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Topic Break Down

Topic	No. of Questions
Topic 1, Medications	374
Topic 2, Federal Requirements	124
Topic 3, Patient Safety and Quality Assurance	127
Topic 4, Order Entry and Processing	92
Topic 5, Mix Questions	8
Total	725

QUESTION NO: 1

If250 mL of a 15% solutionis diluted to1.2 L, what is the resulting percentage strength?

A. 0.72%

B. 3.1%

C. 3.6%

D. 72%

ANSWER: B

Explanation:

3.1% is correct because dilution changes the total volume of the preparation but does not change the amount of drug (solute) originally present. The starting 250 mL of a 15% solution contains an amount of solute represented by 15 × 250 = 3,750 percent-mL units. The final volume is 1.2 L, which must first be converted to 1,200 mL so that both volumes use the same unit. Applying the dilution relationship, $C_1V_1 = C_2V_2$, gives C_2 = (15% × 250 mL) ÷ 1,200 mL = 3.125%. Percentage strength is typically reported to the precision supported by the answer choices, so 3.125% rounds to 3.1%. This calculation reflects the key dilution principle used in pharmacy compounding: adding diluent lowers concentration in direct proportion to the increase in final volume. For an overview of pharmaceutical calculations and dilution concepts, see StatPearls: Pharmaceutical Calculations and the PTCB PTCE Content Outline.

QUESTION NO: 2

According tofederal law, records regarding thedistribution, receipt, or destructionofcontrolled substancesmust be maintained for a minimum ofhow many years?

A. 1

B. 2

C. 5

D. 7

ANSWER: B

Explanation:

The correct answer is **2**. Under the federal Controlled Substances Act and DEA recordkeeping regulations, a registrant, including a pharmacy, must keep required controlled-substance records and inventories for at least two years from the date they are created. This retention requirement applies to records documenting the receipt and distribution of controlled substances, as well as records of their disposal or destruction. Maintaining complete, readily retrievable records supports DEA oversight and accountability throughout the controlled-substance supply chain. In pharmacy practice, records may need to be retained longer when state law, a payer, an accreditation organization, or company policy imposes a longer period; however, the question asks specifically for the federal minimum. Therefore, two years is the applicable answer. The DEA's regulation at 21 CFR § 1304.04 states that every inventory and record required under its controlled-substance recordkeeping rules must be kept and made available for at least two years from the date of the inventory or record. See 21 CFR § 1304.04 and the DEA's Controlled Substances Act information page.

QUESTION NO: 3

A pharmacy must report the theft or significant loss of which of the following medications to the Drug Enforcement Administration (DEA)?

A. Pregabalin

B. Piroxicam

C. Prochlorperazine

D. Pioglitazone

ANSWER: A

Explanation:

Pregabalin is the correct answer because it is a Schedule V controlled substance under the federal Controlled Substances Act. Federal regulations require a DEA registrant, including a pharmacy, to notify the DEA in writing of any theft or significant loss of controlled substances within one business day of discovery. The registrant must then complete and submit DEA Form 106, the Report of Theft or Loss of Controlled Substances, through the DEA Diversion Control Division's reporting process. The requirement applies to controlled substances in Schedules II through V; therefore, it includes Schedule V products such as pregabalin. Whether a loss is "significant" is determined using the pharmacy's circumstances, including the quantity and type of drug involved, the pattern of losses, and whether the loss may indicate diversion. Pharmacists and pharmacy technicians should promptly escalate suspected thefts or significant discrepancies involving pregabalin to the pharmacist-in-charge so that the pharmacy can meet its notification, documentation, and reporting obligations. DEA scheduling information lists pregabalin in Schedule V, and DEA guidance describes the required theft-and-loss reporting process. See the DEA Controlled Substances Schedules and the DEA theft or loss reporting page.

QUESTION NO: 4

Dr. I Bawl has been practicing Ophthalmology in Mukilteo, WA since 1984. If the first part of his DEA number is: AB745142_

What would the last digit be?

A. 7

B. 3

C. 0

D. 2

ANSWER: C

Explanation:

The correct last digit is **0**. A DEA registration number uses two letters followed by seven digits. The final digit functions as a check digit, allowing the number to be validated through a standard arithmetic checksum. For the six displayed numeric digits, separate the digits in alternating positions: 7, 5, and 4 are added together for a subtotal of 16. The remaining digits, 4, 1, and 2, total 7; this subtotal is doubled to produce 14. Adding the two results gives 30. The final digit of that total is 0, so the required check digit is 0 and the completed numeric portion is 7451420.

The two letters establish the DEA-number prefix format, while the checksum calculation is based on the six preceding numeric digits. The prescriber's specialty, practice location, and years in practice do not alter this check-digit calculation. DEA registration numbers are issued and administered through the DEA Diversion Control Division; see the DEA Registration information page and the DEA's registration validation portal.

QUESTION NO: 5

Which of the following suppositories should be shipped to the pharmacy in arefrigerated container?

A. Promethazine

B. Prochlorperazine

C. Hydrocortisone

D. Bisacodyl

ANSWER: A

Explanation:

Promethazine is correct because promethazine hydrochloride suppositories require refrigerated storage to preserve the product's quality during distribution and pharmacy receipt. The labeled storage condition for promethazine suppositories is generally 2°C to 8°C (36°F to 46°F), with protection from light. Therefore, shipment to a pharmacy should maintain this refrigerated temperature range by using an appropriate cold-chain container and packing materials. Pharmacy personnel should verify that the product arrives without evidence of temperature excursion, damage, or thawing/melting, and should place it into refrigerated storage promptly after receipt. Maintaining the labeled temperature is especially important for suppository dosage forms because their base can soften or deform when exposed to excessive heat, which can affect dose uniformity, appearance, and patient usability. The manufacturer's current labeling and product-specific package information should always be consulted, since storage requirements are determined by the exact formulation and manufacturer. Refrigerated shipment is appropriate when it is needed to ensure the medication remains within its labeled storage conditions throughout transit. See the promethazine suppository listing at DailyMed and FDA-approved prescribing information resources at Drugs@FDA.

QUESTION NO: 6

Which type of injection administers a medication into theskin?

A. Intraperitoneal

B. Intravenous

C. Intramuscular

D. Intradermal

ANSWER: D

Explanation:

Intradermal is correct because an intradermal injection places medication into the dermis, the skin layer located directly beneath the epidermis. This route is designed for very small volumes and creates a localized reaction in the skin, which makes it useful for procedures such as tuberculosis screening and allergy testing. Proper intradermal administration generally uses a fine needle inserted at a very shallow angle, commonly about 5 to 15 degrees, with the bevel up. A small raised wheal or bleb at the injection site indicates that the solution has been deposited within the dermal layer. Pharmacy technicians should recognize injection routes and their usual sites and purposes so that prescriptions, supplies, and patient-care instructions can be handled accurately within their scope of practice. The Centers for Disease Control and Prevention includes intradermal administration among the standard parenteral routes and describes its use for selected testing and immunization procedures. See the CDC's Vaccine Administration guidance and the NCBI Bookshelf's overview of intradermal injection technique.

QUESTION NO: 7

A pharmacy computer system is likely to display atherapeutic duplication alertif a prescription forBriviactis processed for a patient already taking:

A. Ancef

B. Ambien

C. Vimpat

D. Vyvanse

ANSWER: C

Explanation:

Vimpat is the correct selection because Vimpat contains lacosamide and Briviact contains brivaracetam; both are antiseizure medications used in the management of partial-onset seizures. Pharmacy clinical decision-support systems commonly use therapeutic-class information to identify situations in which a patient is receiving more than one medication intended to manage the same condition. When Briviact is entered for a patient with an active Vimpat prescription, the system may therefore generate a therapeutic duplication alert. The purpose of this alert is to prompt the pharmacist to review the patient's medication profile, indication, prescribed regimen, and potential for additive adverse effects before dispensing. Importantly, an alert does not by itself mean the combination is inappropriate. Patients with epilepsy may appropriately receive more than one antiseizure medication when clinically indicated, but the combination warrants pharmacist review and, when needed, clarification with the prescriber. The FDA prescribing information identifies Briviact as brivaracetam for treatment of partial-onset seizures and Vimpat as lacosamide for treatment of partial-onset seizures, supporting their overlapping therapeutic use. See the FDA labels for Briviact and Vimpat.

QUESTION NO: 8

While compounding anonsterile preparation, physical incompatibilities may be avoided by following the specific mixing instructions found in the:

A. Medication Guide

B. Master Formulation Record

C. Patient Package Insert

D. Safety Data Sheet (SDS)

ANSWER: B

Explanation:

Master Formulation Record is correct because it is the standardized, formulation-specific document used to prepare a nonsterile compounded preparation consistently. It identifies the ingredients and their quantities, dosage form, required equipment, beyond-use dating information, packaging and labeling directions, and—most importantly for this question—the detailed compounding procedure. Those procedural directions can specify the appropriate order of ingredient addition, levigation or trituration method, dilution steps, mixing technique, and other handling requirements needed to produce a uniform and physically stable preparation. Following the established procedure helps prevent problems such as precipitation, separation, clumping, incomplete dispersion, or other physical incompatibilities that may occur when ingredients are combined incorrectly. The Master Formulation Record is prepared and maintained for a particular formulation, while the related compounding record documents the details of an individual preparation made from that formulation. USP's nonsterile compounding standards describe the need for formulation records and appropriate compounding procedures to support quality and consistency. See USP General Chapter <795> Pharmaceutical Compounding—Nonsterile Preparations and the FDA's record requirements at 21 CFR 211.186.

QUESTION NO: 9

The directions for a Z-Pak specify:

A. 1 tablet PO on the current day, then 1 PO daily for 4 days.

B. 1 tablet PO on the current day, then 1 PO daily for 5 days.

C. 2 tablets PO on the current day, then 1 PO daily for 4 days.

D. 3 tablets PO on the current day, then 1 PO every other day for 6 days.

ANSWER: C

Explanation:

The correct directions are **2 tablets PO on the current day, then 1 PO daily for 4 days.** A Z-Pak is the commonly used name for the azithromycin 250 mg five-day dose pack. Its labeled adult regimen begins with a loading dose of 500 mg on day 1, supplied as two 250 mg tablets taken orally. This larger first-day dose rapidly establishes appropriate azithromycin concentrations in body tissues. On days 2 through 5, the patient takes one 250 mg tablet orally each day. The complete course therefore contains six 250 mg tablets administered over five days. “PO” means by mouth (orally), and “on the current day” reflects that treatment starts on the day the prescription is dispensed or the directions are initiated, unless the prescriber specifies otherwise. Pharmacy technicians should accurately interpret the package directions, select the correct quantity and days’ supply, and refer clinical questions or discrepancies to the pharmacist. The FDA-approved prescribing information describes the 500 mg dose on day 1 followed by 250 mg once daily on days 2 through 5 for the applicable infection indications. See the FDA azithromycin prescribing information and DailyMed azithromycin labeling.

QUESTION NO: 10

Which of the following would a patient be prescribed an Albuterol Inhaler for?

A. Hypertension

B. Asthma

C. Smoking Cessation

D. Post Myocardial Infarction

ANSWER: B

Explanation:

Asthma is the correct answer. Albuterol is a short-acting beta$_2$-adrenergic agonist bronchodilator, commonly called a “rescue inhaler.” It works by relaxing smooth muscle in the airways, producing rapid bronchodilation and improving airflow. This relieves acute symptoms such as wheezing, chest tightness, coughing, and shortness of breath associated with asthma. Patients may use an albuterol inhaler to treat an asthma exacerbation as needed and, when instructed by their prescriber, before exercise to prevent exercise-induced bronchospasm. Pharmacy technicians should recognize albuterol as a medication commonly dispensed for asthma and should ensure that the prescribed product, dosage form, and inhaler device are selected accurately. Because inhaler technique substantially affects medication delivery, patients should be directed to the pharmacist for counseling on correct priming, inhalation, and cleaning instructions. The FDA-approved prescribing information identifies albuterol sulfate inhalation aerosol for treatment or prevention of bronchospasm in patients with reversible obstructive airway disease, including asthma. More information is available in the DailyMed albuterol sulfate inhalation aerosol labeling and the National Heart, Lung, and Blood Institute asthma overview.

QUESTION NO: 11

A drug patent gives its inventor the exclusive rights to manufacture and market a drug. The patent lasts __ years and that period begins _____.

A. 10 years, upon FDA approval.

B. 10 years, upon original filing.

C. 20 years, upon FDA approval.

D. 20 years, upon original filing.

ANSWER: D

Explanation:

A drug patent generally lasts 20 years from the filing date of the patent application, so “20 years, upon original filing” is the correct response. In the United States, the standard patent term is measured from the earliest effective filing date of the

application, rather than from the date the FDA approves the medication. This distinction matters because a drug developer may file a patent application years before completing clinical trials and obtaining marketing approval. The patent can therefore be in force during research, development, and regulatory review, leaving a shorter portion of the ordinary patent term after the product reaches the market.

For applications filed on or after June 8, 1995, federal patent law provides a term ending 20 years after the relevant filing date. Some drug patents may receive a limited patent-term extension to partly account for time spent in FDA regulatory review, but that potential extension does not change the standard rule being tested here. Pharmacy technicians should recognize that patent protection and FDA approval are separate legal and regulatory events. The statutory basis is available in 35 U.S.C. § 154, and the USPTO summarizes patent-term rules in its Manual of Patent Examining Procedure, § 2701.

QUESTION NO: 12

Hypoglycemiais a common side effect of:

A. Haloperidol

B. Gemfibrozil

C. Glipizide

D. Hydrochlorothiazide

ANSWER: C

Explanation:

Glipizide is correct because it is a sulfonylurea used to lower blood glucose in people with type 2 diabetes. Sulfonylureas work primarily by stimulating pancreatic beta cells to release insulin. Because insulin moves glucose from the bloodstream into tissues, this insulin-releasing effect can lower blood glucose too far, resulting in hypoglycemia. The risk is particularly important when a dose is too high for the patient's food intake, when meals are skipped or delayed, after unusual exercise, or when interacting medicines or illness alter glucose control.

Pharmacy technicians should recognize hypoglycemia as a clinically significant and commonly counseled adverse effect of glipizide. Patients taking this medicine should be taught to recognize symptoms such as sweating, shakiness, hunger, dizziness, palpitations, confusion, or irritability and to follow their pharmacist's or prescriber's instructions for prompt treatment. Severe hypoglycemia may cause loss of consciousness or seizures and requires urgent assistance. The official prescribing information specifically identifies hypoglycemia as an important risk of glipizide therapy and advises patient education about recognizing and managing low blood sugar. See the FDA Glucotrol prescribing information and American Diabetes Association guidance on hypoglycemia.

QUESTION NO: 13

A customer has dropped off a prescription order for Benazepril. Which of the following conditions does our customer most likely need this for?

A. Epilepsy

B. Type II Diabetes

C. Hypertension

D. Ear Infection

ANSWER: C

Explanation:

Hypertension is the most likely indication for benazepril. Benazepril is an angiotensin-converting enzyme (ACE) inhibitor that lowers blood pressure by reducing formation of angiotensin II, a substance that constricts blood vessels. With less angiotensin II activity, blood vessels relax and widen, reducing systemic vascular resistance and helping lower blood

pressure. It is commonly used as part of long-term hypertension management, either alone or in combination with other antihypertensive medications. Pharmacy technicians should recognize benazepril as a medication in the ACE-inhibitor class and associate it primarily with blood-pressure treatment. The product labeling describes benazepril hydrochloride tablets as indicated for treatment of hypertension, including use alone or together with thiazide diuretics. The medication may also be prescribed in some patients for additional cardiovascular or renal-related clinical purposes determined by a prescriber, but hypertension is the standard and most likely reason when selecting from the listed conditions. For more information, consult the DailyMed benazepril prescribing information and the NCBI StatPearls review of benazepril.

QUESTION NO: 14

The main purpose of OSHA is to?

A. Ensure the safety of the workplace

ANSWER: A

Explanation:

Ensure the safety of the workplace is correct because the Occupational Safety and Health Administration (OSHA) exists to help assure safe and healthful working conditions for employees. OSHA carries out this purpose by setting and enforcing workplace safety and health standards, conducting inspections, investigating certain workplace incidents, providing education and training, and supporting employers and workers with compliance assistance. In pharmacy settings, OSHA-related protections can include requirements and guidance concerning hazard communication, bloodborne pathogens, personal protective equipment, safe handling of hazardous chemicals, and maintaining an environment that reduces preventable injury or illness. The focus is not merely on responding after an injury occurs; it is to prevent occupational hazards through standards, employee rights, employer responsibilities, and safe work practices. Pharmacy technicians should recognize OSHA as the federal agency associated with workplace safety and employee health protections. OSHA's statutory mission is to ensure safe and healthful working conditions by establishing and enforcing standards and by providing training, outreach, education, and assistance. See OSHA's About OSHA page and its Occupational Safety and Health Act, Section 2 for the agency's purpose and policy foundation.

QUESTION NO: 15

Which of the following classes of antibiotics should not be taken with either fruit juices or colas?

A. Macrolides

B. Penicillins

C. Quinolones

D. Sulfas

ANSWER: B

Explanation:

Penicillins is the intended answer because acidic beverages, including many fruit juices and colas, have traditionally been taught as potentially problematic for acid-labile penicillin products. Penicillin is a beta-lactam antibiotic, and the beta-lactam ring of certain penicillin formulations is susceptible to degradation under acidic conditions. This degradation can reduce the amount of active drug available for absorption and therefore may reduce therapeutic effectiveness. Historically, this is especially relevant to penicillin G, which is unstable in gastric acid and consequently is administered parenterally rather than orally. Reference materials distinguish this acid sensitivity from acid-stable oral penicillins, such as penicillin V; nevertheless, in the broad medication-administration guidance tested by this question, patients are directed to avoid taking penicillin products with acidic drinks and to use water unless the dispensing label or pharmacist provides different instructions. Individual products have formulation-specific administration directions, so pharmacy personnel should verify the prescription label and manufacturer information when counseling a patient. The acid instability of penicillin G is described by Merck Manual Professional Edition and by StatPearls: Penicillin.

QUESTION NO: 16

Adult and pediatric strengths of the same vaccine are often packaged similarly.As a safety precaution, theCDCrecommends that pharmacies do which of the following?

A. Remove vaccines from the original packaging and repackage

B. Order each strength from different manufacturers

C. Store each strength in different locations within the storage unit

D. Make products available only in an automated dispensing system

ANSWER: C

Explanation:

Store each strength in different locations within the storage unit is correct because physical separation is an important error-prevention strategy when vaccine products have similar packaging, names, or labeling but differ in formulation, concentration, or intended age group. Placing adult and pediatric presentations in distinct, clearly designated areas of the refrigerator or freezer helps staff select the intended product during receiving, stocking, preparation, and administration. This workflow safeguard is especially valuable in busy pharmacies, where visual similarity and time pressure can contribute to selection errors.

CDC vaccine-storage guidance emphasizes organizing inventory so products are easily identified, keeping vaccines in their original packaging, and arranging stock to reduce confusion while maintaining appropriate temperature conditions. Clear location separation can be reinforced with shelf labels that identify the vaccine name, presentation, age indication, and expiration-management process. The Institute for Safe Medication Practices likewise identifies storage segregation and differentiation of look-alike products as practical system-level safeguards against vaccine mix-ups. Using different locations does not replace checking the product label, patient age, dose, route, and immunization schedule; it supports those required verification steps by making the correct selection more reliable from the outset. See the CDC's Vaccine Storage and Handling resources and ISMP's Vaccine Safety recommendations.

QUESTION NO: 17

Which of the following drugs should not be stocked on an adult crash cart?

A. Nitroglycerin patches

ANSWER: A

Explanation:

Nitroglycerin patches should not be stocked on an adult crash cart because transdermal nitroglycerin is intended for scheduled prevention of angina rather than rapid treatment during a cardiopulmonary emergency. The patch delivers medication gradually through the skin, with a delayed onset that does not meet the need for immediately titratable emergency therapy. Crash carts are designed to provide medications and equipment used in urgent resuscitation and acute stabilization, so their medication contents emphasize agents that can be administered promptly and whose effects can be assessed quickly. In contrast, nitroglycerin patches are generally used as part of a maintenance regimen and require attention to dosing schedules and nitrate-free intervals to limit tolerance. Their delayed, sustained delivery also makes them unsuitable when clinicians must respond rapidly to changing blood pressure, perfusion, chest-pain symptoms, or resuscitation status. The American Heart Association's adult advanced cardiovascular life support guidance focuses emergency treatment on immediate assessment, high-quality resuscitation, defibrillation when indicated, and appropriate acute medications rather than maintenance transdermal antianginal therapy. See the American Heart Association CPR and ECC Guidelines and the DailyMed nitroglycerin transdermal system prescribing information.

QUESTION NO: 18

The directions for aZ-Pak (azithromycin)specify:

A. 1 tablet PO on the current day, then 1 PO daily for 4 days.

B. 1 tablet PO on the current day, then 1 PO daily for 5 days.

C. 2 tablets PO on the current day, then 1 PO daily for 4 days.

D. 3 tablets PO on the current day, then 1 PO every other day for 6 days.

ANSWER: C

Explanation:

“2 tablets PO on the current day, then 1 PO daily for 4 days.” is the standard administration schedule for the commonly dispensed azithromycin 250 mg five-day Z-Pak regimen. The first day is a loading-dose day: taking two 250 mg tablets provides 500 mg total. This is followed by one 250 mg tablet once daily for the next four days. The full regimen therefore contains six 250 mg tablets and delivers a total of 1.5 g of azithromycin over five days. “PO” means by mouth, so the directions communicate both the route and the day-by-day quantity to take. Pharmacy technicians should recognize this package-specific pattern when entering, filling, and reviewing prescriptions, while also ensuring the prescriber’s directions match the product strength and intended indication. The FDA-approved prescribing information describes the adult five-day regimen as 500 mg as a single dose on day 1, followed by 250 mg once daily on days 2 through 5. The manufacturer’s patient information similarly identifies the six-tablet, five-day dispensing schedule. See the DailyMed azithromycin prescribing information and the FDA azithromycin label.

QUESTION NO: 19

Which of the following is the correct interpretation of "Sig: 1 tab PO q.i.d. p.c. & h.s."?

A. Take one tablet by mouth five times daily with meals and at bedtime.

B. Take one tablet by mouth four times daily without meals and at bedtime with a snack.

C. Take one tablet by mouth four times daily before meals and at bedtime.

D. Take one tablet by mouth four times daily after meals and at bedtime.

ANSWER: D

Explanation:

“Take one tablet by mouth four times daily after meals and at bedtime.” is the correct interpretation of the prescription’s Sig. “1 tab” specifies a dose of one tablet, and “PO” (per os) directs that the medication be taken orally, or by mouth. “q.i.d.” means four times daily. The timing instructions clarify how those four daily administrations should be scheduled: “p.c.” means after meals (post cibum), and “h.s.” means at bedtime (hora somni). In practical patient-friendly language, this is commonly understood as one dose after each meal and one dose at bedtime. Pharmacy personnel should accurately translate the prescriber’s directions onto the dispensing label while maintaining the intended dose, route, frequency, and timing. Because abbreviations can contribute to medication-use errors, pharmacy practice emphasizes using clear, standardized language on patient labels whenever possible. The Institute for Safe Medication Practices provides safety guidance on abbreviation use at ISMP’s error-prone abbreviations list. Additional medication-labeling and patient-use information is available from the FDA’s drug labeling resources.

QUESTION NO: 20

A patient weights 218 Lbs. What is their weight in Kg?

A. 479Kg

B. 109Kg

C. 409Kg

D. 99Kg

ANSWER: D

Explanation:

99Kg is correct. To convert a patient's weight from pounds to kilograms, divide the number of pounds by approximately 2.2, because 1 kilogram equals about 2.2 pounds. The calculation is 218 lb ÷ 2.2 = 99.09 kg. Pharmacy calculations are generally reported to a practical level of precision appropriate for the question, so 99.09 kg rounds to 99 kg.

This conversion is clinically important because many medication doses, particularly pediatric and weight-based doses, are prescribed in milligrams per kilogram. Using the patient's weight in kilograms helps ensure that the dose calculation uses the unit specified by the prescription, protocol, or drug reference. When a more precise conversion factor is needed, 1 lb equals 0.45359237 kg; multiplying 218 lb by this factor gives approximately 98.88 kg, which also rounds to 99 kg. The National Institute of Standards and Technology provides the standard pound-to-kilogram relationship in its SI Units of Mass reference. For pharmacy technicians, performing the conversion carefully and retaining appropriate precision until the final rounding step supports safe dose preparation and verification.

QUESTION NO: 21

Which of the following medications is ahormonethat would be appropriate for pharmacies todispose of as hazardous waste?

A. Naloxone

B. Nabumetone

C. Norethindrone

D. Nortriptyline

ANSWER: C

Explanation:

Norethindrone is correct because it is a synthetic progestin, meaning it has hormone-like activity similar to progesterone. It is used in hormonal contraceptive products and in some treatments for menstrual disorders or endometriosis. Hazardous-drug precautions are appropriate for medications with reproductive toxicity concerns, including certain hormonal agents. Norethindrone appears on the National Institute for Occupational Safety and Health hazardous-drug list because of its potential reproductive hazard. In pharmacy practice, hazardous drugs require procedures that limit occupational exposure during receiving, storage, handling, compounding, dispensing, and waste management. Waste that is contaminated with a hazardous drug, such as unused dosage units or materials used to handle it, should be segregated and managed under the pharmacy's hazardous-drug waste procedures and applicable federal, state, and local requirements. USP <800> establishes standards intended to protect personnel and the environment when handling hazardous drugs, including expectations for containment and disposal processes. The National Institute for Occupational Safety and Health list is a key source for identifying medications that need hazardous-drug handling precautions. See the National Institute for Occupational Safety and Health hazardous-drug list and the USP <800> hazardous-drug handling overview.

QUESTION NO: 22

Which of the following statements regardingspecific patient medication returns in the hospital settingis correct?

A. Unlabeled medications may be dispensed by the nurse at discharge.

B. Unopened units-of-use returned from outpatients may be redispensed.

C. Unopened units-of-use returned from inpatients may be redispensed.

D. Crediting of unused doses is not feasible.

ANSWER: C

Explanation:

“Unopened units-of-use returned from inpatients may be redispensed” is correct because a hospital pharmacy may return a medication to usable inventory when the product’s identity, integrity, storage conditions, and expiration status can be verified. This commonly applies to intact unit-dose or unit-of-use packages that were dispensed for an inpatient but were not administered. Before redispensing, pharmacy personnel must ensure the package remains sealed and has not been contaminated, damaged, altered, or stored outside required temperature, light, humidity, or security conditions. The medication must also remain within its manufacturer-assigned expiration date and be handled according to the hospital’s policies, applicable state board-of-pharmacy rules, and any medication-specific requirements. Proper control of medications is a core hospital pharmacy obligation; CMS requires drugs and biologicals to be controlled and properly stored under appropriate conditions. Returning eligible, intact inpatient doses to stock can reduce waste while preserving medication safety and accountability. Pharmacy technicians support this process by following the organization’s return-to-stock procedure and referring any questionable item to the pharmacist rather than making independent reuse decisions. See the CMS hospital pharmaceutical-services requirement at 42 CFR § 482.25 and ASHP medication-safety resources at ASHP Medication Safety.

QUESTION NO: 23

The use of Tall Man lettering:

A. highlights the similarities in drug names.

B. ensures all trade names will be capitalized.

C. draws attention to the differences in drug names.

D. keeps the pharmacy inventory in alphabetic order.

ANSWER: C

Explanation:

Tall Man lettering draws attention to the differences in drug names. It is a medication-safety convention used for selected look-alike/sound-alike drug-name pairs, in which distinct letter segments are displayed in uppercase letters within an otherwise lowercase name. For example, “hydrOXYzine” and “hydrALAzine” emphasize the portions that help a reader distinguish these two easily confused names. The purpose is to make meaningful differences more visually prominent during prescribing, order entry, dispensing, verification, and administration. This added visual cue supports safer medication-use processes by reducing the likelihood that a clinician or pharmacy technician will misread, select, prepare, or dispense the wrong drug solely because names appear or sound similar. Tall Man lettering is one component of a broader strategy for managing look-alike/sound-alike medication risks; it should be applied consistently wherever the applicable medication names appear, including labels, computer displays, and storage or workflow tools as appropriate. The Institute for Safe Medication Practices maintains guidance and examples for the use of Tall Man letters, and the FDA also provides an official Name Differentiation Project list. See the ISMP Tall Man Letters List and the FDA Tall Man Lettering List.

QUESTION NO: 24

A prescription reads: Nitrostat 0.4mg SL Q5MIN PRN chest pain. Do not exceed 3 doses. What should the label placed on the patient’s packaging read?

A. Take 1 tablet by mouth every 5 minutes as needed for chest pain.

B. Dissolve 1 tablet under the tongue every 5 minutes as needed for chest pain. Do not take more than 3 doses.

C. Take 1 tablet at bedtime as needed for chest pain.

D. Chew 1 tablet every 5 minutes as needed for chest pain.

ANSWER: B

Explanation:

“Dissolve 1 tablet under the tongue every 5 minutes as needed for chest pain. Do not take more than 3 doses.” is correct. The abbreviation *SL* means sublingual, or under the tongue, and *Q5MIN* means every 5 minutes. PRN means as needed. The directions should be written in clear patient-friendly language rather than using abbreviations.

Nitrostat is a sublingual nitroglycerin tablet. The limit of three doses must remain on the patient label because it is part of the prescribed directions. The FDA-approved labeling for Nitrostat describes sublingual administration and repeat dosing at 5-minute intervals. See the DailyMed Nitrostat labeling search and the Institute for Safe Medication Practices abbreviation guidance.

QUESTION NO: 25

A company that is able to receive and dispose of expired medications from a pharmacy is called a:

A. Secondary wholesaler.

B. Cancer drug repository.

C. Reverse distributor.

D. Prime vendor.

ANSWER: C

Explanation:

Reverse distributor. is correct because a reverse distributor is a company that manages the return, processing, and appropriate disposition of pharmaceuticals that a pharmacy can no longer use, such as expired, damaged, recalled, or otherwise unsalable stock. Pharmacies commonly send these products to a reverse distributor, which evaluates whether an eligible product may be returned for manufacturer credit and arranges compliant destruction or disposal when return is not possible. This service supports proper inventory control while helping pharmacies meet drug-handling requirements. For controlled substances, reverse distribution is subject to specific DEA requirements: a DEA-registered reverse distributor may receive controlled-substance inventory from registrants for destruction and must handle the transfer and destruction in accordance with applicable federal rules. The DEA’s regulations describe reverse distributors and their role in acquiring controlled substances from registrants for return or destruction. The FDA also provides guidance on safe disposal practices for medicines that cannot be retained or returned. See the DEA reverse-distributor requirements in 21 CFR § 1301.72 and the FDA guidance on disposal of unused medicines.

QUESTION NO: 26

A patient calls to request a refill for the following prescription:

Amlodipine 10 mg tablets

Take one-half tablet by mouth twice a day

#30

The medication fill records show that the prescription was filled 16 days ago, but the patient says that they just took the last tablet. It appears that the patient was incorrectly taking:

A. 5 mg by mouth once daily.

B. 5 mg by mouth twice a day.

C. 10 mg by mouth once daily.

D. 10 mg by mouth twice a day.

ANSWER: D

Explanation:

10 mg by mouth twice a day. is correct. The prescribed directions instruct the patient to take one-half of a 10 mg tablet twice daily. Each half tablet supplies 5 mg, and two half-tablet doses per day use a total of one 10 mg tablet daily. Therefore, the dispensed quantity of 30 tablets is intended to provide a 30-day supply. If all 30 tablets were gone approximately 16 days after dispensing, the patient used roughly two tablets each day rather than one. Taking a full 10 mg tablet twice daily would use two tablets per day and consume a 30-tablet supply in about 15 days, which reasonably corresponds to the reported timing. This type of day-supply comparison is an important refill-troubleshooting calculation: determine the prescribed number of dosage units per day, compare it with the quantity dispensed, and use the actual depletion time to identify a likely administration discrepancy. Amlodipine is available as 10 mg tablets, as reflected in the official product labeling from the FDA. Pharmacy technicians should escalate suspected dosing misunderstandings to the pharmacist for patient assessment, counseling, and appropriate clinical follow-up, consistent with the role expectations described by the PTCB certification exam content outline.

QUESTION NO: 27

Which drug is a proton pump inhibitor used in the treatment of symptomatic gastroesophageal reflux disease (GERD)?

A. Esomeprazole

B. Methimazole

C. Carvedilol

D. Esmolol

ANSWER: A

Explanation:

Esomeprazole is a proton pump inhibitor used to treat symptomatic gastroesophageal reflux disease by decreasing gastric acid production. Proton pump inhibitors act in gastric parietal cells, where they irreversibly inhibit the hydrogen-potassium ATPase enzyme system (the “proton pump”), the final common pathway for acid secretion. This strong acid suppression helps relieve the typical GERD symptoms of heartburn and acid regurgitation and supports healing in patients who have acid-related esophageal injury. Esomeprazole is the S-isomer of omeprazole and is available in prescription and certain nonprescription products, depending on the formulation and indication. For pharmacy technician exam preparation, recognizing the characteristic “-prazole” naming pattern is a useful way to identify many drugs in the proton pump inhibitor class, including omeprazole, pantoprazole, lansoprazole, rabeprazole, and dexlansoprazole. The FDA-approved labeling for esomeprazole specifically includes treatment of GERD in appropriate patients, and MedlinePlus describes its role in reducing stomach acid and treating reflux-related conditions. See the FDA prescribing information for Nexium (esomeprazole) and MedlinePlus: Esomeprazole.

QUESTION NO: 28

A prescription for 1 pint of rifampin 1% suspension. 2 tbsp daily, will be compounded using how many 300 mg capsules of the drug?

A. 8

B. 16

C. 32

D. 160

ANSWER: B

Explanation:

The correct answer is **16**. A 1% w/v suspension contains 1 g of drug per 100 mL, which is equivalent to 10 mg/mL. In pharmacy-compounding calculations, 1 pint is commonly approximated as 480 mL. Therefore, the required amount of rifampin is 480 mL × 10 mg/mL = 4,800 mg. Each available capsule contains 300 mg, so 4,800 mg ÷ 300 mg per capsule =

16 capsules. The “2 tbsp daily” instruction describes the patient’s administration schedule and does not change the total amount of drug needed to prepare the prescribed one-pint quantity. This calculation uses standard pharmacy measurement approximations and percentage-strength conventions for preparations expressed as weight per volume. The FDA’s dosage-form guidance describes oral suspensions as liquid preparations containing drug dispersed in a vehicle, while standard measurement references define the U.S. liquid pint and its relationship to volume units. See the FDA guidance document database and the NIST unit-conversion resources.

QUESTION NO: 29

A patient presents the following prescription:

Amoxicillin 250 mg/5 mL

1 tsp tid x 10 days

How much of the medication, in mL, will be used during the first 5 days of therapy?

A. 25

B. 50

C. 75

D. 150

ANSWER: C

Explanation:

The correct answer is **75 mL**. In prescription calculations, 1 teaspoonful (tsp) is equivalent to 5 mL. The directions “1 tsp tid” mean the patient takes 5 mL three times each day. Therefore, the daily volume is 5 mL per dose multiplied by 3 doses per day, or 15 mL per day. For the first 5 days of treatment, multiply 15 mL per day by 5 days: 15 × 5 = 75 mL. The concentration, 250 mg per 5 mL, identifies the strength of the suspension but is not needed to determine the volume used because the prescribed dose is already expressed as a teaspoonful. Pharmacy technicians should consistently convert household-volume units to metric units before calculating the total quantity to dispense or the amount a patient will consume. The standard conversion of 1 teaspoonful to 5 mL is used for prescription processing and patient dosing calculations. See the National Institute of Standards and Technology SI units guidance and the PTCB Certification Exam Guidebook for pharmacy-calculation competency information.

QUESTION NO: 30

The use of amoxicillin/clavulanate is contraindicated in patients who:

A. Have a hypersensitivity to beta-lactams.

B. Are hypersensitive to quinolones.

C. Are pregnant or breastfeeding.

D. Have high blood pressure.

ANSWER: A

Explanation:

Have a hypersensitivity to beta-lactams. Amoxicillin/clavulanate combines amoxicillin, an aminopenicillin antibiotic, with clavulanate, a beta-lactamase inhibitor. Product labeling contraindicates its use in patients with a history of serious hypersensitivity reactions to amoxicillin, clavulanate, or other beta-lactam antibacterial drugs, including penicillins and cephalosporins. Such reactions can include anaphylaxis and other severe immune-mediated reactions; therefore, screening and documenting medication allergies before dispensing is an essential pharmacy safety step.

For a pharmacy technician, the practical implication is to recognize a reported serious penicillin or related beta-lactam allergy as a reason to stop and refer the prescription to the pharmacist for clinical assessment rather than proceeding with routine filling. The pharmacist can determine whether the reported reaction represents a true contraindicating allergy, whether the prescriber should be contacted, and whether an alternative is needed. This aligns with the FDA-approved prescribing information for Augmentin, which specifically identifies serious hypersensitivity to beta-lactam agents as a contraindication. See the FDA Augmentin prescribing information and NCBI StatPearls: Amoxicillin/Clavulanate.

QUESTION NO: 31

1 liter of a solution contains 5 Grams of a drug. How much would be present in 750ml of that solution?

A. 3750mg

B. 1500mg

C. 2750mg

D. 4000mg

ANSWER: A

Explanation:

The correct amount is **3750mg**. First, convert the drug quantity in 1 liter to milligrams: 5 grams equals 5,000 milligrams, because each gram contains 1,000 milligrams. The solution therefore has a concentration of 5,000 mg per 1,000 mL. Since 750 mL is three-quarters of 1,000 mL, it contains three-quarters of the total drug quantity in the liter. Multiplying 5,000 mg by 0.75 gives 3,750 mg. Equivalently, the concentration can be expressed as 5 mg/mL, and multiplying 5 mg/mL by 750 mL also gives 3,750 mg. Dimensional analysis confirms that the mL units cancel, leaving the required dose amount in mg. This type of proportional calculation is essential in pharmacy practice because the amount of medication withdrawn or administered must correspond precisely to the available solution concentration and ordered volume. For standard metric conversions used in medication calculations, see the National Institute of Standards and Technology SI units reference. Additional pharmacy technician calculation guidance is available from the PTCB PTCE content outline.

QUESTION NO: 32

An oral preparation containing a drug in a sweetened alcohol vehicle is called a(n):

A. Emulsion

B. Syrup

C. Solution

D. Elixir

ANSWER: D

Explanation:

Elixir is correct because an elixir is a clear, sweetened oral liquid in which one or more active ingredients are dissolved in a hydroalcoholic vehicle. “Hydroalcoholic” means the vehicle contains both water and alcohol, commonly ethanol. The alcohol can help dissolve drug substances or flavoring ingredients that are not sufficiently soluble in water alone, while sweeteners and flavorings improve palatability for oral administration. Elixirs are solutions rather than suspensions or dispersions, so the drug is dissolved uniformly throughout the preparation. Pharmacy technicians need to recognize this dosage-form terminology because it affects product identification, storage considerations, auxiliary labeling, and patient counseling workflows. The definition in the question specifically combines the key identifying characteristics of an elixir: oral use, sweetness, and an alcohol-containing vehicle. The FDA’s dosage-form terminology identifies elixirs as clear, sweetened hydroalcoholic solutions intended for oral use. See the FDA Pharmaceutical Dosage Forms resource and the National Library of Medicine’s Dosage Forms overview for descriptions of liquid oral formulations.

QUESTION NO: 33

" NS " refers to which of the following products?

A. 0.45% sodium chloride solution

B. 0.9% sodium chloride solution

C. 23.4% sodium chloride solution

D. Any solution of sodium chloride in sterile water

ANSWER: B

Explanation:

"NS" is the standard clinical abbreviation for normal saline, which is a sterile 0.9% sodium chloride solution in water for injection. This concentration contains 9 g of sodium chloride per liter and is approximately isotonic with plasma, meaning its effective tonicity is close to that of extracellular body fluids. In pharmacy practice, normal saline is commonly supplied in bags, bottles, syringes, and flush products and may be used as an intravenous fluid, as a compatible diluent for certain medications, or for line flushing when the specific product and route are appropriate. Pharmacy technicians should recognize that abbreviations for intravenous solutions identify a particular concentration, not simply any preparation containing sodium chloride. Correct identification supports accurate product selection during preparation, labeling, dispensing, and sterile-compounding workflows. The U.S. National Library of Medicine's DailyMed labeling for Sodium Chloride Injection, 0.9%, identifies the product as a sterile sodium chloride solution for intravenous use: DailyMed: 0.9% Sodium Chloride Injection. Additional clinical product information is available from StatPearls: Normal Saline.

QUESTION NO: 34

A patient presents the following prescription:

Lisinopril 20 mg tablets

Take 1 tab PO q8h

#30 with 12 refills

In order to fill this prescription, the pharmacy must clarify the:

A. directions for use.

B. medication strength.

C. route of administration.

D. number of refills.

ANSWER: A

Explanation:

The correct item to clarify is **directions for use.** The instruction "Take 1 tab PO q8h" directs the patient to take lisinopril 20 mg every eight hours, for a total daily dose of 60 mg administered in three divided doses. Although the directions can be interpreted, this frequency is atypical for lisinopril and warrants prescriber verification before dispensing. Lisinopril is generally dosed once daily; its FDA-approved labeling describes usual adult hypertension dosing as a single daily dose, with dose adjustment based on blood-pressure response. A frequency that substantially differs from customary administration presents a meaningful risk of unintended dosing, adverse effects such as hypotension, and patient confusion. The pharmacist should contact the prescriber to confirm that every-eight-hours administration was intended and document the clarification before the prescription is filled. Pharmacy technicians support this safe prescription-processing workflow by identifying incomplete, unusual, or potentially erroneous prescription information and referring it to the pharmacist for resolution. See the FDA-approved lisinopril prescribing information and the PTCB CPhT program details for the role of safe prescription processing.

QUESTION NO: 35

ReconstitutedArexvymust be discarded if it is not used within a maximum of:

A. 30 minutes

B. 4 hours

C. 24 hours

D. 1 week

ANSWER: B

Explanation:

4 hours is correct. AREXVY is supplied as separate components that must be reconstituted before administration. Following reconstitution, the vaccine has a limited beyond-use time because its labeled stability is only supported for a short period under specified storage conditions. The U.S. prescribing information directs vaccinators to administer the reconstituted vaccine as soon as possible and, when it is not used immediately, to store it at refrigerated temperatures of 2°C to 8°C (36°F to 46°F). It must be discarded if not used within 4 hours after reconstitution. This time limit helps ensure that the administered dose remains within the manufacturer-supported standards for quality, potency, and safety. Pharmacy personnel should document the reconstitution time, maintain the required refrigerator temperature if the dose is not given immediately, and discard any remaining reconstituted vaccine once the 4-hour limit is reached. This is a product-specific handling requirement, so it should be followed even if other vaccines have different post-reconstitution time limits. The current FDA-approved prescribing information is available through FDA AREXVY Prescribing Information. Additional storage and handling principles for vaccines are available in the CDC's Vaccine Storage and Handling Toolkit.

QUESTION NO: 36

What is the primary function / use for Rosiglitazone?

A. Anti-Convulsant

B. Hypertension

C. Anti-Diabetic

D. Proton Pump Inhibitor

ANSWER: C

Explanation:

Rosiglitazone is an **anti-diabetic** medication used, along with diet and exercise, to improve glycemic control in adults with type 2 diabetes mellitus. It belongs to the thiazolidinedione drug class and works as an agonist of peroxisome proliferator-activated receptor gamma (PPAR-γ). Activating this receptor increases the body's sensitivity to insulin in adipose tissue, skeletal muscle, and the liver. This helps insulin work more effectively to lower elevated blood glucose levels. Rosiglitazone is intended for type 2 diabetes and does not replace insulin therapy for type 1 diabetes or diabetic ketoacidosis. Pharmacy technicians should recognize the "-glitazone" drug-name stem as commonly associated with thiazolidinedione antidiabetic agents. Because rosiglitazone has clinically important safety considerations, including a boxed warning for congestive heart failure risk, prescriptions and patient counseling should be handled according to current labeling and pharmacy procedures. The FDA-approved prescribing information identifies rosiglitazone as an adjunct to diet and exercise for improving glycemic control in adults with type 2 diabetes mellitus. See the FDA prescribing information for AVANDIA (rosiglitazone) and MedlinePlus drug information for rosiglitazone.

QUESTION NO: 37

Which FDA recall is the least severe?

A. Class IV

B. Class III

C. Class II

D. Class I

ANSWER: B

Explanation:

Class III is the least severe FDA recall classification. The FDA assigns recall classifications according to the health hazard presented by the recalled product and the likelihood that use of, or exposure to, the product will cause adverse health consequences. A Class III recall is used when use of or exposure to a violative product is not likely to cause adverse health consequences. In pharmacy practice, this classification may apply to issues that violate FDA requirements but are unlikely to harm a patient, such as certain labeling or packaging deviations that do not create a meaningful clinical risk. Recall classifications help pharmacies and other healthcare entities prioritize response activities, including identifying affected inventory, segregating products, notifying appropriate personnel, and following the manufacturer's recall instructions. The classification describes the relative health risk associated with the recalled product; it does not eliminate the need to promptly comply with recall procedures. The FDA recognizes three recall classifications, with Class III representing the lowest level of health hazard. See the FDA's Industry Guidance for Recalls and its Recalls, Market Withdrawals, and Safety Alerts information.

QUESTION NO: 38

A prescription foracetaminophen 325 mg tabletswas inadvertently filled withacetaminophen 500 mg tablets, but the verifying pharmacist caught and corrected the mistake before dispensing. It would be most appropriate to report this situation as a(n):

A. Near miss.

B. Adverse drug reaction.

C. Drug allergy.

D. Sentinel event.

ANSWER: A

Explanation:

Near miss. is the appropriate classification because an incorrect medication strength was selected during the filling process but the discrepancy was detected by the verifying pharmacist and corrected before the prescription was dispensed to the patient. In medication-safety terminology, a near miss is an error or event that could have caused patient harm but did not reach the patient because it was intercepted in time. Reporting near misses is an important part of a pharmacy's quality-improvement and medication-error-prevention program. These reports can reveal contributing factors, such as look-alike packaging, workflow interruptions, barcode-scanning gaps, or storage practices that make strength-selection errors more likely. The pharmacy can then implement safeguards to reduce the likelihood of a similar error reaching a patient in the future. The Institute for Safe Medication Practices emphasizes learning from errors and hazards, including those caught before they affect a patient, as part of building safer medication-use systems. The National Coordinating Council for Medication Error Reporting and Prevention similarly identifies errors that are detected before reaching the patient as circumstances requiring no patient harm, consistent with a near miss. See ISMP guidance on reporting medication errors and the NCC MERP medication-error taxonomy.

QUESTION NO: 39

Convert the Celsius temperature of 100 degrees into degrees Fahrenheit.

A. 212

ANSWER: A

Explanation:

212 is correct. To convert a temperature from degrees Celsius to degrees Fahrenheit, use the formula °F = (°C × 9/5) + 32. Substituting 100 for the Celsius value gives (100 × 9/5) + 32. First, 100 multiplied by 9/5 equals 180. Adding 32 results in 212°F. This conversion is especially relevant in pharmacy practice because temperature requirements for medication storage, handling, and compounding may be expressed in either Celsius or Fahrenheit. For example, a temperature of 100°C is also the boiling point of water at standard atmospheric pressure, which corresponds to 212°F. Accurate temperature conversion supports proper interpretation of product labeling, equipment settings, and procedural instructions. The National Institute of Standards and Technology provides reference information on temperature scales and unit conversions at NIST: SI Units—Temperature. A Celsius-to-Fahrenheit conversion reference is also available from the U.S. National Weather Service at National Weather Service: Temperature Conversion.

QUESTION NO: 40

You have been asked to dilute and repackage 1 Liter of a 20% solution into 1 pint bottles of 5% solution. How many bottles will you be able to fill?

A. 8

B. 4

C. 10

D. 5

ANSWER: A

Explanation:

8 is correct. This dilution is solved using the concentration-volume relationship: initial concentration × initial volume = final concentration × final volume. Starting with 1 L of a 20% solution and diluting it to 5% gives a final volume of 4 L: (20% × 1 L) ÷ 5% = 4 L. The added diluent changes the total volume but does not change the amount of drug present.

Next, convert the final volume to the bottle size. A U.S. liquid pint equals approximately 473 mL (0.473 L), so 4 L contains about 8.45 pints. Because the question asks how many 1-pint bottles can be filled, only complete bottles count. Therefore, eight bottles can be filled, with some diluted solution remaining after those bottles are filled. This calculation follows the standard pharmacy-technique approach of calculating the total final volume after dilution and then dividing by the package volume. The pint conversion is supported by the National Institute of Standards and Technology unit-conversion guidance, and dilution calculations are consistent with the compounding principles described in FDA compounding information.

QUESTION NO: 41

Which type of insulin has the shortest onset period (the length of time before it reaches the bloodstream and begins to lower blood sugar).

A. Ultra-Lente

B. Lente

C. NPH

D. Regular

ANSWER: D

Explanation:

Regular is correct. In the traditional insulin categories represented in this question, regular insulin is classified as short-acting insulin and has the fastest onset. After subcutaneous administration, its glucose-lowering action generally begins in approximately 30 minutes, although individual timing can vary with dose, injection site, blood flow, physical activity, and other clinical factors. This onset profile is why regular insulin is commonly scheduled about 30 minutes before a meal: beginning its action near mealtime helps limit the rise in blood glucose associated with carbohydrate intake.

For a pharmacy technician, recognizing regular insulin as a short-acting product supports safe prescription processing, appropriate patient-facing reinforcement of the labeled timing instructions, and awareness that insulin products are not automatically interchangeable. Product-specific administration directions should always be followed, since onset, peak, and duration help determine how an insulin is matched to meals and a patient's glucose-management plan. The FDA prescribing information for Humulin R identifies it as human insulin and provides administration and pharmacodynamic information, while the American Diabetes Association provides patient education on insulin use and timing. See the FDA Humulin R prescribing information and the American Diabetes Association's insulin basics.

QUESTION NO: 42

A patient package insert (PPI) is required for which of the following medications?

A. Androgens

B. Oral contraceptives

C. Corticosteroids

D. Oral chemotherapy

ANSWER: B

Explanation:

Oral contraceptives is correct because federal regulations specifically require an FDA-approved patient package insert to accompany prescription oral contraceptive drug products. The PPI is standardized FDA-required patient labeling designed to provide understandable directions and safety information, including how to use the product, contraindications, warnings, what to do when doses are missed, and when to seek medical advice. In the outpatient setting, the PPI must be dispensed with each prescription and refill. In an institutional setting, it must be provided before administration of the first dose and then at least every 30 days if therapy continues. This is a distinct regulatory labeling requirement that pharmacy technicians should recognize when preparing and dispensing oral contraceptive prescriptions. The governing rule is found in 21 CFR 310.501, which describes the requirement and content for patient package inserts for oral contraceptives. FDA also maintains a separate PPI requirement for estrogen-containing drug products under 21 CFR 310.515. These regulations support safe medication use by ensuring patients receive essential product-specific information directly with these therapies. See 21 CFR 310.501 and 21 CFR 310.515.

QUESTION NO: 43

Which of the following word roots is paired correctly with its meaning?

A. Bucc/o – joint

B. Arteri/o – watery

C. Encephal/o – intestines

D. Adip/o – fat

ANSWER: D

Explanation:

Adip/o – fat is the correctly paired medical word root. The combining form *adip/o* refers to fat or fatty tissue and appears in terms related to the storage, metabolism, and pathology of body fat. For example, adipose tissue is connective tissue

specialized for storing fat, and adipocyte refers to a cell that stores fat. Recognizing this root helps pharmacy technicians interpret medication information, disease states, and clinical documentation involving body composition and metabolic conditions. Medical terminology often combines a root with a connecting vowel and a suffix to form a complete term; therefore, *adip/o* may be seen in several related forms while consistently retaining its association with fat. Accurate recognition of common roots is important in pharmacy practice because prescriptions, patient profiles, package inserts, and communications from other health care professionals may contain terminology built from these components. A reliable medical terminology reference defines the combining form adip/o as fat: The Free Dictionary: adipo-. The National Cancer Institute also defines adipose tissue as a type of tissue in which fat is stored: NCI Dictionary of Cancer Terms: adipose tissue.

QUESTION NO: 44

Vistarilis a brand name for:

A. Prochlorperazine

B. Meclizine

C. Ranolazine

D. Hydroxyzine

ANSWER: D

Explanation:

Hydroxyzine is correct because Vistaril is a brand name for hydroxyzine pamoate, a first-generation antihistamine. In pharmacy practice, recognizing this brand–generic association is important for accurately processing prescriptions, selecting the appropriate medication, and counseling workflow. Hydroxyzine is used for symptomatic relief of anxiety and tension, management of pruritus associated with allergic conditions, and as a sedative when used as premedication for anesthesia. The Vistaril product labeling identifies hydroxyzine pamoate as its active ingredient; hydroxyzine is also available in other formulations, including hydroxyzine hydrochloride. Pharmacy technicians should verify the prescribed product's strength, dosage form, route, and the specific salt formulation when entering or filling an order, since products may be stocked under either generic or brand names. Authoritative drug information for hydroxyzine is available from MedlinePlus, and the FDA-approved Vistaril prescribing information is available through FDA Drugs@FDA.

QUESTION NO: 45

A CII drug can be refilled?

A. A new prescription is needed for each prescription refill

ANSWER: A

Explanation:

A new prescription is needed for each prescription refill is correct. Under the federal Controlled Substances Act and DEA regulations, Schedule II controlled-substance prescriptions may not be refilled. Once the quantity authorized on a Schedule II prescription has been dispensed, the patient needs a new prescription from an authorized prescriber before additional medication can be dispensed. This rule applies to Schedule II medications because they have a high potential for misuse and dependence, so dispensing is subject to especially strict controls.

A prescriber may, when clinically appropriate and permitted by applicable law, issue multiple separate Schedule II prescriptions on the same date that collectively authorize up to a 90-day supply. Each prescription must be issued for a legitimate medical purpose, include all required information, and contain instructions specifying the earliest date on which it may be filled when it is not intended for immediate dispensing. These are separate prescriptions, not refills. Pharmacy technicians should recognize that a request for another supply after a Schedule II prescription is fully dispensed requires a new prescription order and must be handled according to federal requirements and any stricter state laws. See the DEA's 21 CFR § 1306.12 and the DEA's controlled-substance refill guidance.

QUESTION NO: 46

DEA Form 41 would be most appropriate to complete when destroying expired:

A. Nonsteroidal anti-inflammatories.

B. Opioid analgesics.

C. Penicillin antibiotics.

D. Monoclonal antibodies.

ANSWER: B

Explanation:

Opioid analgesics are the best answer because many opioids, including hydrocodone, oxycodone, morphine, and fentanyl, are controlled substances under the Controlled Substances Act. Expired controlled substances require disposal through a process that complies with DEA requirements and creates the required accountability records. DEA Form 41, titled "Registrants Inventory of Drugs Surrendered," is associated with documenting controlled substances surrendered to the DEA for destruction and remains a commonly tested pharmacy-technician form for controlled-substance disposal scenarios.

In current practice, a registrant generally transfers pharmaceutical controlled substances for destruction to an authorized reverse distributor or another authorized person, and must maintain a record of the transfer and destruction. The DEA's regulations require a complete and accurate record for controlled substances destroyed by a registrant, including the substance, quantity, date, and method of destruction. Therefore, when a question asks which type of expired medication most appropriately triggers DEA controlled-substance destruction documentation, opioid analgesics is the appropriate selection. See the DEA's 21 CFR § 1304.21 destruction-record requirements and its DEA Form 41 instructions.

QUESTION NO: 47

Which of the following medications is subject to a Risk Evaluation and Mitigation Strategy (REMS) program?

A. Clotrimazole

B. Amitriptyline

C. Tamsulosin

D. Isotretinoin

ANSWER: D

Explanation:

Isotretinoin is subject to the FDA-required iPLEDGE Risk Evaluation and Mitigation Strategy (REMS). Isotretinoin is highly teratogenic: exposure during pregnancy can cause severe, life-threatening birth defects. The iPLEDGE program is intended to prevent fetal exposure by requiring specific safety steps before and during treatment. These controls include enrollment of prescribers, pharmacies, wholesalers, and patients in the program; patient counseling about pregnancy risks; documented pregnancy testing for patients who can become pregnant; and verification of the applicable REMS requirements before isotretinoin can be dispensed. Pharmacy personnel play an important role by ensuring the prescription is processed through the authorized iPLEDGE system and that dispensing occurs only after the required authorization is obtained. The FDA identifies iPLEDGE as the REMS for isotretinoin products, and the program materials emphasize that no pregnancy is acceptable while using isotretinoin because of the drug's profound fetal risk. This medication is therefore a key REMS-associated drug for pharmacy technicians to recognize. See the FDA's REMS database and the official iPLEDGE REMS website.

QUESTION NO: 48

Which drug is not DEA controlled?

A. Phentermine

B. Prozac

C. Lunesta

D. Valium

ANSWER: B

Explanation:

Prozac is the correct answer because it is the brand name for fluoxetine, a selective serotonin reuptake inhibitor used primarily to treat depression, obsessive-compulsive disorder, panic disorder, and certain eating disorders. Fluoxetine is a prescription-only medication, but it is not listed as a controlled substance under the federal Controlled Substances Act and therefore does not have a DEA schedule. A prescription is still required because fluoxetine has clinically significant effects, potential adverse reactions, drug interactions, and monitoring considerations; however, prescription status alone does not make a medication DEA controlled. DEA scheduling is reserved for drugs or substances that have recognized abuse potential and are placed in Schedules I through V. For pharmacy practice, this distinction affects such tasks as controlled-substance inventory, storage, recordkeeping, refill limits, and transfer rules. Fluoxetine should be processed using the applicable rules for a noncontrolled legend prescription while still following state law, payer requirements, and the prescriber's directions. The official Prozac labeling identifies fluoxetine as its active ingredient, and the DEA provides the federal framework for controlled-substance schedules. See the DailyMed Prozac drug label and the DEA drug scheduling information.

QUESTION NO: 49 - (SIMULATION)

SIMULATION Sexual Dysfunction is not a side effect of ____.

ANSWER: See the explanation for the answer

Explanation:

Answer: bupropion (Wellbutrin).

Unlike SSRIs and many other antidepressants, bupropion is not typically associated with sexual dysfunction. It may be selected when a patient has sexual adverse effects from an SSRI.

QUESTION NO: 50

The Sig for "Right Ear" is:

A. AD

B. AU

C. AR

D. AS

ANSWER: A

Explanation:

AD is the traditional prescription abbreviation for *auris dextra*, Latin for "right ear." In a medication's Sig (directions for use), this abbreviation identifies the intended ear for an otic preparation, such as ear drops or an ear suspension. For example, directions stating "instill 4 drops AD twice daily" mean that four drops should be placed in the patient's right ear two times each day. Correct interpretation of site-of-administration abbreviations is important because many otic products are intended to be used only in the specified ear, and the pharmacy technician must accurately enter, prepare, and communicate the

prescription directions under pharmacist supervision. Medical and prescription-abbreviation references list *AD* as the abbreviation for the right ear. Although electronic prescribing and patient-facing labels commonly use plain language such as “right ear” to reduce ambiguity, recognizing AD remains relevant when reading prescriptions, medication orders, and historical pharmacy records. See the Merck Manual’s prescription-abbreviation reference and the Institute for Safe Medication Practices abbreviation guidance.

QUESTION NO: 51

Due to a drug-drug interaction, patients taking tetracycline should avoid simultaneous use of:

A. antacids that contain calcium.

B. decongestants that contain pseudoephedrine.

C. antitussives that contain dextromethorphan.

D. analgesics that contain acetaminophen.

ANSWER: A

Explanation:

Antacids that contain calcium are correct because calcium can bind with tetracycline in the gastrointestinal tract, producing a poorly absorbed chelate complex. This interaction substantially decreases the amount of tetracycline that reaches systemic circulation and can reduce the antibiotic’s therapeutic effectiveness. This is clinically important because inadequate antibiotic exposure may lead to unsuccessful treatment of the infection. Calcium-containing products are not limited to antacids; calcium supplements and dairy products may cause a similar absorption problem. Other polyvalent minerals, particularly magnesium, aluminum, iron, and zinc, can also interfere with absorption through the same chelation mechanism. Patients should be counseled to separate tetracycline from calcium-containing antacids and mineral products rather than taking them at the same time. Exact spacing instructions can vary by the particular tetracycline product and prescriber’s directions, but avoiding concurrent administration is essential. Taking tetracycline with a full glass of water also supports safe administration and helps reduce esophageal irritation. The FDA-approved tetracycline labeling specifically warns that absorption is impaired by antacids containing calcium, magnesium, or aluminum, as well as iron-containing preparations. See the FDA tetracycline label and NCBI StatPearls: Tetracycline.

QUESTION NO: 52

Which of the following medications should be dispensed with a calibrated oral syringe?

A. Enoxaparin sodium

B. Albuterol/ipratropium

C. Lorazepam concentrate

D. Polyethylene glycol 3350

ANSWER: C

Explanation:

Lorazepam concentrate is the appropriate selection because it is a concentrated oral liquid that requires highly accurate volume measurement. The commonly marketed oral concentrate contains 2 mg of lorazepam per mL, so even a small volume-measurement error can substantially change the dose received. A calibrated oral dosing device, such as an oral syringe, enables the patient or caregiver to measure the prescribed amount in milliliters precisely and helps avoid confusion with household teaspoons or other nonstandard devices. This is especially important when small doses are prescribed, including doses that may be used for older adults or patients who need individualized dosing. The product labeling directs patients to use the calibrated measuring device supplied with the concentrate and to dilute the measured dose in an appropriate liquid or soft food immediately before administration. Pharmacy personnel should ensure that the dispensing container includes an appropriate calibrated device and that the patient understands the prescribed mL dose and dilution

directions. The FDA also recommends using oral syringes for small-volume liquid doses because they provide clear, metric measurement and improve dosing accuracy. See the DailyMed lorazepam oral concentrate labeling and the FDA's guidance on using oral syringes properly.

QUESTION NO: 53

Which drug would be used for athletes' foot?

A. Ranitidine

B. Fluconazole

C. Tamsulosin

D. Sildenafil

ANSWER: B

Explanation:

Fluconazole is the correct choice because athlete's foot, also called tinea pedis, is a fungal infection of the skin of the feet. Fluconazole is an azole antifungal medication that interferes with fungal cell-membrane formation, allowing it to treat susceptible dermatophyte infections. Although uncomplicated athlete's foot is often managed initially with a topical antifungal, oral fluconazole may be used when infection is extensive, recurrent, resistant to topical treatment, or when a clinician determines that systemic treatment is appropriate. The U.S. prescribing information for fluconazole includes dermal fungal infections such as tinea pedis among infections for which it may be used when systemic therapy is indicated. Pharmacy technicians should recognize the connection between drug class and condition: medications ending in "-azole" commonly include antifungal agents, and fluconazole is a well-known example. Counseling and treatment selection should still follow the pharmacist's and prescriber's directions, including attention to duration of therapy, drug interactions, and whether topical treatment is sufficient. See the DailyMed fluconazole prescribing information and the CDC overview of athlete's foot.

QUESTION NO: 54

Your retail pharmacy sells products at: 45% markup over wholesale + a set dispensing fee of $4. A customer brings in a script for: Vardenafil 5mg #10. The total retail cost at pickup for the 10 tablets is $149.00. What is your pharmacy's wholesale cost per/each tablet?

A. $14.50

B. $10.00

C. $18.85

D. $14.90

ANSWER: B

Explanation:

$10.00 is correct. The stated $149.00 pickup price includes both the drug's marked-up cost and the fixed $4.00 dispensing fee. First, remove the dispensing fee: $149.00 − $4.00 = $145.00. This is the retail drug charge before the fee. A 45% markup means the retail drug charge equals 145% of the wholesale drug cost, or wholesale cost multiplied by 1.45. Therefore, the wholesale cost for all 10 tablets is $145.00 ÷ 1.45 = $100.00. Finally, divide the total wholesale cost by the quantity dispensed: $100.00 ÷ 10 tablets = $10.00 per tablet. This calculation properly treats the dispensing fee as a separate fixed charge rather than applying the markup to it. Markup calculations use the original wholesale amount as the base; a 45% markup adds 45 cents for every wholesale dollar, producing a retail multiplier of 1.45. For additional background on percent and markup calculations, see OpenStax Contemporary Mathematics: Percent and Consumer Financial Protection Bureau: Markup.

QUESTION NO: 55

Desvenlafaxineis indicated to treat:

A. Hypertension

B. Major depressive disorder

C. Benign prostatic hypertrophy

D. Atrial fibrillation

ANSWER: B

Explanation:

Desvenlafaxine is indicated for the treatment of major depressive disorder in adults. It is a serotonin-norepinephrine reuptake inhibitor, commonly called an SNRI. This drug class increases serotonin and norepinephrine signaling in the central nervous system, neurotransmitters involved in mood regulation. In the United States, desvenlafaxine is marketed under the brand name Pristiq and is available as an extended-release tablet. Pharmacy technicians should recognize major depressive disorder as the core labeled indication when processing prescriptions, selecting medication information, and assisting with medication-related workflow under pharmacist supervision.

The FDA-approved prescribing information identifies treatment of major depressive disorder as desvenlafaxine's indication. The product labeling also emphasizes that the tablet should be swallowed whole and that treatment requires monitoring for clinically important safety considerations, including suicidal thoughts and behaviors, particularly when therapy is started or doses are changed. Knowing the indication helps a technician connect a medication's therapeutic class with its intended use and supports accurate prescription processing. See the FDA Prescribing Information for Pristiq and the MedlinePlus desvenlafaxine drug information.

QUESTION NO: 56

Drowsinessis a common side effect of:

A. Xarelto

B. Bystolic

C. Dexilant

D. Lyrica

ANSWER: D

Explanation:

Lyrica is correct because it is the brand name for pregabalin, a medication used for certain neuropathic pain conditions, fibromyalgia, and as adjunctive therapy for partial-onset seizures. Pregabalin acts on calcium-channel subunits in the central nervous system, which can reduce abnormal nerve signaling but may also produce central nervous system effects such as dizziness and somnolence (drowsiness). These effects are common enough to be specifically highlighted in the prescribing information and are important counseling points for pharmacy technicians to recognize. Patients beginning therapy or receiving a dosage increase may be especially affected. They should be advised to avoid driving, operating machinery, or performing other potentially hazardous activities until they know how pregabalin affects them. Drowsiness can be intensified by alcohol and by other medications that depress the central nervous system, including opioids, benzodiazepines, and sedating antihistamines. The FDA-approved labeling identifies dizziness and somnolence among pregabalin's most common adverse reactions: FDA Lyrica prescribing information. Additional patient-focused safety information is available from MedlinePlus: Pregabalin.

QUESTION NO: 57

A package with the NDC: 76439-103-10 contains the same medication as a package with which of the following NDCs?

A. 76439-208-10

B. 76439-103-50

C. 74693-103-10

D. 74693-206-50

ANSWER: B

Explanation:

76439-103-50 identifies the same medication because it retains the same labeler code and product code as 76439-103-10. In the FDA's traditional 10-digit NDC format, the first segment identifies the labeler, meaning the manufacturer, repackager, or distributor responsible for the product. The second segment is the product code, which identifies the specific drug product, including characteristics such as its active ingredient(s), strength, dosage form, and formulation. Together, 76439-103 identify the same labeled drug product.

The final segment is the package code. It distinguishes the particular package configuration or package size in which that product is supplied. Changing the final segment from 10 to 50 therefore indicates a different package of the same medication rather than a different medication. Pharmacy personnel use this distinction when interpreting stock bottles, selecting inventory, and validating product identifiers; the package quantity may vary while the underlying drug product remains unchanged. The FDA explains NDC segment roles and the relationship between product and package codes in its National Drug Code Directory and NDC Directory resources.

QUESTION NO: 58

A pharmacy receives a prescription for hydroxyzine 25 mg q6h for hypertension. The pharmacy technician should alert a pharmacist because:

A. hydroxyzine requires special handling

B. the prescription exceeds the maximum recommended daily dose.

C. the prescription appears to contain a look-alike sound-alike error.

D. hydroxyzine is subject to a REMS program.

ANSWER: C

Explanation:

The correct answer is *the prescription appears to contain a look-alike sound-alike error.* The prescribed drug and the documented indication do not align: hydroxyzine is a first-generation antihistamine with sedating properties, whereas hypertension is commonly treated with antihypertensive agents. In this context, the order may have intended hydralazine, a vasodilator used to treat hypertension. The names hydroxyzine and hydralazine are similar in spelling and pronunciation, creating a meaningful risk for a wrong-drug prescribing, transcription, or dispensing error.

A pharmacy technician should not independently alter the prescription or assume the intended medication. Instead, the technician should promptly bring the mismatch to the pharmacist's attention so the pharmacist can evaluate the order and, when appropriate, clarify it with the prescriber before dispensing. This is an important medication-safety safeguard because indication-based checks can identify errors that might otherwise reach the patient. Hydroxyzine product labeling identifies antihistamine-related uses, while hydralazine labeling identifies treatment of hypertension. ISMP also emphasizes managing look-alike/sound-alike medication-name risks through careful verification processes. See DailyMed: Hydroxyzine and ISMP Confused Drug Names List.

QUESTION NO: 59

A new product has arrived to your pharmacy. The storage requirements on the label read: Store at 1.5°C - 3.3°C. Where would you store them?

A. Room Temperature

B. Refrigerator

C. Freezer

D. Incubator

ANSWER: B

Explanation:

Refrigerator is correct because the manufacturer's labeled storage range of 1.5°C to 3.3°C is a cold-temperature range that must be maintained using refrigerated storage. Pharmacy personnel must follow the specific storage instructions on the product label, since those conditions are established from the manufacturer's stability data and are necessary to preserve the medication's identity, strength, quality, and purity through its expiration date. A pharmacy refrigerator that is appropriate for medication storage should be continuously monitored with a calibrated temperature-monitoring device, such as a digital data logger, so staff can verify that the product remains within its unusually narrow required range. Because this range begins slightly below the commonly cited refrigerated range, the pharmacy should confirm that the refrigerator's monitored temperatures can reliably stay between 1.5°C and 3.3°C and follow the pharmacy's procedures for temperature excursions. The product should also be kept in its original packaging when applicable and placed where air circulation allows stable temperature control. The FDA emphasizes that drug products should be stored under the conditions specified in their labeling, and CDC guidance similarly highlights the need for continuous temperature monitoring for refrigerated pharmaceutical products. See the FDA drug storage and shipping resources and the CDC Vaccine Storage and Handling Toolkit.

QUESTION NO: 60 - (SIMULATION)

SIMULATION A patient requests valid refills of a rabeprazole and albuterol inhaler. Which two medications should be filled?

ANSWER: See the explanation for the answer

Explanation:

Fill rabeprazole delayed-release tablets (Aciphex) and an albuterol HFA metered-dose inhaler (e.g., ProAir HFA).

Rabeprazole is the generic for **Aciphex**. The requested albuterol product is a rescue inhaler; select the prescribed/refill-authorized **albuterol HFA inhaler** (commonly ProAir HFA, Ventolin HFA, or Proventil HFA as permitted by the prescription and formulary).

QUESTION NO: 61

According to federal law, the transfer of an eligible Schedule III controlled substance prescription must be communicated directly between:

A. two licensed pharmacy technicians

B. a licensed pharmacy technician and a licensed pharmacist

C. a licensed pharmacist and a licensed nurse

D. two licensed pharmacists

ANSWER: D

Explanation:

The correct answer is **two licensed pharmacists**. Under federal DEA regulations, a prescription for a Schedule III, IV, or V controlled substance that is eligible for transfer must be transferred directly from one pharmacist to another pharmacist. The regulation specifically requires that the communicating parties be pharmacists; it does not authorize pharmacy technicians, nurses, or other personnel to send or receive the transfer communication. This requirement helps preserve the accuracy, accountability, and controlled-substance documentation required during the transfer process.

For a transferred prescription, the pharmacists must also create and retain specified records. The transferring pharmacist documents the transfer on the original prescription record, including the receiving pharmacy and pharmacist information and the date of transfer. The receiving pharmacist records that the prescription was transferred and documents the required original prescription and refill information. Federal rules generally permit a one-time transfer, although pharmacies that share a real-time, online database may transfer refills up to the maximum number authorized by the prescriber and permitted by law. These procedures apply only to transferable Schedule III–V prescriptions with refills remaining. See 21 CFR § 1306.25 and the DEA's Pharmacist's Manual.

QUESTION NO: 62

How many teaspoons are in one ounce?

A. 2

B. 3

C. 6

D. 8

ANSWER: C

Explanation:

6 is correct because the standard pharmacy household-volume conversion is 1 fluid ounce = 6 teaspoons. This relationship follows the commonly used approximations of 1 fluid ounce = 30 mL and 1 teaspoon = 5 mL. Dividing 30 mL by 5 mL per teaspoon gives 6 teaspoons. Pharmacy technicians need to recognize this conversion when interpreting prescriptions, preparing nonsterile liquid medications, and communicating dosing information that uses household units. Although metric units are preferred for measuring and administering oral liquids because they reduce dosing ambiguity, household-unit conversions remain important for calculations and for understanding directions that may appear on prescriptions or product labeling. The U.S. customary fluid ounce is approximately 29.57 mL, which rounds to 30 mL for routine pharmacy calculations; therefore, the six-teaspoon conversion is the accepted practical value. NIST provides authoritative information on U.S. customary and metric measurement relationships in its SI Units and Measurement Resources. Guidance on using metric units for oral liquid medicines is also available from the FDA.

QUESTION NO: 63

A patient presents a prescription for Ibandronate 150mg #3. Your pharmacy has a 35% markup and $5.66 dispensing fee. The wholesale price is $15.70 per tab. What will the retail price be for this prescription of 3 tablets?

A. $63.59

B. $47.10

C. $52.76

D. $69.25

ANSWER: D

Explanation:

$69.25 is the correct retail price. Start by calculating the pharmacy's acquisition cost for the full quantity: 3 ibandronate tablets at $15.70 each equals $47.10. A 35% markup is calculated from this wholesale cost, so the markup amount is $47.10

× 0.35 = $16.485. Adding that amount to the wholesale cost gives a marked-up medication price of $63.585. The dispensing fee is then added separately: $63.585 + $5.66 = $69.245. Retail currency amounts are rounded to the nearest cent, making the final price $69.25.

This calculation uses the standard sequence for a prescription-pricing question when the stated percentage is a markup: determine the total drug cost for the dispensed quantity, add the percentage increase based on cost, then add the fixed dispensing fee. This type of calculation supports the pharmacy technician role in assisting with prescription processing and billing-related tasks, as reflected in the PTCB's description of pharmacy technician responsibilities and examination content. See the PTCE Content Outline and the PTCB Certified Pharmacy Technician overview.

QUESTION NO: 64

Federal law restricts the OTC sale of:

A. Loratadine

B. Pseudoephedrine

C. Acetaminophen

D. Naproxen

ANSWER: B

Explanation:

Pseudoephedrine is correct because federal law places specific retail-sale restrictions on this nonprescription decongestant due to its potential diversion for illicit methamphetamine production. The Combat Methamphetamine Epidemic Act requires pharmacies and other regulated sellers to keep pseudoephedrine products in a secure location, such as behind the pharmacy counter or in a locked cabinet, rather than allowing unrestricted customer access. At the point of sale, the purchaser must present acceptable identification, and the seller must record the transaction in a logbook or electronic record. Federal purchase limits also apply: an individual may buy no more than 3.6 grams of pseudoephedrine base per day and 9 grams per 30-day period from retail outlets. Pharmacy technicians may assist with these sales only according to pharmacy policy and applicable state law, while ensuring the required documentation and limits are followed. These requirements apply even though pseudoephedrine is available without a prescription; it is commonly described as "behind-the-counter" rather than as an unrestricted OTC product. The U.S. Food and Drug Administration summarizes these retail controls at FDA: Legal Requirements for Pseudoephedrine Sales. Statutory requirements are also available through Public Law 109-177, Combat Methamphetamine Epidemic Act provisions.

QUESTION NO: 65

When assisting a pharmacist in monitoring patient laboratory data, it would be appropriate for a pharmacy technician to:

A. Determine medication dosages.

B. Report out-of-range values.

C. Identify potential drug interactions.

D. Recommend diagnostic tests.

ANSWER: B

Explanation:

Report out-of-range values is appropriate because pharmacy technicians can support pharmacists by collecting, documenting, and communicating patient-specific information, including laboratory results. A technician who notices that a reported value falls outside the reference range should promptly relay that factual information to the pharmacist according to the pharmacy's procedures. This helps ensure the pharmacist is alerted to data that may require professional assessment while preserving the pharmacist's responsibility for interpreting clinical significance and determining any necessary action.

Laboratory monitoring is often essential to safe medication use; for example, medication therapy may require review of renal function, blood counts, or drug concentrations. The technician's role in this process is administrative and communicative: accurately obtain the value from an authorized source, enter or transmit it correctly when permitted by workflow, protect patient confidentiality, and notify the pharmacist of relevant results or missing information. The pharmacist then evaluates the laboratory result in the context of the patient's medication regimen and clinical condition. This division of responsibilities aligns with the Pharmacy Technician Certification Board's description of technician duties involving information collection and communication under pharmacist supervision and ASHP's pharmacy technician model curriculum. See the PTCB Certification Exam Content Outline and ASHP Model Curriculum for Pharmacy Technician Education and Training Programs.

QUESTION NO: 66

Carvedilolmay be a suitable therapeutic substitution for:

A. Albuterol

B. Labetalol

C. Tramadol

D. Estradiol

ANSWER: B

Explanation:

Carvedilol may be a suitable therapeutic substitution for **Labetalol** because both medications block beta-adrenergic receptors and also have alpha-1 blocking activity. This combined adrenergic blockade lowers blood pressure by reducing heart rate and cardiac workload while promoting vasodilation. Both drugs are used in the management of hypertension, so a prescriber may select carvedilol when a medication with a similar pharmacologic profile is clinically appropriate. Carvedilol also has an FDA-approved role in chronic heart failure with reduced ejection fraction, where it can improve outcomes when used as part of guideline-directed therapy. Therapeutic substitution is not an automatic interchange: the pharmacist must follow the prescriber's order, applicable protocol, and state law, and should recognize that dosing, indications, patient comorbidities, and monitoring needs differ between products. For example, heart rate, blood pressure, symptoms of dizziness, and signs of fluid retention should be monitored when beta-blocker therapy is initiated or adjusted. The FDA prescribing information describes carvedilol's alpha- and beta-adrenergic receptor-blocking actions and its approved cardiovascular uses. See the FDA carvedilol prescribing information and the NCBI StatPearls review of carvedilol.

QUESTION NO: 67

St. John's Wort is primarily used as a(n):

A. immune enhancer

B. mild antidepressant

C. antioxidant

D. antihypertensive

ANSWER: B

Explanation:

mild antidepressant is correct because St. John's wort (*Hypericum perforatum*) is an herbal product most commonly taken for symptoms of mild to moderate depression. Its active constituents, including hyperforin and hypericin, are believed to affect neurotransmitter signaling pathways involved in mood regulation. Some studies have found that certain standardized St. John's wort preparations may improve depressive symptoms in people with mild or moderate depression, although product formulations vary and the evidence is not sufficiently consistent to establish it as a substitute for prescribed depression treatment.

In pharmacy practice, it is especially important to recognize this product's intended mood-related use because it can cause clinically significant drug interactions. St. John's wort induces metabolic enzymes and transport proteins, particularly CYP3A4 and P-glycoprotein, which can reduce exposure to many medications. Patients using prescription therapy should consult a pharmacist or prescriber before starting it. It also should not be combined casually with serotonergic medications because of the potential for excessive serotonin activity. The National Center for Complementary and Integrative Health summarizes its common use and safety considerations at NCCIH: St. John's Wort and Depression. Additional interaction guidance is available from NCCIH: St. John's Wort.

QUESTION NO: 68

Which of the following should be used tohelp incorporate a solid (like powder) into an ointmentduringnonsterile compounding?

A. Emulsifying agents

B. Diluents

C. Levigating agents

D. Preservatives

ANSWER: C

Explanation:

Levigating agents are used when a powdered solid must be smoothly incorporated into an ointment base during nonsterile compounding. Levigation is the process of triturating an insoluble powder with a small amount of an appropriate liquid, called a levigating agent, to form a smooth paste before gradually mixing it into the base. This step reduces grittiness, improves dispersion of the particles, and promotes a more uniform final preparation. The selected levigating agent must be compatible with both the drug substance and the ointment base. For example, mineral oil is commonly suitable for oleaginous ointment bases, while glycerin or propylene glycol may be suitable for water-miscible or hydrophilic systems. Proper levigation is particularly important for topical products because large or poorly dispersed particles can produce an uneven dose and an unacceptable texture. The technique supports the quality expectations for nonsterile compounded preparations by helping achieve a uniform, elegant, and usable dosage form. USP's nonsterile compounding chapter describes the standards that apply to preparing such formulations, and pharmacy-compounding training materials discuss levigation as a standard method for incorporating insoluble powders into semisolid bases. See USP General Chapter <795> Pharmaceutical Compounding—Nonsterile Preparations and NCBI Bookshelf: Extemporaneous Compounding.

QUESTION NO: 69

What is the strength of a 1:50 solution of neomycin sulfate?

A. 2%

B. 10%

C. 20%

D. 50%

ANSWER: A

Explanation:

The correct strength is **2%**. For a solid ingredient such as neomycin sulfate dissolved in a liquid, a ratio strength of 1:50 is interpreted as 1 g of drug in each 50 mL of final solution, which is a weight-in-volume ratio. Percent strength expresses the number of grams present in 100 mL. Set up the conversion by multiplying the ratio fraction by 100: (1 ÷ 50) × 100 = 2. Therefore, the preparation contains 2 g per 100 mL, or 2% w/v. This conversion is useful in pharmacy calculations because ratio strengths are commonly encountered on product labels and in compounding, while percentage strengths are often needed for dose, quantity, and concentration calculations. The United States Pharmacopeia describes percentage

expressions for concentrations and recognizes weight-in-volume conventions for solids dissolved in liquids. Pharmacy technicians should retain the final unit context: the calculated 2% is specifically 2% w/v, even when an answer choice displays only “2%.” For additional concentration-expression guidance, see the United States Pharmacopeia and the FDA’s Drugs@FDA data resources.

QUESTION NO: 70

According to theFDA,heparin strength per total volumeshould be the primary and prominent expression on the manufacturerâ€™s label, followed by the:

A. Percentage weight per volume

B. Volume per total strength

C. Strength per mL enclosed in parentheses

D. mL per dose enclosed in parentheses

ANSWER: C

Explanation:

Strength per mL enclosed in parentheses is correct because the FDA’s recommended heparin-container labeling format presents the total amount of heparin in the entire container as the most prominent expression, followed by the concentration per milliliter in parentheses. For example, a 10 mL vial containing 10,000 units would be labeled primarily as “10,000 units/10 mL,” with “(1,000 units/mL)” following it. This arrangement helps clinicians recognize the total quantity of drug available in the vial before calculating or withdrawing a dose.

Heparin products have historically been associated with serious medication errors when labels emphasized concentration alone, particularly when vials with different total amounts looked similar. Making the strength per total volume prominent gives pharmacy personnel and other clinicians a clearer, standardized way to distinguish presentations during procurement, storage, dispensing, preparation, and final verification. The parenthetical per-milliliter expression remains useful for dose calculations and measuring the prescribed volume, but it is secondary to the total-container strength. This labeling convention is intended to reduce confusion and support safer medication-use processes for this high-alert anticoagulant. See the FDA’s heparin medication-error labeling recommendations and the Institute for Safe Medication Practices heparin safety recommendations.

QUESTION NO: 71

Stock rotation is best defined as the:

A. reordering of medications to generate greater turnover

B. removal of specific medications that are to be replaced with new product

C. number of times medications are purchased, sold, and replaced in any time period

D. placement of medications with later expiration dates behind those with earlier expiration dates

ANSWER: D

Explanation:

Stock rotation is the systematic arrangement of medications so that products with the earliest expiration dates are dispensed or used before products with later expiration dates. Therefore, *placement of medications with later expiration dates behind those with earlier expiration dates* correctly describes the shelf-placement practice used to support first-expired, first-out inventory control. When new stock is received, pharmacy personnel check expiration dates and place the longer-dated items behind existing stock with nearer expiration dates. This keeps the soonest-to-expire inventory accessible at the front and helps ensure it is selected first during routine dispensing. Proper stock rotation protects medication quality, reduces the likelihood that expired products remain in active inventory, and minimizes financial loss and waste from expired medication.

It is an ongoing inventory-management responsibility, performed when stock is received and during routine checks of medication storage areas. USP guidance on pharmacy storage emphasizes maintaining conditions and procedures that preserve product quality throughout storage and distribution. The FDA also advises checking expiration dates and not using medications beyond their expiration date, making an effective rotation process an important practical safeguard. See USP General Chapter <1079> Good Storage and Distribution Practices for Drug Products and FDA: Don’t Be Tempted to Use Expired Medicines.

QUESTION NO: 72

A lot number is used to track a medication ' s:

A. Therapeutic equivalence rating.

B. Controlled substance schedule.

C. Known drug-drug interactions.

D. Complete manufacturing history.

ANSWER: D

Explanation:

Complete manufacturing history. is correct because a lot number identifies a specific batch, or lot, of medication manufactured under substantially the same conditions. It is a core traceability identifier used by manufacturers, wholesalers, pharmacies, and regulators to connect a drug product to its production and quality-control documentation. Those records can include the manufacturing date, facility, processing conditions, testing results, packaging information, and the distribution path for that particular batch.

This tracking is especially important when a quality concern or recall arises. If a manufacturer identifies a defect, contamination risk, labeling problem, or other issue affecting a particular batch, the lot number enables pharmacies to determine whether they received or dispensed medication from the affected lot. Pharmacy personnel therefore use lot numbers when receiving inventory, rotating stock, responding to recalls, documenting returns, and quarantining products. A lot number does not identify the medication generally; rather, it identifies the particular manufacturing batch and supports investigation of that batch’s complete history.

The FDA describes drug recalls and the importance of identifying affected product lots in its industry guidance on recalls. Lot or control numbers are also required on drug-product labeling under 21 CFR § 201.18.