MULTIPLE CHOICE

1. By which of the following routes are drugs administered directly into the bloodstream?
   a. Enteral  
   b. Transdermal  
   c. Transmucosal  
   d. Intravenous  
   ANS: D  
   Parenteral drugs are injected or infused (slowly injected) directly into a blood vessel, muscle, skin, or joint. Parenterally administered drugs enter the bloodstream, producing rapid action.  
   DIF: Cognitive level 2: Comprehension  REF: pp. 13-14

2. Fentanyl is used as a _____.
   a. synthetic anesthetic  
   b. synthetic analgesic  
   c. natural analgesic  
   d. natural anesthetic  
   ANS: B  
   Fentanyl is a synthetically manufactured analgesic.  
   DIF: Cognitive level 2: Comprehension  REF: p. 5

3. To help reduce nausea, the natural drug _____ can be used.
   a. digitalis  
   b. peppermint  
   c. caffeine  
   d. quinine  
   ANS: B  
   Some common beverages and foods are natural drugs. Coffee and tea contain the drug caffeine. Ginger and peppermint contain ingredients that can reduce nausea.  
   DIF: Cognitive level 3: Application  REF: p. 5

4. Which of the following options results in an untrue statement about pharmacy technicians? Pharmacy technicians who possess a good knowledge of pharmacology understand the importance of _____.
   a. drug interactions  
   b. therapeutic duplication  
   c. lab values  
   d. excessive dose alerts  
   ANS: C  
   Knowledge of pharmacology facilitates selection of warning labels for drugs dispensed. Pharmacy technicians who possess a good knowledge of pharmacology understand the importance of recognizing drug interactions, therapeutic duplication, and excessive dose alerts screened by the computer.  
   DIF: Cognitive level 2: Comprehension  REF: p. 3

5. Which of the following was passed to protect the public from ineffective and harmful drugs and later expanded to standardize new drugs getting to market?
   a. Durham-Humphrey Amendment  
   b. Controlled Substance Act  
   c. Pure Food and Drug Act  
   d. Combat Methamphetamine Epidemic Act  
   ANS: C  
   In 1906, the Pure Food and Drug Act was passed to protect the public from ineffective and harmful drugs. This Act was expanded in 1938, and standards for allowing new drugs onto the market were set.  
   DIF: Cognitive level 2: Comprehension  REF: p. 6

6. Which of the following is the phase of the drug approval process that initially determines the safety and efficacy in those with the disease being studied?
   a. Phase 1  
   b. Phase 2  
   c. Phase 3  
   d. Phase 4  
   ANS: B  
   Phase 2 studies are controlled trials with a limited number of patients with the condition to be treated. During this phase, data are collected to determine the drug’s efficacy and the drug’s side effects in patients with the disease.  
   DIF: Cognitive level 2: Comprehension  REF: p. 7
7. Which of the following is the phase of the drug approval process that determines effectiveness of the drug in healthy volunteers?
   a. Phase 1
   b. Phase 2
   c. Phase 3
   d. Phase 4
   
   ANS: A
   In phase 1 clinical trials, the drug is administered to a small number of healthy volunteers who are enrolled in the clinical study. Preliminary information about the drug’s pharmacology, mechanism of action, and effectiveness in humans in a controlled clinical trial (efficacy) is gathered in phase 1.

8. One of the main purposes of drug therapy is to _____.
   a. analyze symptoms
   b. maintain side effects produced by drug therapy
   c. eradicate disease
   d. help cure disease
   
   ANS: D
   The aim of drug therapy is to diagnose, treat, cure, or lessen the symptoms of disease.

9. The drug approval process is a result of which of the following acts?
   a. Patent Restoration Act
   b. Pure Food, Drug, and Cosmetic Act
   c. Prescription Drug User Fee Act
   d. Drug Price Competition Act
   
   ANS: B
   In 1906, the Pure Food and Drug Act was passed to protect the public from ineffective and harmful drugs. This Act was expanded in 1938 and standards for allowing new drugs onto the market were set.

10. How does Combat Methamphetamine Epidemic Act (CMEA) of 2005 help deter the illegal manufacture of synthetic drugs?
    a. It has taken all ingredients that could be used to make illegal drugs off the market.
    b. It helps regulate controlled substances by placing them in various schedules based on abuse potential.
    c. It provides a provision to have certain products placed behind the counters out of general public reach.
    d. It has helped health care workers easily identify controlled substances by requiring identifying symbols on each of the drug labels.
    
    ANS: C
    The CMEA of 2005 was passed to curb the illegal manufacture and use of “crystal meth.” The CMEA was signed into law on March 6, 2006, to regulate, among other things, retail over-the-counter sales of ephedrine, pseudoephedrine, and phenylpropanolamine products used to manufacture crystal meth. Purchase limits, placement of product out of direct customer access, sales logbooks, customer ID verification, employee training, and self-certification of regulated sellers are required provisions of the CMEA.

11. Which step is not part of the drug development process?
    a. Clinical research
    b. Clinical studies
    c. New drug application process
    d. Marketing
    
    ANS: D
    There are many steps in the drug development process. The steps from the test tube to production and distribution of a new drug involve preclinical research, clinical studies, a new drug application process, and review.

12. The proprietary name of a drug is assigned by the _____.
    a. manufacturer
    b. CDER Labeling and Nomenclature Committee
    c. New Drug Application reviewer
    d. FDA
    
    ANS: A
    The proprietary name or brand name is assigned by the drug manufacturer according to nomenclature guidelines and must be approved by the CDER.
13. Why must a customer go to the pharmacy to purchase pseudoephedrine?
   a. Labeling confusion of the product has shown that counseling must be provided by the pharmacist.
   b. Too much of the product was shown to cause serious adverse effects and therefore the drug needs to be regulated by pharmacy staff.
   c. Placement in the pharmacy out of direct customer access helps to monitor the sale of the drug.
   d. Where the product is stocked depends on directions for use found on package labeling.

   ANS: C
   The Combat Methamphetamine Epidemic Act of 2005 (CMEA) was signed into law on March 6, 2006, to regulate, among other things, retail over-the-counter sales of ephedrine, pseudoephedrine, and phenylpropanolamine products. Purchase limits, placement of product out of direct customer access, sales logbooks, customer ID verification, employee training, and self-certification of regulated sellers are required provisions of the CMEA.

   DIF: Cognitive level 4: Analysis REF: p. 9

14. Which of the following auxiliary labels should always be placed on a prescription for an oral suspension?
   a. Take with food.
   b. Store in the refrigerator.
   c. Take with lots of water.
   d. Shake well before each use.

   ANS: D
   When suspensions are dispensed, a SHAKE WELL auxiliary label should be placed on the prescription bottle.


15. Which of the following routes would have the fastest onset of action?
   a. Oral
   b. Intravenous
   c. Topical
   d. Inhalation

   ANS: B
   An advantage to parenteral administration is rapid onset of action.

   DIF: Cognitive level 3: Application REF: p. 16

16. Why can’t ear drops be placed in the eye, but eye drops can be placed in the ear?
   a. Ear drops are more viscous, thereby reducing the absorption through the eye.
   b. Ear drops do not contain the special enzymes that are necessary in eye drops.
   c. Ear drops are not sterile, and only sterile products should be used in the eye.
   d. Medication errors can happen once the patient uses the medication.

   ANS: C
   Eye drops may be placed in the ear but ear drops should not be used in the eye.

   DIF: Cognitive level 4: Analysis REF: p. 12

17. Which of the following is not classified as a behind-the-counter (BTC) drug?
   a. Motrin
   b. Plan B
   c. Sudafed
   d. Insulin

   ANS: A
   Examples of BTC, Schedule II drugs include iron supplements, insulin, lice treatments (e.g., pyrethrins), aspirin for pediatric use, nitroglycerin, and exempt narcotics (e.g., Tylenol with codeine 8 mg). Examples of drugs that are sold BTC in both the United States and Canada are pseudoephedrine and Plan B.

   DIF: Cognitive level 4: Analysis REF: p. 9

18. Chemical properties of the drug influence _____ of the drug in the body.
   a. absorption
   b. distribution
   c. metabolism and elimination
   d. all of the above

   ANS: D
   Chemical properties of the drug influence absorption, distribution, metabolism, and elimination of the drug in the body.

   DIF: Cognitive level 1: Recall REF: p. 10
19. Which of the following could be an implication if postmarketing (phase 4) were taken out of the drug approval process?
   a. Additional safety information could be collected while on the market.
   b. Safety and efficacy would be determined when the drug is used in real-world conditions.
   c. Not all adverse reactions would be known, and the drug could be on the market longer than necessary.
   d. Long-term side effects could be identified when used in the mass population.

   ANS: C

   Additional safety information is collected in the postmarketing phase. Phase 4 trials are studies that are conducted after the drug is marketed to the public to determine safety and effectiveness when the drug is used in real-world conditions.

   DIF: Cognitive level 4: Analysis
   REF: p. 7

20. Which of the following drugs would belong to the proton pump inhibitor class?
   a. Amlodipine
   b. Pantoprazole
   c. Ranitidine
   d. Alprazolam

   ANS: B

   The ending of the official name of many drugs indicates the pharmacological class to which a drug belongs. From Table 1-2, the common ending for drugs in the proton pump inhibitor class is -prazole.

   DIF: Cognitive level 3: Application
   REF: p. 8

21. The term narcotic accurately describes which type of drugs?
   a. Pain relief controlled substances
   b. Pain relief legend drugs
   c. Controlled substances
   d. Legend drugs

   ANS: A

   Narcotics, controlled drugs, and benzodiazepines and targeted substances regulations are found in the Controlled Drug and Substances Act. Narcotics are identified by a symbol on the product label. From Table 1-5, drugs in this classification are used for pain relief and cause some sort of sleep-inducing properties, accurately describing the term narcotic.

   DIF: Cognitive level 3: Application
   REF: pp. 9-10

MATCHING

Match the following common drug endings with their classifications.

1. -olol
2. -prazole
3. -dipine
4. -thromycin
5. -profen

1. Calcium channel blocker
2. β-Adrenergic blocking drug
3. NSAID
4. Macrolide anti-infective
5. Proton pump inhibitor

1. ANS: C
2. ANS: A
3. ANS: E
4. ANS: D
5. ANS: B

DIF: Cognitive level 1: Recall
MSC: See Table 1-2 with common endings to official drug names.

Match the following controlled substances with their control schedule.

1. Marijuana
2. Methylphenidate
3. Diazepam
4. Diphenoxylate and buprenorphine
5. Methyltestosterone

6. C-III
7. C-II
8. C-V
9. C-I
10. C-IV

6. ANS: E

DIF: Cognitive level 1: Recall
MSC: Taken from Table 1-4 of controlled substance schedules.
7. ANS: B  DIF: Cognitive level 1: Recall  REF: p. 10
   MSC: Taken from Table 1-4 of controlled substance schedules.

8. ANS: D  DIF: Cognitive level 1: Recall  REF: p. 10
   MSC: Taken from Table 1-4 of controlled substance schedules.

   MSC: Taken from Table 1-4 of controlled substance schedules.

10. ANS: C  DIF: Cognitive level 1: Recall  REF: p. 10
    MSC: Taken from Table 1-4 of controlled substance schedules.

TRUE/FALSE

1. Drugs come only from natural origins.

   ANS: F
   Drugs may come from natural or synthetic origins.
   DIF: Cognitive level 1: Recall  REF: p. 5

2. Erythropoietin is an example of a biopharmaceutical.

   ANS: T
   Erythropoietin and human insulin are examples of biopharmaceuticals.
   DIF: Cognitive level 1: Recall  REF: p. 5

3. Generic drugs are always less expensive than the corresponding brand name drug.

   ANS: T
   Generic drugs are always less expensive than brand name drugs.
   DIF: Cognitive level 1: Recall  REF: p. 9

4. “Rx only” must be printed on the label of all legend drugs.

   ANS: T
   “Rx only” must be printed on the label of all prescription drugs.
   DIF: Cognitive level 1: Recall  REF: p. 9

5. Binders and fillers are inactive ingredients but have no influence on the rate of drug absorption.

   ANS: F
   Binders and fillers are inactive ingredients but may influence rate of drug absorption.
   DIF: Cognitive level 1: Recall  REF: p. 11