UNIVERSITI KUALA LUMPUR
ROYAL COLLEGE OF MEDICINE PERAK

FINAL EXAMINATION
JULY SEMESTER 2025

COURSE CODE	: RPB13032
COURSE NAME	: INTRODUCTION TO PHARMACEUTICS
PROGRAMME NAME	: BACHELOR OF PHARMACY WITH HONOURS
DATE	: 18 SEPTEMBER 2025
TIME	: 9.00 AM – 11.00 AM
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. For Section B, answer THREE (3) questions WITH AT LEAST ONE (1) question from question 3 or question 4.
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 11 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 40 marks)

I) MULTIPLE CHOICE QUESTIONS (20 marks)

INSTRUCTION: Answer ALL questions.

Use the OMR sheet provided.

1. Identify the father of medicine.
   A. Aesculapius
   B. Galen
   C. Hippocrates
   D. Dioscorides
   E. Paracelsus

2. In the 19th century, the term druggist referred to a _____.
   A. physician
   B. pharmacist
   C. technologist
   D. paramedics
   E. medical practitioner

3. Identify the physician who discovered antibiotics and the treatment for syphilis.
   A. Edward Jenner
   B. Ehrlich
   C. Friedrich Serturner
   D. William Withering
   E. Geber

4. State the first general anesthesia in the 1840s.
   A. Midazolam
   B. Fentanyl
   C. Chloroform
   D. Sevoflurane
   E. Propofol

5. Identify the type of plastic that can tolerate sterilization by steam.
   A. Polyvinyl chloride
   B. Polypropylene
   C. Polyethylene
   D. Thermosetting
   E. Thermoplastics

6. Which type of closure creates a hermetic seal?
   A. Fused glass ampoule
   B. Paper-based lid
   C. Plastic snap cap
   D. Wax lining
   E. Rubber bung with overseal

7. Name the type of glass used for parenteral products due to its high chemical resistance and low thermal expansion.
   A. Type I borosilicate glass
   B. Type IV borosilicate glass
   C. Type III glass
   D. General-purpose soda-lime glass
   E. Treated soda-lime glass

8. Distinguish the role of wax linings in metal packaging.
   A. Protect against mechanical damage.
   B. Provide insulation against heat.
   C. Enhance visual appeal.
   D. Ensure compatibility with water-based products.
   E. Increase compatibility with alkaline materials.

9. Select limitation of thermoplastics which may compromise their effectiveness in pharmaceutical packaging.

A. Poor moldability in thin-walled containers.
B. Tendency to soften at elevated temperatures.
C. Inability to withstand repeated heating.
D. Weak resistance to ultraviolet radiation.
E. High production costs.

10. What process is used to produce Type II treated soda-lime glass to enhance its resistance to water?

A. Coating with hydrophobic polymers.
B. Heating to 200 °C followed by cooling.
C. Annealing the glass at high temperatures.
D. Sulfating with ammonium sulfate or chloride gases.
E. Application of boron oxide to the surface.

11. Indicate the primary component used in the production of glass containers.

A. Silicon carbide
B. Silicon dioxide
C. Magnesium carbonate
D. Aluminium oxide
E. Graphite

12. Type II treated soda-lime glass is unsuitable for _____.

A. neutral solutions
B. blood products
C. buffered solutions below pH 7
D. acidic solutions
E. slightly alkaline solutions

13. Specify the additive in plastic that minimizes airborne dust accumulation.
    A. Fillers
    B. Antioxidants
    C. Antistatic
    D. Surfactant
    E. Plasticizers

14. Identify the chemically inert metal most commonly used for collapsible tubes.
    A. Stainless steel
    B. Lead
    C. Copper
    D. Aluminium
    E. Tin

15. Why is the dealkalization process critical for treated soda-lime glass?
    A. Reduce leaching of alkali ions.
    B. Enable compatibility with highly alkaline solutions.
    C. Allow flexibility in molding processes.
    D. Improve optical clarity for diagnostic use.
    E. Ensure suitability for blood products.

16. Indicate one of the features that makes regenerated cellulose films ideal for secondary packaging.
    A. Inertness to most chemicals.
    B. Excellent gas permeability.
    C. Transparency and flexibility.
    D. Robustness for bulk transportation.
    E. Resistance to high temperatures.

17. What is the key limitation of paper as a packaging material?

A. Low cost
B. Robustness
C. High impact resistance
D. Suitable as a primary container
E. Apparent damage

18. Select the purpose of adding arsenic trioxide during glass production.

A. Reduce surface permeability.
B. Increase chemical inertness.
C. Minimize blisters in the glass.
D. Improve resistance to impact.
E. Increase optical clarity.

19. Indicate the prominent feature of aluminium as a packaging material.

A. Light weight and low cost.
B. High weight and cost.
C. High reactivity with acidic products.
D. Poor thermal stability.
E. Compatibility with all pharmaceuticals.

20. Select the type of bottle typically used for high-viscosity liquids.

A. Wide-mouthed
B. Colored fluted
C. Dropper
D. Round vials
E. Narrow-mouthed

II) SHORT ANSWER QUESTIONS (20 marks)

INSTRUCTION: Answer ALL questions in the answer booklet provided.

Each question carries TWO (2) marks.

1. Describe the pharmacopeia.

2. Explain the significance of the British Pharmaceutical Codex (BPC).

3. Differentiate between superscription and inscription.

4. Explain the potential risks linked to extemporaneous prescriptions in contrast to pre-compounded prescriptions.

5. List **FOUR (4)** steps in the dispensing process.

6. Discuss the procedures for handling prescriptions that require clarification.

7. Provide measures to be taken during compounding.

8. Give **FOUR (4)** sources of errors in prescription.

9. An injection solution contains 90,000 units of an antibiotic for each milliliter. Every 1500 units is equivalent to 1 mg of the drug. Calculate the amount of the drug (in milligrams (mg)) available in 1 mL of the solution.

10. The strength of preparation as stated on the label is 1:1250. Convert the strength into percentage.

SECTION B: MODIFIED ESSAY QUESTIONS (Total: 60 marks)

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

Question 1

(a) By using allegation method, calculate how many milliliters of 10% elixir A and 50% elixir B must be combined to produce 800 milliliters of 30% elixir.

(10 marks)

(b) What is the density of 625 mL of a solution which weighs 500 g?

(2 marks)

(c) You are required to prepare a 120 mL of chlorhexidine solution from a 10% stock solution. A 30 mL portion of this chlorhexidine solution is then diluted with distilled water up to 1500 mL, resulting in a strength of solution 1:5000.

i. Calculate the strength in percentage of the chlorhexidine solution that needs to be prepared.

(4 marks)

ii. Based on c (i), calculate the volume of 10% stock solution required to prepare 120 mL of chlorhexidine solution.

(4 marks)

Question 2

(a) By using Clark's Rule, calculate the doxycycline dose for a child weighing 30 kg given that the adult dose is 250 mg.

(2 marks)

(b) Discuss **FIVE (5)** factors affecting the dose of a drug.

(10 marks)

(c) Below is the prescription prescribed for upper respiratory tract infection (URTI)

Name: Mr. Sanjeet	R_x **BW** 299100
ID number: 94123-91-5421	*T. Ciprofloxacin 500 mg b.d. × 5/7*
Registration number: 1431	*T. Paracetamol 500 mg t.d.s. / prn × 3/7*
Age: 31	*T. Pseudoephedrine 60 mg q.i.d / prn x 3/7*
Date: 21/4/2024	*Dr. XYZ* MBBS, MRCP (UK) *Klinik Berjaya Ipoh, No. 3, Jalan Greentown 30350, Ipoh* *Tel: 05-211 1454* ..... (Signature & Stamp)
Diagnosis: URTI	

i. Based on the prescription, calculate the dose and the number of tablets for all medications that Mr. Sanjeet needs to take for the entire course.
(Given available dose for ciprofloxacin is 250 mg, other medication dose is available as per prescription)

(6 marks)

ii. Upon dispensing the medication, Mr. Sanjeet mentioned that he has symptoms, difficulty swallowing T. Paracetamol because due to their bitterness. You reconfirmed with the healthcare provider, who decided to switch him from the tablet form to an oral solution. Calculate the appropriate dose and determine the number of bottles to be dispensed.
(Given that the available strength of the oral solution is 250 mg / 5 mL per bottle of 100 mL)

(2 marks)

Question 3

(a) A 3-year-old child weighing 9.6 kg needs to take syrup paracetamol, which is available as a 250 mg/5 mL oral solution. Calculate the volume of the solution required, given that the dose is 15 mg / kg.

(3 marks)

(b) Explain physical incompatibility.

(2 marks)

(c) Distinguish between potentiation and antagonistic interactions with relevant examples.

(4 marks)

(d) The following is the formula used to prepare a mixture.

Strychnine hydrochloride solution	5 mL
Aromatic spirit of ammonia	3 mL
Purified water	to 100 mL

i. Predict the type and reason of such incompatibility.

(3 marks)

ii. With respect to d (i), it suggests preventive measures for the observed incompatibility.

(4 marks)

(e) Explain **THREE (3)** factors leading to immiscibility.

(4 marks)

Question 4

(a) A 2-year-old child weighing 12.4 kg has been prescribed syrup clarithromycin, which comes as a 125 mg / 5 mL oral solution. Calculate the volume of the solution required, given that the dose is 7.5 mg / kg.

(3 marks)

(b) Give preventive measures for acid–base reactions involving pH that cause color change.

(2 marks)

(c) Provide **FIVE (5)** manifestations of physical incompatibility.

(5 marks)

(d) The following is the composition present in spray solution.

Sodium bicarbonate	1.5 g
Borax	1.5 g
Phenol	0.75 g
Glycerin	25 mL
Water	to 100 mL

Predict the possible outcome with its preventive measures.

(5 marks)

(e) Describe causes for chemical incompatibility involving oxidation.

(5 marks)

END OF EXAMINATION PAPER