



The Pharmacy Examining Board of Canada

Le Bureau des examinateurs en pharmacie du Canada

Pharmacist Evaluating Examination Sample Questions

The following sample questions are **NOT** intended or designed to be a sample exam, and do **NOT** represent an exact model of the Pharmacist Evaluating Examination in terms of difficulty and proportion of topics. However, individually, these questions are intended to be representative, in **format and phrasing style**, of the types of questions found on the Pharmacist Evaluating Examination. They also illustrate a variety of the subject areas contained in the examination blueprint. Most questions have **five** options with one best answer; some have **four** options with one best answer.

Please note that, although these questions are reviewed and updated annually to ensure currency of content, if guidelines or legislation change in the interim, the answers may not be accurate.

Please see below for the [ANSWERS](#) to these sample questions.

PHARMACEUTICAL SCIENCES

1. Imatinib is an anticancer agent used in the treatment of chronic myelogenous leukemia that acts by inhibiting the activity of:
 - a. tyrosine kinase of Bcr-Abl.
 - b. tyrosine kinase of HER-2.
 - c. tyrosine kinase of FGFR.
 - d. histone deacetylases.
 - e. serine/threonine kinase mTOR.
2. Which of the following nonparenteral routes of administration yields the best bioavailability of biotechnology protein drugs?
 - a. Oral
 - b. Rectal
 - c. Pulmonary
 - d. Transdermal
3. Which of the following drugs is an antagonist at the central presynaptic α_2 -adrenergic receptors?
 - a. Clonidine
 - b. Terazosin
 - c. Mirtazapine
 - d. Risperidone
 - e. Venlafaxine

4. A monoclonal antibody was tested in patients using the following dose ranges and resulted in the following $t_{1/2}$ values:

<u>Dose</u>	<u>Half-life</u>
0.2 mg/kg	2 days
1 mg/kg	8 days
2 mg/kg	18 days
3 mg/kg	18 days
5 mg/kg	18 days

What is the reason for the dose-dependent $t_{1/2}$? The biologic drug:

- a. eliminates primarily by the lymphatic system at lower doses.
 - b. eliminates primarily by the liver resulting in nonlinear pharmacokinetics.
 - c. eliminates by catabolism.
 - d. distributes rapidly to peripheral organs at lower doses.
 - e. exhibits target-mediated drug disposition.
5. In tablets made from wet granulation processing, which of the following substances is commonly included as a lubricant?
- a. Lactose
 - b. Potato starch
 - c. Croscarmellose
 - d. Dicalcium phosphate
 - e. Sodium lauryl sulfate
6. For membrane-controlled, oral drug delivery systems, which of the following parameters is the initial determinant of drug dissolution from the drug core? The amount of:
- a. active ingredient.
 - b. disintegrant.
 - c. water getting in.
 - d. lubricant.
7. Which of the following statements is correct about the use of antioxidants in parenteral products?
- a. Antioxidants are most effective when used in a parenteral product with a neutral pH.
 - b. Propylparaben is commonly used as an antioxidant.
 - c. Antioxidants are added to parenteral products to increase reduction reactions.
 - d. Antioxidants are effective because they are less chemically stable than the active ingredient.
 - e. Antioxidants are not effective in injectable emulsions.

8. Drug X was administered by subcutaneous (SC), intramuscular (IM), intravenous (IV), and oral (PO) routes to healthy volunteers at various doses. Serial plasma samples were collected to characterize the pharmacokinetics of Drug X. The plasma concentrations of Drug X were measured and the area under the concentration-time profile (AUC) was assessed. The AUC information for each formulation is shown in the Table below:

Route	Dose (mg)	AUC (mcg*h/mL)
SC	10	160
IM	25	375
IV	5	100
PO	20	300

Which extravascular formulation has the best absolute bioavailability?

- a. SC formulation
 - b. IM formulation
 - c. IV formulation
 - d. PO formulation
 - e. All extravascular formulations have equal bioavailability
9. Given the following pharmacokinetic parameters for two formulations of the same drug, which of the following is correct regarding Formulation 2?

	<u>Formulation 1</u>	<u>Formulation 2</u>
Dose (mg)	100	200
AUC (mg*h/L)	150	300
C _{max} (mg/L)	50	50
T _{max} (h)	1	6

- a. It undergoes significant first-pass metabolism.
 - b. It has a higher clearance than Formulation 1.
 - c. It has a greater volume of distribution than Formulation 1.
 - d. It is a sustained-release product.
 - e. It is more bioavailable than Formulation 1.
10. Which of the following agents is a cholinesterase inhibitor indicated for the treatment of Alzheimer disease?
- a. Pregabalin
 - b. Duloxetine
 - c. Mirtazapine
 - d. Galantamine
11. Calcitonin acts by:
- a. decreasing intestinal calcium absorption.
 - b. increasing the effect of aldosterone.
 - c. increasing osteoclast bone resorption.
 - d. increasing the release of parathyroid hormone.
 - e. preventing procalcitonin cleavage.

- 12.** An accidental ingestion of hydrochloric acid is treated by the oral administration of:
- a. water.
 - b. sodium chloride.
 - c. magnesium hydroxide.
 - d. bismuth subsalicylate.
 - e. calcium carbonate.

PHARMACY PRACTICE

- 13.** Which of the following is the most appropriate recommendation for calcium supplementation for a 70 year old postmenopausal female who gets approximately 250 mg of elemental calcium daily from dietary sources?
- a. Calcium citrate 300 mg po bid
 - b. Calcium citrate 1000 mg po bid
 - c. Calcium carbonate 1250 mg po bid
 - d. Calcium carbonate 1500 mg po daily
- 14.** Which of the following is correct regarding asthma?
- a. Age of onset is usually greater than 40 year old.
 - b. There is no direct association between allergies and asthma.
 - c. Production of thick, coloured sputum often occurs with an asthma exacerbation.
 - d. Daytime symptoms less than three times per week indicates satisfactory control.
 - e. The course of disease is progressive, worsening with time.
- 15.** Which of the following natural products may be useful for osteoarthritis of the knee?
- a. Feverfew
 - b. St. John's wort
 - c. Evening primrose oil
 - d. Ginkgo biloba
 - e. Hyaluronic acid
- 16.** A 57 year old female has been receiving oxycodone for the past three months for severe, chronic back pain that remains only partially controlled. Which of the following statements is correct regarding opioid tolerance in this patient?
- a. For adequate pain management, this patient will likely require increasing opioid doses over time.
 - b. This patient would likely benefit from switching to methadone for pain management.
 - c. If this patient becomes tolerant to one opioid, she will have equal cross-tolerance to other opioids.
 - d. Switching from oxycodone to equivalent doses of another opioid would likely improve pain control.
 - e. Addition of an analgesic adjuvant such as gabapentin will permit tapering and discontinuation of the oxycodone.

- 17.** A 72 year old male is receiving treatment for prostate cancer. After two weeks of drug therapy, he complains to the pharmacist of bothersome hot flashes. The medication most likely to be causing this effect is:
- bicalutamide.
 - tamsulosin.
 - prednisone.
 - tamoxifen.
 - sildenafil.
- 18.** Which of the following statements is correct regarding the use of fluoroquinolones?
- Fluoroquinolones can cause blood glucose alterations in elderly patients who take oral antihyperglycemic medications.
 - Healthy women with acute uncomplicated cystitis should be treated for a minimum of seven days with a fluoroquinolone.
 - Therapeutic drug monitoring is recommended with prolonged fluoroquinolone therapy, to avoid ototoxicity.
 - In the case of treatment failure, another fluoroquinolone should be tried before switching to a different antibiotic class.
 - All fluoroquinolones have equal efficacy when used to treat patients with community-acquired pneumonia.
- 19.** Which of the following oral antifungal agents is the most likely to cause hepatotoxicity?
- Fluconazole
 - Nystatin
 - Ketoconazole
 - Terbinafine
 - Itraconazole
- 20.** A community pharmacist conducts a medication review for a 67 year old patient who has a 20-year history of COPD, diabetes and depression. The patient's current medications include the following:
- Acclidinium 400 mcg inhaler, one inhalation bid
 - Budesonide 200 mcg/formoterol 6 mcg Turbuhaler®, 2 inhalations bid
 - Salbutamol 100 mcg MDI, 2 inhalations qid
 - Sitagliptin 100 mg, one tablet po daily
 - Metformin 500 mg, one tablet po tid
 - Venlafaxine ER 150 mg, one capsule po at bedtime
- Which of the following drug therapy problems should be identified for this patient?
- Taking too high a dosage of acclidinium
 - Taking too high a dosage of metformin
 - Inappropriate dosing time for venlafaxine
 - Drug interaction between sitagliptin and metformin
 - Duplication of therapy with salbutamol and formoterol

- 21.** Which of the following would be the most appropriate treatment for moderate to severe atopic dermatitis in an 8 year old child?
- Urea 20% cream
 - Tacrolimus 0.03% ointment
 - Pimecrolimus 1% cream
 - Betamethasone dipropionate 0.05% ointment
 - Clobetasone propionate 0.05% cream
- 22.** Tadalafil is preferred over sildenafil in which of the following patient situations?
- After using sublingual nitroglycerin
 - After eating a high-fat meal
 - If receiving hemodialysis
 - If taking testosterone supplementation
 - For males over the age of 60 years
- 23.** An appropriate empiric treatment for community-acquired pneumonia (CAP) in a previously healthy adult patient would be:
- amoxicillin.
 - ciprofloxacin.
 - nitrofurantoin.
 - metronidazole.
- 24.** Which of the following medications is known to lower the esophageal sphincter pressure and possibly exacerbate gastroesophageal reflux disease?
- Enalapril
 - Nifedipine
 - Naproxen
 - Potassium chloride
 - Ferrous gluconate
- 25.** Rx Timolol 0.25 % drops
Mitte : 15 mL
Sig: gtt. i o.d. bid
On the prescription label the instructions to the patient should read:
- apply one drop into both eyes twice daily.
 - instill one drop into the left eye twice daily.
 - instill one drop into the right eye twice daily.
 - shake well and instill one drop into the left eye twice daily.
 - shake well and instill one drop into the right ear twice daily.

26. The recommended pediatric dosage for azithromycin therapy is 12 mg/kg po once daily on Days 1 through 5. For a child weighing 8.3 kg, calculate the total volume needed for the total course of treatment, if a product supplying 200 mg/5 mL is supplied for this order.
- 12.5 mL
 - 15 mL
 - 25 mL
 - 37.5 mL
 - 50 mL
27. Which of the following is a significant barrier perceived by physicians, that impedes effective pharmacist-physician collaboration in the provision of patient care?
- Provision of patient-specific counselling by pharmacists
 - Lack of adequate education and training of pharmacists
 - Lack of pharmacist follow up in assessing patient outcomes
 - Increased patient demands for more frequent medical appointments
 - Interruption of physician workflow due to pharmacist communications
28. Which of the following drug orders is incomplete and requires follow-up with the prescriber?
- Zithromax® (azithromycin 250 mg), 2 tabs po on day 1 and 1 tab po on days 2-5.
 - Flonase® (fluticasone) 50 mcg spray, 1 or 2 sprays in each nostril bid x 1 bottle
 - Actonel® (risedronate), 35 mg po once weekly x 12 tabs
 - Cozaar® (losartan), 50 mg po bid x 1 month
 - Zocor® (simvastatin), 1 tab po hs for 3 months
29. Which of the following foodborne pathogens causes gastrointestinal illness within a few hours after ingestion?
- Escherichia coli
 - Campylobacter jejuni
 - Clostridioides difficile
 - Staphylococcus aureus
 - Giardia lamblia
30. Which of the following laboratory parameters is most critical to monitor in a patient with cholecystitis?
- BUN
 - WBC
 - ALP
 - Lipase
31. Which of the following medications is associated with gynecomastia?
- Tamsulosin
 - Prednisone
 - Aripiprazole
 - Vardenafil
 - Finasteride

- 32.** The role of spironolactone in gender-affirming feminizing hormone therapy is as:
- an anti-androgen.
 - a potassium-sparing diuretic.
 - an antihypertensive.
 - a heart failure preventive.
 - an estrogen analogue.
- 33.** When comparing chlorthalidone to hydrochlorothiazide at equipotent doses, it is expected that a patient receiving chlorthalidone will experience:
- cardiovascular risk reduction that is independent of improved blood pressure control.
 - decreased risk of electrolyte disturbances, like hypokalemia and hyponatremia.
 - decreased incidence of glycemic and lipid disturbances.
 - increased risk of dermatologic reactions, like rash and photosensitivity.
 - improved blood pressure control.
- 34.** LP is a 25 year old male, diagnosed with asthma six months ago. He is currently maintained on inhaled budesonide 200 mcg/formoterol 6 mcg bid. When refilling his prescription, he complains to the pharmacist of having white plaques on his tongue. Which of the following is the most appropriate recommendation to LP's physician?
- Prescribe an antifungal agent
 - Prescribe an antibiotic agent
 - Reduce budesonide dose by one-half
 - Switch to inhaled salbutamol
 - Switch to inhaled fluticasone
- 35.** A prescription reads: "Take one tablet po qid for five days, then one tablet po tid for four days, then one tablet po bid for three days, then one tablet po once daily for two days."
How many tablets should be dispensed?
- 10
 - 20
 - 30
 - 40
 - 50
- 36.** SF has been prescribed risedronate 35 mg po once weekly. Appropriate counselling information for the pharmacist to provide to SF includes which of the following?
- Ingestion of calcium-containing foods should be avoided on the day when risedronate is taken.
 - A supplement containing vitamin D 10,000 units should be taken on the same day as risedronate.
 - After taking risedronate, it is important to remain sitting upright for at least 30 minutes.
 - Risedronate should be taken with a high fat meal to optimize absorption.
 - After taking risedronate, it is important to thoroughly rinse the mouth with water to avoid dental problems.

QUESTIONS 37 and 38 REFER TO THE FOLLOWING:

ND is a 56 year old, 68 kg female, who has recently been diagnosed with type 2 diabetes mellitus. After a complete work-up, the following problems have been identified: uncontrolled diabetes; diabetic nephropathy (creatinine clearance 15 mL/min); and hypertension.

- 37.** Which of the following is the most appropriate treatment option for ND?
- a. Metformin
 - b. Canagliflozin
 - c. Liraglutide
 - d. Glyburide
- 38.** ND is started on appropriate therapy for her diabetes. After one month, which of the following is most appropriate for monitoring ND's new diabetes therapy?
- a. Lipid profile
 - b. 24-hour urine collection
 - c. Glycosylated hemoglobin
 - d. Fasting blood glucose
 - e. Albumin-creatinine ratio

QUESTIONS 39 and 40 REFER TO THE FOLLOWING:

QB, a 72 year old male, presents to the pharmacy with a new prescription for vancomycin 250 mg po qid for 10 days for treatment of an infection.

- 39.** QB's infection is mostly likely caused by which of the following organisms?
- a. Viridans streptococci
 - b. Staphylococcus aureus
 - c. Pseudomonas aeruginosa
 - d. Escherichia coli
 - e. Clostridioides difficile
- 40.** QB experienced "vancomycin flushing syndrome" after receiving intravenous vancomycin two years ago for a bloodstream infection. What is the most appropriate course of action for the pharmacist?
- a. Dispense the vancomycin
 - b. Dispense the vancomycin and advise QB to pre-medicate with diphenhydramine
 - c. Dispense the vancomycin and advise QB to take the first dose while being observed at the pharmacy
 - d. Do not dispense the vancomycin and contact the prescriber to discuss an alternative
 - e. Do not dispense the vancomycin and contact the prescriber to discuss allergy testing for QB

BEHAVIOURAL, SOCIAL AND ADMINISTRATIVE PHARMACY SCIENCES

- 41.** In an adequately powered, randomized controlled trial conducted over three years, a specific serious side effect (i.e., reduction in leukocytes) with conventional therapy is seen in 0.5% of the study sample. In patients who receive a newly discovered drug, only 0.45% experience the same side effect. Based on these results, the minimum number of patients that would have to receive the new drug for three years to statistically demonstrate the prevention of one episode of this side effect in at least one patient is:
- 15.
 - 20.
 - 150.
 - 200.
 - 2000.
- 42.** Which of the following is an example of a pharmacy's ability to provide a high net delivered customer value?
- Using a low dispensing fee to compete with other pharmacies and attract new customers
 - Offering compounding services in addition to standard prescription dispensing
 - Offering disease-prevention programs for a service fee
 - Providing compliance packaging and delivery to a local long-term care facility
 - Offering personal follow ups on a weekly basis with new product and service proposals
- 43.** "Medically necessary" services are established in Canada by the:
- provincial governments.
 - Canadian Medical Association.
 - federal government.
 - Royal College of Physicians and Surgeons of Canada.
- 44.** The term 'perspective' in the context of a pharmacoeconomic study refers to the:
- source of funding for conducting the pharmacoeconomic analysis.
 - approach the researcher takes to analyze the research problem.
 - approach the researcher uses to limit confounding factors.
 - stakeholder whose interest is most represented in the study's conclusions.
 - method used to facilitate communication of the study results in a journal publication.
- 45.** Which of the following would be the most effective method to prevent "inventory shrinkage" due to internal theft within a pharmacy?
- Assigning the responsibility of ordering and receiving inventory to one employee.
 - Implementing an employee bag check program at the end of shifts.
 - Hiring a uniformed security guard to monitor the pharmacy exits.
 - Offering incentives such as employee discounts on merchandise.
 - Installing mirrors and security cameras strategically throughout the pharmacy.

46. Which of the following is **NOT** useful as a strategy to prevent/control influenza among patients in a long-term care facility?
- a. Annual influenza vaccination for staff and patients
 - b. Monitoring for clusters of illness with similar symptoms
 - c. Isolating patients who exhibit respiratory symptoms
 - d. Routine hand-sanitizing requirement on entering and departing the building
 - e. Routine nasopharyngeal swabs of all patients experiencing respiratory symptoms
47. Which of the following medication orders is documented safely and appropriately?
- a. Digoxin .25 mg po daily
 - b. Lisinopril 12.5 mg po daily
 - c. Insulin glargine 10 U SC hs
 - d. Clonazepam 0.5 mg po ud
 - e. Aripiprazole 2.0 mg po daily
48. The Calls to Action related to health from Canada's Truth and Reconciliation Commission are intended to:
- a. improve transparency in the drug approval process by Health Canada.
 - b. promote reporting of communicable diseases in a timely manner by regional public health authorities.
 - c. address the historical and ongoing inequities in healthcare experienced by Indigenous peoples.
 - d. educate healthcare providers about the importance of obtaining informed consent from patients.
 - e. require provincial regulatory authorities to publish all complaints and disciplinary decisions affecting their members.
49. RG, a 23 year old female, presents to the community pharmacy for a refill of her oral tetracycline and adapalene gel that she uses for acne. She tells the pharmacist that she is excited about an upcoming two-week sun holiday to the Caribbean islands. If the pharmacist neglects to educate RG about the need for appropriate sun protection, which of the following ethical principles has been **VIOLATED** the most?
- a. Justice
 - b. Veracity
 - c. Autonomy
 - d. Nonmaleficence
50. The ceiling price of a newly patented medication in Canada is set:
- a. at the suggested list price by the pharmaceutical manufacturer.
 - b. at the price negotiated by the pan-Canadian Pharmaceutical Alliance.
 - c. at the price negotiated by the pharmaceutical manufacturer with the provincial drug plans.
 - d. at the minimum international price among seven comparator countries.
 - e. no higher than the median of international prices in seven comparator countries.

Answers to Sample Questions

1. (a)	11. (a)	21. (b)	31. (e)	41. (e)
2. (c)	12. (a)	22. (b)	32. (a)	42. (e)
3. (c)	13. (c)	23. (a)	33. (a)	43. (a)
4. (e)	14. (d)	24. (b)	34. (a)	44. (d)
5. (e)	15. (e)	25. (c)	35. (d)	45. (b)
6. (c)	16. (a)	26. (a)	36. (c)	46. (e)
7. (d)	17. (a)	27. (e)	37. (c)	47. (b)
8. (a)	18. (a)	28. (e)	38. (d)	48. (c)
9. (d)	19. (c)	29. (d)	39. (e)	49. (d)
10. (d)	20. (e)	30. (b)	40. (a)	50. (e)