate diagnosis
2) Delay in obtaining needed therapy
3) Use of suboptimal therapy
4) Drug resistance
5) Increased costs to patients due to rampant use
6) Failure to follow label instructions
7) Perceived loss of control by physicians

(Any 4 points)

Q.2.a. Enlist the various routes of administration. Explain the oral route in detail (4)



Oral route: Giving a drug by mouth is the **most common** route of administration but it is also the **most variable**, and requires the **most complicated pathway** to the tissues. For the drug to get absorbed by the oral route it has to transit through various organs like stomach, small intestine, large intestine, liver etc which all can affect the absorption of drug.

Advantages:

1. Convenient - can be self- administered, pain free, easy to take
2. Absorption - takes place along the whole length of the GI tract
3. Cheap - compared to most other parenteral routes

Disadvantages:

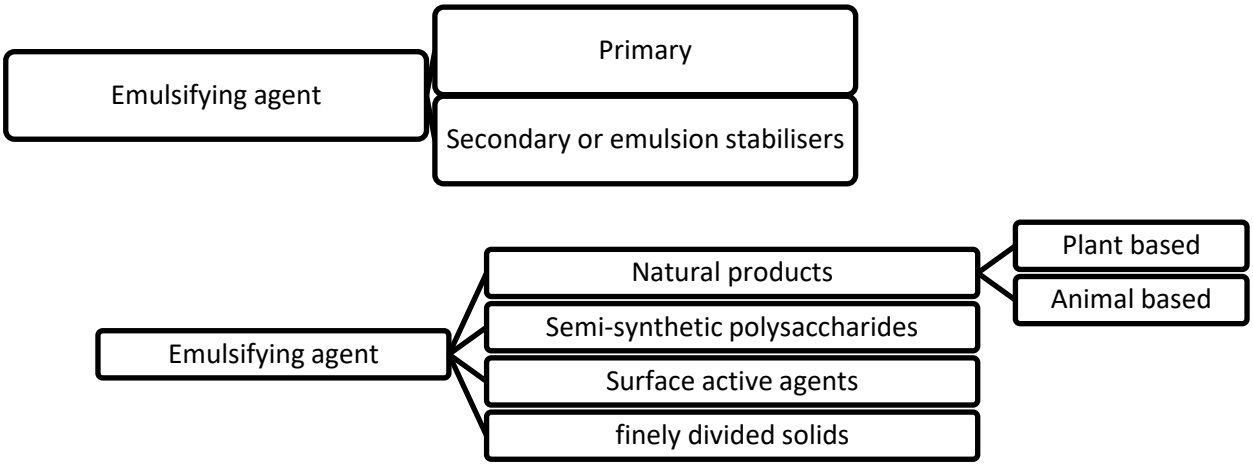
1. Sometimes inefficient - only part of the drug may be absorbed
2. First-pass effect - drugs absorbed orally are initially transported to the liver via the portal vein eg. Propranolol, lidocaine
3. Irritation to gastric mucosa - nausea and vomiting
4. Destruction of drugs by gastric acid and digestive juices eg. Penicillin, proteins and peptides
5. Effect too slow for emergencies
6. Unpleasant taste of some drugs
7. Unable to use in unconscious patient

Q.2.b Highlight the container – closure and labelling directions for (any 2) (4)

Sr. no.	Dosage form	Container-closure	Labelling directions
1	Pastilles	Wide mouth, coloured or colourless, glass or plastic container (eg. Jar or vial) or internally-lacquered or paper-lined aluminium container closed with internally lacquered or appropriately-lined screw cap or plastic cap (snap-on or plug-on type)	To be sucked slowly Do not drink water immediately after consumption
2	Suppository	Partitioned paperboard box, lined with waxed or suitably treated paper or plastic container.	For rectal use only To be unwrapped before insertion If appropriate: Dip in water just before insertion
3	Ointment	Wide mouth, screw capped; plain, squat pot of glass or suitable plastic or collapsible tube of metal or plastic. Pot is closed with screw cap with impermeable liner or very close-fitting slip-on lid	For external use only For eye ointment: Sterile

Q.2.c Classify emulsifying agents and explain polysaccharides as emulsifying agents (4)

Emulsifying agents may be classified as:



Polysaccharides:

Natural polysaccharides reduce surface tension by forming a multi-molecular layer at the o/w interface which acts as a barrier to coalescence. Only acacia and Irish moss can be regarded as primary emulsifiers, the rest are emulsion stabilisers.

They are all susceptible to hydrolysis and microbial attack, which may result in a loss of their emulsifying potential. An anti-microbial preservative is necessary for products intended to be stored for a long time.

Polysaccharides are precipitated by high concentration of alcohol and electrolytes. All of them except acacia significantly raise the viscosity of the continuous phase thus helping to reduce the rate of creaming in emulsion hence they are used as emulsion stabilisers.

Examples:

Acacia: Best emulsifying agents for emulsions for internal use.

- Attractive in appearance and quite palatable.
- Relatively stable over wide range of pH (2 to 10)
- Emulsions prepared from acacia have low viscosity therefore, creaming take place quite rapidly. Therefore, it is used with other emulsifying agents.
- Not too sticky for external use

Tragacanth:

- Rarely used alone because it produces coarse and thick emulsion. Therefore it is used along with acacia for preparing stable emulsion in the proportion of 1 part to 10 parts of acacia
- Appearance and stability of emulsion can be improved by passing the emulsion through a homogenizer.

Q3a. Highlight on different types of prescriptions. (4)

Definition - Prescription is an order from a physician, dentist or any other registered medical practitioner to a pharmacist for the supply of medicine, dressing or appliance for the patient.

1. Central Government Health Scheme prescription (CGHS):

- These prescriptions are for those who come under the health scheme of the govt
- These are not charged but levy charges may be taken.
- After dispensing the medicines, prescriptions are sent to the accounts section for pricing. The prescription bears common information and a column for pricing

2. Private prescription:

- Prescriptions are fully charged.
- These prescriptions are returned to the patients accept for drugs of controlled class.

3. Hospital prescription:

a. Inpatient prescription:

- Prescription for inpatients are written on the **physician's order form**.
- The physician order forms are prepared in multiple copies for utilization in the pharmacy, in the nursing station and to attach to the patient medication record.
- The Rx bears information regarding hospital name, ward number, period of stay, date and time of admission and discharge of patient.
- The Rx should provide space to note the time of drug administration and a column to keep record of change in therapy with the prescribers initials.
- After discharge of the patient, these preparations are filed with the patient medication records.
- Rx are fully charged or not charged depending on the provision of the health scheme.
- Medicines are prescribed for one week or 15 days.

b. Outpatient prescriptions:

- Format of Rx is the same as that of private Rx.
- These are charge or uncharged as per the health scheme.
- Usually medicines are supplied in quantity sufficient up till the next appointment.
- Record of Rx should be included in the patient's medical record.
- **Veterinary prescription:**
- The Rx written for an animal should state the type of animal, weight, breed and color along with name and detailed address of the owner.

Q3b. Describe in detail any two methods of preparation of suppository (4)

Any of the following methods can be explained

- Hand rolling
- Compression
- Moulding

OR

Write a short note on pastes

They are semisolid dispersion system, where large amount of solid particles (50%, e.g. ZnO) are dispersed in ointments – mostly oleaginous (Petrolatum).

Therefore they are stiffer than ointment

When applied they form a good protective barrier

They are good emollient as they prevent dehydration: because they are porous
They are good absorbent
They are less greasy then ointment
Bases used

- Hydrocarbon bases: Soft paraffin base

  Emulsifying ointment is the base for Resorcinol and Sulphur Paste BPC as it is used to treat dandruff and so must be easily removed from hair
  Magnesium Sulphate Paste (Morison's Paste) used to treat boils has glycerol as base

- Water miscible bases: emulsifying ointment base

  Soft paraffin is the base of Compound Zinc Paste BP and Compound Zinc and Salicylic Acid Paste (Lassar's Paste) BP which is used to treat psoriasis and eczema and other skin conditions
  Compound Aluminium Paste (Baltimore Paste) BPC has a base of liquid paraffin which is used as skin protectant

- Water soluble base: macrogol base
  Although no official examples are there macrogol is used for some pastes like water soluble dental pastes containing neomycin sulphate

Method of preparation – similar to ointment should be explained. An example of paste can be given

Q3c. Classify powders and explain powders for external use (4)

They may be prescribed in the form of Shaped & unshaped powders
Powders for internal use - Bulk powders for internal use like Granules or effervescent granules and Divided (i.e. single dose) powders
Bulk powders for external use like medical powders e.g. dusting powders and surgical powders and insufflations

Bulk powders for external use - Dusting powders

Dusting powders are mixtures of fine powders which are applied to the skin folds to prevent friction.
Dusting powders are of two types: Medical & Surgical

- **Medical:** They are used mainly for superficial skin conditions and sterility is rarely essential. medicated dusting powders must be free from pathogenic micro-organisms.
- Some mineral ingredients like Talc and kaolin may be contaminated with spores of tetanus, gas gangrene and antrax and therefore should be sterilized.
- Other constituents need not be sterilized
- Purified talc has good flow properties and is used in several BPC dusting powders
- Medical dusting powders are not intended for application to open wounds or areas of broken skin and should be labelled accordingly
- **Surgical:**
- Surgical dusting powders are used in body cavities and also on major wounds as a result of burns and umbilical cords of infants.
- Surgical dusting powders must be sterilized before their use.

- Hexachlorophane dusting powder contains an antibacterial agent and sterilized maize starch also known as absorbable dusting powder used as a lubricant to prevent chafing.

Q4a. How would you formulate a suspension containing an indiffusible solid (4)

- Indiffusible solids will not remain evenly distributed in a vehicle long enough to ensure uniformity of dose.
- E.g. Aspirin, Chalk, Calamine, Zinc oxide, Sulphadimidine, Phenobarbitone, Sulphur precipitated.
- Incorporation of thickening or suspending agent increases the viscosity of the vehicle which delays sedimentation by impending fall of particles under gravity and by obstructing particle collisions which lead to formation of aggregates that settles rapidly.
- The thickening agents used to stabilize suspensions are hydrophilic colloids, i.e. substances that spontaneously form colloidal dispersions with water because of an affinity between the dispersed particles & the dispersion medium.
- There are 3 major types of suspending agents:

a. Polysaccharides,
b. Inorganic salts &
c. Synthetic compounds

Give classification and explain atleast one suspending agent in each category

The thickening agents used to stabilize suspensions are hydrophilic colloids, i.e. substances that spontaneously form colloidal dispersions with water because of an affinity between the dispersed particles & the dispersion medium.
There are 3 major types:
Polysaccharides,
Inorganic salts &
Synthetic compounds

General method of preparation

1. Finely powder all the ingredients
2. Mix them in mortar and add compound tragacanth powder
3. Measure3/4th of the vehicle and triturate to form a smooth cream
4. Examine the suspension for foreign particles
5. Pour into a tared bottle
6. Rinse the mortar with small quantity of the vehicle
7. Transfer the rinsings to the bottle
8. Add any liquid ingredient
9. Add more of the vehicle to produce the required volume

Elaborate on the points and give an example of the suspension. Explain with one example

Q4b.
Comment on the following prescription
Rx
Arachis Oil 20ml
Double strength chloroform water 100ml
Water qs to 200ml
Make an emulsion – Send 50ml
Label: Three 5ml spoonful to be taken three times a day with meals

As done in the DP-CP practical with formula calculation along with emulsifying agents to be mentioned

Procedure – dry gum its steps to be explained and finally label to be drawn

Q4c. Elaborate on the role of community pharmacist in public healthcare system (4)
(Any 8 roles – 0.5 marks each)

1. Processing of prescription
2. Drug information about their action
3. Drug utilization
4. Drug distribution
5. Drug selection
6. Patient counselling and evaluating
7. Ensuring better healthcare
8. Nutrition Counselling
9. Women Welfare-Pregnancy and Infant Care
10. Rational Use of Drugs
11. Sexually Transmitted Diseases-AIDS
12. Alcohols, Drug Abuse and Smoking Cessation
13. Family Planning
14. Individualization of Drug Therapy
15. Extemporaneous preparation
16. Traditional and alternative medicines
17. Responding to symptoms of minor ailments
18. Domiciliary services

19. Agricultural and veterinary practice

20. Maintain records

Q.5 a) Define Health promotion and discuss methods for health promotion in society

Definition 1 mark
Methods 3 marks

Q.5 b) How does patient counselling impact therapeutic compliance

Discuss about any 4 points 4 marks

Q.5 c) write about code of ethics

Q. 6.a) Alligation square 1 mark
Solving to quantities 40.9 gms of 5% 3 marks
17.04 gms of 12%
17.04 ms of 20%

OR

235.29 l of 17% solution 4 marks

Q. 6 b) Treat it as a potent drug and show calculation for Dilutions, explain procedure of preparation and draw label 4 marks

Q. 6 c) Hepatitis: Causative agent and prevention 1 mark
AIDS: Causative agent and prevention 1 mark

Q.6.c.ii) What is a balanced diet? Give its significance (2)

A balanced diet is one that gives your body the nutrients it needs to function correctly

Its significance:

1. A balanced diet is important because your organs and tissues need proper nutrition to work effectively.
2. Without good nutrition, your body is more prone to disease, infection, fatigue, and poor performance.
3. Children with a poor diet run the risk of growth and developmental problems and poor academic performance.
4. Bad eating habits can persist for the rest of their lives.
   Rising levels of obesity and diabetes in India are prime examples of the effects of a poor diet and a lack of exercise.