UNIVERSITI KUALA LUMPUR
ROYAL COLLEGE OF MEDICINE PERAK

FINAL EXAMINATION
JULY 2025 SEMESTER

COURSE CODE	: RPD12703
COURSE NAME	: DOSAGE FORM DESIGN 1
PROGRAMME NAME	: DIPLOMA IN PHARMACY
DATE	: 18 SEPTEMBER 2025
TIME	: 2.00 PM – 4.00 PM
DURATION	: 2 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read CAREFULLY the instructions given in the question paper.
2. This question paper has information printed on both sides of the paper.
3. This question paper consists of TWO (2) sections; Section A and Section B.
4. Answer ALL questions in Section A and THREE (3) questions in section B.
5. Please mark/write your answers on the OMR answer script and answer booklet provided.
6. Answer all questions in English language ONLY.

THERE ARE 14 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A: MULTIPLE CHOICE QUESTIONS (Total: 25 marks)

INSTRUCTION: Answer ALL questions.

Please use the objective answer sheet provided.

1. What characteristic best describes a pharmaceutical solution?
   A. A solid dispersed in a liquid
   B. A uniform mixture of at least two substances
   C. A gas suspended in a liquid
   D. A combination of immiscible liquids

2. Which compound is typically added to inhibit oxidation in pharmaceutical solutions?
   A. Butylated hydroxyanisole
   B. Citric acid
   C. Glucose
   D. Calcium carbonate

3. Select the disadvantage of using synthetic flavouring agent.
   A. Constant composition
   B. Easily available
   C. Chemically stable
   D. Alteration of pH

4. Which practice would be most effective in promoting faster dissolution of a drug?
   A. Keeping the drug at room temperature
   B. Minimizing mechanical agitation
   C. Increasing surface area of particles
   D. Avoiding co-solvents

5. Which type of patient would benefit most from formulations without sweeteners and ethanol-based solvents?
   A. Children over 12 years old
   B. Patients recovering from minor infections
   C. Individuals with dietary restrictions due to chronic illness
   D. Elderly patients with mild pain

6. Identify the main disadvantage of using a multi-dose container for liquid preparations.
   A. Reduce patient compliance
   B. Risk of contamination
   C. Lower drug stability
   D. Decrease drug solubility

7. Which type of vehicle is best suited for a gargle preparation?
   A. Distilled water
   B. Flavored aqueous solution
   C. Vegetable oil
   D. Alcohol-based solution

8. Identify the buffering agent in nasal drops.
   A. Citric acid
   B. Sodium phosphate
   C. Ascorbic acid
   D. Sodium bicarbonate

9. What is an important precaution when using nasal drops?
   A. Tilt the head backward and breathe deeply
   B. Keep the head bent forward during administration
   C. Blow the nose immediately after instilling the drops
   D. Store the bottle in the freezer before each use

10. In topical liniment formulations, which ingredient is primarily used for its counterirritant effect?
   A. Methyl salicylate
   B. Propylene glycol
   C. Carboxymethyl cellulose
   D. Saccharin

11. Which of the following is appropriate as an antiseptic for otic solution?
    A. Chlorhexidine
    B. Phenol
    C. Menthol
    D. Glycerin

12. Which type of container is preferred for light sensitive active ingredient?
    A. Transparent plastic bottle
    B. Amber glass bottle
    C. Glass ointment jar
    D. Clear glass bottle

13. In liquid pharmaceutical preparations, what is the role of glycerine?
    A. Suspending agent
    B. Preservative
    C. Sweetening agent and solvent
    D. Buffering agent

14. The addition of which component in ear drops ensures a reduction in microbial growth?
    A. Benzalkonium chloride
    B. Menthol
    C. Distilled water
    D. Sodium chloride

15. A solution intended for nasal administration should have which of the following characteristics?
    A. High pH
    B. Low viscosity
    C. Iso-osmotic
    D. High alcohol content

16. Which liquid external preparation is used to relieve muscle soreness?
    A. Ointment
    B. Cream
    C. Liniment
    D. Suspension

17. What is the most common type of excipient used in liquid formulations to improve the taste?
    A. Propylene glycol
    B. Sodium chloride
    C. Sorbitol
    D. Hydroxypropyl methylcellulose

18. Which of the following is a key role of preservatives in pharmaceutical formulations?
    A. To prevent microbial contamination
    B. To enhance the absorption of the active ingredient
    C. To increase the viscosity of the formulation
    D. To improve the taste of the formulation

19. Identify the essential role of saccharin in the formula of oral pharmaceutical liquid preparation.
    A. To mask the bitter taste
    B. To improve appearance
    C. To make up the volume
    D. To extend the shelf life

20. What is the primary advantage of oral suspensions as a liquid dosage form?
    A. They are harder to produce compared to tablets
    B. They have higher bioavailability than injections
    C. They provide a stable solution for insoluble drugs
    D. They require refrigeration for stability

21. Which of the following additives is commonly included in oral suspensions to prevent microbial growth?

A. Potassium phosphate
B. Strong ginger tincture
C. Amaranth solution
D. Benzoic acid

22. What is the role of acacia in an emulsion?

A. To make the liquids more viscous
B. To adjust the pH of emulsion
C. To prevent the liquids from separating
D. To increase the shelf life of the emulsion

Question 23 to 25 requires the following answer.

A	B	C	D
I and III	II and IV	I, II and III	II, III and IV

23. Select the factors that affect the stability of an oral emulsion.

I Particle size of disperse phase

II Storage temperature

III Type of emulsifying agent

IV Choice of compounding apparatus

24. Identify natural emulsifying agent for oral emulsion.

I Bentonite

II Pectin

III Sorbitan esters

IV Tragacanth

25. Select the important factors when determining dose of paediatric oral drops.

I Medicine bioavailability

II Child's age

III Child's gender

IV Child's weight

SECTION B: MODIFIED ESSAY QUESTIONS (Total: 75 marks)

INSTRUCTION: This section consists of FOUR (4) modified essay questions (MEQ).
You are required to answer THREE (3) questions in the answer booklet provided.
Question 1 and Question 2 are COMPULSORY.
Answer either Question 3 OR Question 4.

Question 1

(a) State **THREE (3)** disadvantages of liquid dosage forms.

(3 marks)

(b) State **THREE (3)** factors to be considered in choosing a dosage form.

(3 marks)

(c) State the use of aromatic oils.
Give **ONE (1)** example.

(2 marks)

(d)

Explain **TWO (2)** differences between these two dosage forms.

(4 marks)

(e) Explain **TWO (2)** characteristics of liniments.

(2 marks)

(f) Identify **TWO (2)** suitable storage instructions for mouthwash preparation.

(2 marks)

(g) Strong Pholcodine Linctus

Pholcodine	2g
Citric acid monohydrate	20g
Amaranth solution	2ml
Compound tartrazine solution	20ml
Chloroform spirit	150ml
Syrup	to 1000ml

i. State the role of the following ingredients:

Pholcodine –

Citric acid monohydrate –

Chloroform spirit –

Syrup –

(4 marks)

ii. State the colour of the above linctus.

Explain your answer.

(3 marks)

iii. State an important advice for patients taking the above product.

(2 marks)

Question 2

For each of the following questions, you are required to show complete calculations.

(a) Suzy took her son to see a doctor after he complained of itching all over his body after he ate a plate of marinara seafood pasta. The doctor prescribes the following.

Rx

Fexofenadine Oral Suspension 45mg bd x 5/7

Based on the above product, answer the following questions.

i. Calculate the volume (mL) that Suzy should give to her son for each dose.

(1 mark)

ii. Calculate the total dose (g) her son will take throughout his treatment.

(2 marks)

(b)

Name : Paloma	Medical 6A-Pin.6/22 C CAS No. 30068636A
IC no. : 08-3342	Rx
MRN : 90011	Tab. Dexamethasone 4mg bd x 1/52 Then 4mg od x 4/7 Then 2mg od x 3/7 Then 1mg od x 1/52
Age : 50 years	
Date : current date	
Diagnosis :	Zulfikar Medical Officer UniKL RCMP
	UNIKL RCMP

Stock available: Tab. Dexamethasone 0.5mg

i. Calculate the number of tablets you should supply for each of the dosage regimen.

(4 marks)

ii. Calculate the total number of Tablet Dexamethasone you should supply for this patient.

(1 mark)

(c) The following is the information regarding Piperazine Hydrate.

> For the treatment of threadworm infections in an adult and in a child aged over 12 years, a daily dose equivalent to 2 grams of piperazine hydrate is given by mouth for one week. For a child aged from 7 to 12 years, the daily dose is 1.5 grams; for a child aged from 4 to 6 years, 1 gram; for a child aged from 2 to 3 years, 750 milligrams; and for a child aged from 9 to 24 months, 375 milligrams. The doses should preferably be divided and administered in 2 or 3 portions during the day. Re-infection should

Bernardo, 6, was prescribed Piperazine Elixir 800mg/4mL to treat his threadworm infection. The doctor instructed her father to give the elixir in two divided doses for five consecutive days.

i. Calculate the volume (mL) per dose for Bernardo according to the above prescription.

Determine whether the prescribed dose is suitable.

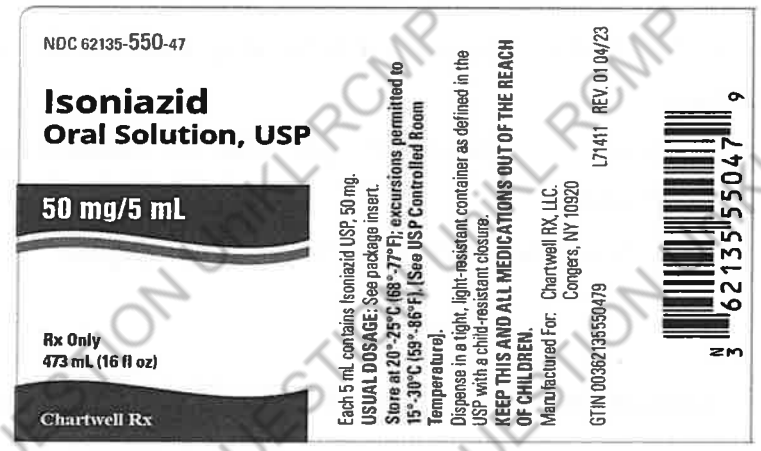
(3 marks)

ii. Calculate the total dose (g) for Bernardo throughout his treatment.

(2 marks)

(d)

Name : Carmelita	Medical 6A-Pin.6/22 C CAS No. 30068636A
IC no. : 08-3342	Rx
MRN : 90011	Isoniazid Oral Solution 10mg/kg bd x 12/7
Age : 12, BW: 25kg	
Date : current date	
Diagnosis :	Zulfikar Medical Officer UniKL RCMP
UNIKL RCMP	



i. Based on the above information, calculate the dose (mL) for Carmelita. Calculate the volume (mL) that Carmelita should take for each dose.

(3 marks)

ii. Calculate the daily dose (g) for Carmelita.

(2 marks)

iii. Calculate the total number of Tablet Isoniazid required if you need to compound the oral solution extemporaneously.
Available stock: Tab. Isoniazid 300mg

(2 marks)

(e) The following is the information regarding Naproxen Sodium.

Actions and uses. Naproxen is an analgesic with anti-inflammatory properties and has the actions and uses described under Ibuprofen but is more effective.
When given by mouth, naproxen is well absorbed and as it has a relatively long half-life it is effective when doses are given twice daily.
The usual dose for adults is 250 milligrams twice daily, the first dose being taken with the morning meal and the second dose 12 hours later. The dose may be increased to 375 to 750 milligrams daily according to the response.
The usual dose for children between the ages of 5 and 16 years is 5 milligrams per kilogram body-weight twice daily.

Anthony, 13, body weight 50kg, was prescribed with the above oral suspension. The physician prescribed as follows.

Rx

Naproxen Oral Suspension 280mg q12h/prn x 1/52

Based on the above information, calculate the following.

i. By showing a complete calculation, identify whether the prescribed dose is overdose or not overdose.

(3 marks)

ii. Based on answer in (e) i , calculate the appropriate volume (mL) Anthony should take for each dose.

(1 mark)

iii. Calculate the daily dose (mL) for Anthony.

(1 mark)

Question 3

(a) List **TWO (2)** criteria for selecting a colouring agent.

(2 marks)

(b) List **THREE (3)** important characteristics when selecting closures for liquid external preparations.

(3 marks)

(c) State **TWO (2)** types of enema based on their function and give **ONE (1)** example for each.

(4 marks)

(d) List **THREE (3)** vehicles used in otic preparations.

(3 marks)

(e) Suggest **TWO (2)** suitable packaging methods for nasal preparations.

(2 marks)

(f) Paediatric Drug D Suspension

Drug D	100g
Compound Tragacanth powder	10g
Amaranth solution	10ml
Benzoic Acid solution	20ml
Raspberry syrup	200ml
Chloroform water double strength	500ml
Water for preparation to	1000ml

i. Identify whether the above formula is suspension containing diffusible solid or suspension containing in-diffusible solid.
Explain your answer.

(3 marks)

ii. State the main apparatus that is essential for compounding the above suspension.
Explain your answer.

(2 marks)

(g) State the type of oil for Liquid Paraffin emulsion.

(1 mark)

(h) Liquid Paraffin Emulsion

Liquid Paraffin	50ml
Acacia	qs
Sodium benzoate	0.5g
Vanillin	0.05g
Chloroform	0.25ml
Purified water	to 100ml

Calculate the quantity of the acacia needed to compound 1.2L of the above product.

(5 marks)

Question 4

(a) Describe the role of suspending agent and give **ONE (1)** example.

(2 marks)

(b) State **THREE (3)** key considerations when storing liniments.

(3 marks)

(c) List **TWO (2)** liniment bases.

(2 marks)

(d) State main function of gargle.

(1 mark)

(e) List **TWO (2)** examples of mouth paint and their indication.

(4 marks)

(f)

Based on the picture above, describe **TWO (2)** proper techniques to administer the medication.

(2 marks)

(g) Compound Magnesium Trisilicate Mixture

Magnesium Tricilicate	50g
Light magnesium carbonate	50g
Sodium bicarbonate	50g
Peppermint emulsion	25ml
Chloroform water, double strength	500ml
Water for preparation to	1000ml

Identify whether the above formula is suspension containing diffusible solid or suspension containing in-diffusible solid.
Justify your answer.

(2 marks)

(h) Olive oil Emulsion

Olive oil	40ml
Acacia	qs
Chloroform water	to 200ml

Calculate the quantity of the ingredients needed to compound 90z of the above product.

(5 marks)

(i) Briefly explain Continental method in compounding the above emulsion.

(4 marks)

END OF EXAMINATION PAPER