Sample Exam Questions, Benzodiazepine Drugs

Answer questions 1-8 below for the following benzodiazepine derivatives (I-IV):

1. Which of the benzodiazepine derivatives shown above (I-IV) produce their therapeutic effects via interaction with benzodiazepine receptors on the GABA receptor complex?
   A. Only IV
   B. Only II and III
   C. Only I, II and III
   D. All of the benzodiazepines above (I-IV)
   E. None of the benzodiazepines above

2. Which of the benzodiazepine derivatives shown above (I-IV) can produce sedation as either a desired effect or side effect?
   A. Only I
   B. Only I and II
   C. Only II and III
   D. Only I, II and III
   E. All of the benzodiazepines above (I-IV)

3. Which of the benzodiazepine derivatives shown above (I-IV) could be formulated as stable, water soluble salts for IV administration?
   A. Only I
   B. Only I and IV
   C. Only II and III
   D. Only I, II and III
   E. None of the benzodiazepines above (I-IV)
4. Which of the benzodiazepine derivatives shown above (I-IV) require metabolic activation before they can express their therapeutic activity?

A. Only IV
B. Only III
C. Only II and III
D. Only I and III
E. None of the benzodiazepines above (I-IV)  

5. Which relative order below (A-E) correctly ranks the duration of therapeutic effect (from longest to shortest) for benzodiazepines I-IV shown above?

A. III > I > II > IV
B. III > II > I > IV  
C. III > IV > II > I
D. IV > III > I > II
E. I > IV > III > II

6. Which of the benzodiazepine derivatives shown above (I-IV) are ultimately cleared as glucuronide conjugates (more than one metabolic step may occur before glucuronidation)?

A. Only II
B. Only II and III
C. Only I, II and III  
D. Only II, III and IV
E. All of the benzodiazepines above (I-IV)

7. Which of the benzodiazepine derivatives shown above (I-IV) undergo cytochrome-mediated oxidative N-alkylation?

A. Only III
B. Only III and IV  
C. Only I and III
D. Only I, III and IV
E. All of the benzodiazepines above (I-IV)

8. Which of the benzodiazepine derivatives shown above (I-IV) would be appropriate for the treatment of insomnia in a elderly patient with moderate hepatic impairment?

A. Only I
B. Only II
C. Only I and II  
D. Only I and IV
E. Only I, II and IV
9. Which functional groups circled (I-IV) in the benzodiazepine compound shown below are necessary for this drug to bind to benzodiazepine receptors and express its therapeutic effect?

A. Only III
B. Only IV
C. Only III and IV
D. Only II, III and IV
E. All (I-IV) are necessary

10. Which of the metabolites (I-IV) would be as therapeutically effective as the parent nitrobenzodiazepine shown below?

A. Only I
B. Only I and II
C. Only I and III
D. Only I, III and IV
E. All of the metabolites (I-IV)
Answer questions 11-14 below for the following barbiturate derivatives (I-IV):

11. Which barbiturates above (I-IV) would yield water soluble salts if treated with NaOH?

A. Only I
B. Only I and II
C. Only II and III
D. Only II, III and IV
E. All of the barbiturates above (I-IV) #

12. Which barbiturates above (I-IV) would be appropriate for oral long-term treatment of seizure disorders?

A. Only I
B. Only IV  #
C. Only III and IV
D. Only II and IV
E. Only II, III and IV

13. Which barbiturate above (I-IV) would have the shortest duration of action

A. I  #
B. II
C. III
D. IV

14. Which barbiturates above (I-IV) would be capable of forming epoxide metabolites by oxidative metabolism (cytochrome-mediated oxidation)?

A. Only I
B. Only IV
C. Only I and II
D. Only I, II and IV  #
E. All of the barbiturates above (I-IV)