Pharmacy and Poisons Board of Hong Kong

Sample Examination Paper (3 hours)

Pharmacy Practice

READ THESE INSTRUCTIONS CAREFULLY
DO NOT TURN THIS PAGE OVER UNTIL YOU ARE TOLD TO DO SO

FAILURE TO COMPLY WITH THE INSTRUCTIONS MAY RESULT IN DEDUCTION IN MARKS OR DISQUALIFICATION

1.   *Write your Candidate Number clearly on each answer sheet.   Do not write your name on any sheet.*

2.   *USE "ANSWER SHEET FOR MULTIPLE-CHOICE QUESTIONS" FOR __PART I__ QUESTIONS.   THE ANSWER SHEET WILL BE COLLECTED SEPARATELY AT THE END OF EXAMINATION.*

3.   *USE A FRESH SHEET FOR __EACH__ ESSAY QUESTION OF __PART II__ QUESTIONS.   THE ANSWER TO EACH QUESTION WILL BE COLLECTED SEPARATELY AT THE END OF EXAMINATION.*

4.   *Read the questions very carefully.   Do not waste time writing down information that is not asked for.   No marks will be given for irrelevant answers.*

5.   *Answer __ALL__ questions.*

6.   ***Do not take any question papers or writing papers, whether used or unused, out of the examination room.***

This paper consists of this page and **FOUR** other printed pages.

PART I – MULITPLE-CHOICE QUESTIONS

*Total **40** questions, **0.5** mark for each correct answer.*
*Answer **ALL** questions.*

No sample will be provided

PART II – ESSAY QUESTIONS

1. a) A pharmacist has to provide a litre of approximately 50 mmol/L of Na^+ for use as an emergency oral rehydration therapy. The only available source of Na^+ is a 1-L infusion bottle of 0.9% sodium chloride. What volume of the infusion fluid should be made up to 1L with purified water to provide the correct concentration of Na+?
    (Na = 23, Cl = 35.5)   (3 marks)

    b) An 80-kg man requires an infusion of drug Y at a dose of 0.2 micrograms/kg/minute. The drug is available in a 1-mL ampoule containing 5 mg/mL. Calculate the dose per minute and the final volume of the infusion solution, assuming it will be delivered at 1mL/minute.   (3 marks)

    c) A solution for use as an eye drop is to contain 0.4g of ephedrine sulphate and 1g of tetracycline hydrochloride per 100ml. How many grams of sodium chloride must each 100ml of the solution contain if it is to be isoosmotic with tears?
    Sodium chloride equivalent of ephedrine sulphate is 0.23; that of tetracycline hydrochloride is 0.14.   (3 marks)

    Freezing point depression of 1% solution of ephedrine sulphate is 0.165; that of tetracycline hydrochloride is 0.081.

    d) A solution of sodium chloride contains 77mmol. Calculate its osmolar strength in terms of milliosmoles per litre.
    Assume complete dissociation.
    (Na = 23, Cl = 35.5)   (2 marks)

    e) An 8-kg child is prescribed alfacalcidol at the recommended dosage (50 nanograms/kg daily). One-Alpha oral drops contain 100 nanograms of alfacalcidol per drop. Assuming one dose per day, how much alfacalcidol (in milligrams) will the child be given in 2 weeks and what volume (in terms of number of drops) of One-Alpha is required if 1mL contains 2 micrograms?   (3 marks)

f) Calculate the quantities required to produce 50 pessaries to the following formulas: (3 marks)

Metronidazole   400mg

Pessary base sufficient to produce a 2-g pessary

Assume the pessary base has the same characteristics as theobroma oil and the displacement value for metronidazole is 1.7.

g) A 70-kg volunteer is given an intravenous dose of an antibiotic, and serum concentrations were determined at 2 and 5 hr after administration. The concentrations were 1.2 and 0.3 μg/mL, respectively. What is the biologic half-life for this drug, assuming first-order elimination kinetics? (3 marks)

2. Briefly discuss the followings for a patient with type 2 diabetes:

a) HbA1c target, healthy lifestyle advices, and symptoms and management of hypoglycaemia (6 marks)

b) Treatment with sulphonylureas, thiazolidinediones and dipeptidyl peptidase (DPP)-4 inhibitors (9 marks)

3. You are a community pharmacist. A 25-year-old male comes to your pharmacy with the complaint of frequent sneezing and nasal congestion. On questioning, you find out that he has history of allergic rhinitis. He has been using a decongestant nasal spray for a few weeks but his symptoms do not improve.

a) What questions you need to ask before making recommendation to this patient? (5 marks)

b) What treatments (including non-pharmacological and pharmacological) would you recommend for management of allergic rhinitis? (10 marks)

4. You are a pharmacist working in an outpatient pharmacy and you are being approached by a male patient who is trying to get his refills on the following oral medications.

    Metoprolol 50 mg twice daily
    Aspirin 325 mg daily
    Benazepril 40 mg daily
    Isosorbide dinitrate 20 mg every 6 hours

    New prescription: Nitroglycerin sublingual tablets as needed for chest pain

    a) What is the mechanism of action for nitrate tolerance and how it should be prevented?   Are all nitrates capable of inducing nitrate tolerance? (7 marks)

    b) Please provide patient counselling on his new medication. (8 marks)

5. Before an administered drug can arrive at its site of action in effective concentrations, it must surmount a number of barriers.   These barriers are chiefly a succession of biologic membranes such as those of the gastrointestinal epithelium, lungs, blood, and brain.   In most instances a drug substance must pass more than one of these membrane types before it reaches its site of action.

    a) Please describe the general pathways for a drug to penetrate through the biological membranes. (5 marks)

    b) Absorption of solid drug products (e.g., tablets) can occur only after the drug substance is in solution. Please comment on the relationship between drug dissolution and absorption and how it will affect the overall bioavailability of a drug product. (10 marks)

END OF PAPER