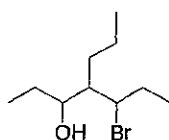


※注意：請於試卷上”選擇題作答區”依序作答

單選題 (75%)

1. What is the proper IUPAC name for the following compound?



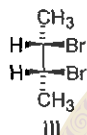
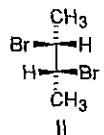
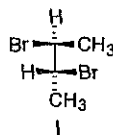
- (A) 4-propyl-5-bromo-3-heptanol (B) 4-propyl-3-bromo-5-heptanol
(C) 4-(1-bromopropyl)-3-heptanol (D) 5-bromo-4-propyl-3-heptanol

2. What is the name of the following compound?



- (A) Bicyclo[2.2.2]octane (B) Bicyclo[3.2.0]octane
(C) Bicyclo[4.1.1]octane (D) Bicyclo[4.2.0]octane

3. Which of the following is(are) *meso* compound(s)?



- (A) I (B) II (C) I and III (D) II and III

4. Which is a **true** statement concerning the transition state of the rate-determining step of a S_N1 reaction?

- (A) Structurally, it closely resembles the carbocation intermediate. (B) Both covalent bond-breaking and bond-making are occurring. (C) Formation of the transition state is an exothermic reaction. (D) Necessarily, the transition state has zero charge overall.

5. What is the major product of the reaction of I_2 with 2-methyl-2-pentene?

- (A) 3-bromo-2-iodo-2-methylpentane (B) 2-bromo-3-iodo-2-methylpentane
(C) 1-bromo-2-iodo-2-methylpentane (D) 2-bromo-1-iodo-2-methylpentane

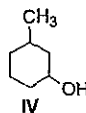
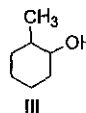
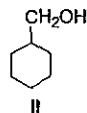
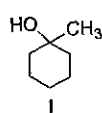
6. How many ^{13}C signals would you expect from chlorobenzene?

- (A) 3 (B) 4 (C) 5 (D) 6

7. Hydrogen atom abstraction from which position would yield the most stable free radical intermediate during the reaction of bromine with 2,2,3-trimethylpentane?

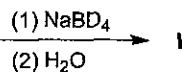
- (A) C1 (B) C3 (C) C4 (D) C5

8. Which of the following compounds is(are) reasonable product(s) in the oxymercuration-demercuration reaction of 3-methylcyclohexene?

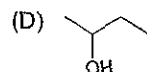
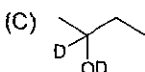
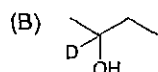
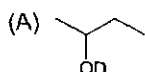


- (A) I (B) III (C) I and II (D) III and IV

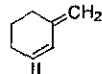
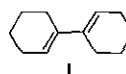
9. What would be the structure of product I in the following reaction?



I



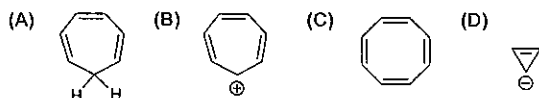
10. Which of these conjugated dienes is more likely to undergo a Diels-Alder reaction?



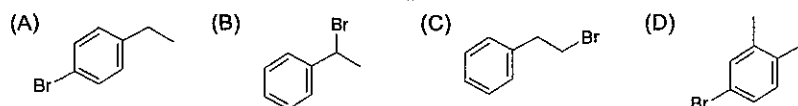
- (A) I (B) II (C) III (D) IV

見背面

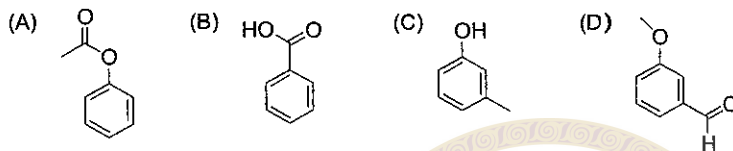
11. Which of the following compounds would you expect to be aromatic?



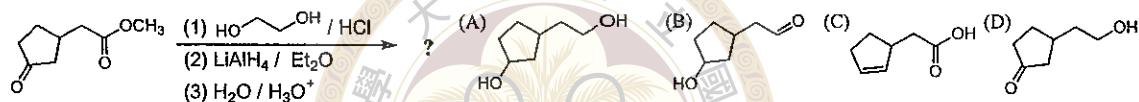
12. Which of the following substances, formula C_8H_9Br , might exhibit the following absorptions in the 1H NMR spectrum? Data: triplet, δ 1.2; quartet, δ 2.45; multiplet, δ 7.4



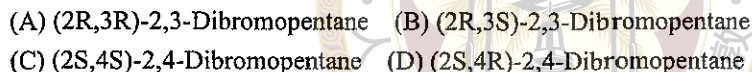
13. Which of the following compounds would be **most** reactive toward ring bromination?



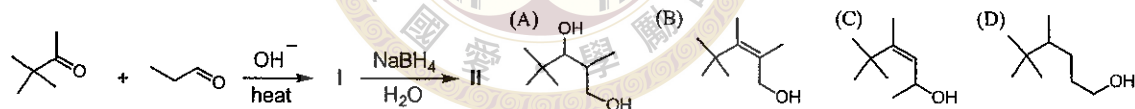
14. What is the major product of the following reaction sequence?



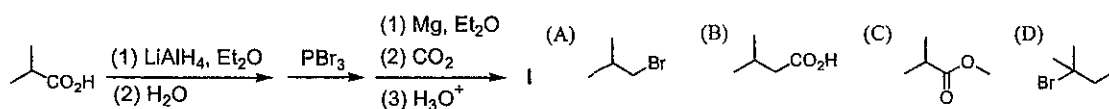
15. Which of the following molecules is achiral?



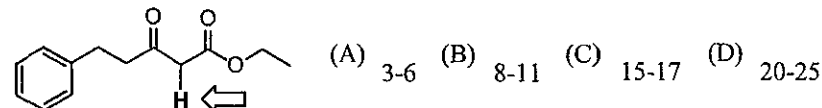
16. What would be the major product, **II**, of the following reaction sequence?



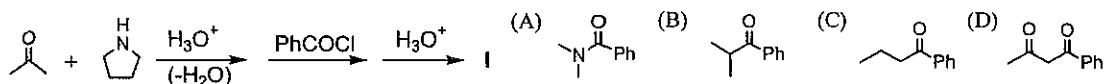
17. What would be the final product, **I**, of the following sequence of reactions?



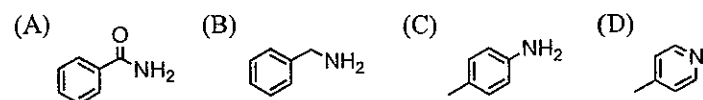
18. Which is the pK_a value of the hydrogen shown in the following compound?



19. What is the product, **I**, of the following reaction sequence?



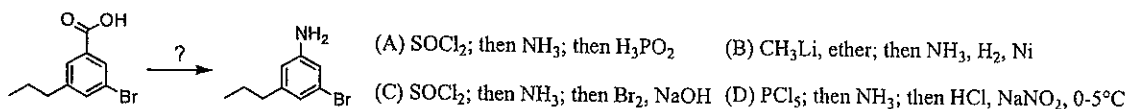
20. Which of the following compounds would be the strongest base?



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21. How could one carry out this synthesis?



22. Simple enols are generally less stable than the tautomeric keto forms because:

- (A) severe angle strain exists in the enol forms. (B) the C-C π bond is weaker than the C-O π bond.
 (C) fewer atoms are coplanar in the keto form. (D) Actually, simple enols are the more stable.

23. Which reagent would you use as the basis for a simple chemical test that would distinguish between hexane and 1-hexene?

- (A) $\text{NaOH}/\text{H}_2\text{O}$ (B) Br_2/CCl_4 (C) NaBH_4 (D) $\text{NaCN}/\text{H}_2\text{O}$

24. Aniline is the name commonly assigned to:

- (A) $\text{C}_6\text{H}_5\text{NH}_2$ (B) $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$ (C) $\text{C}_6\text{H}_5\text{N}$ (D) $\text{C}_2\text{H}_5\text{NH}_2$

25. Which of the following solvents is considered to be polar and protic?

- (A) hexane (B) ether (C) methanol (D) anisole

※注意：請於試卷上“非選擇題作答區”依序作答並應註明作答之題號

問答題

- 一. Draw structures corresponding to each of the following names: (a) 2-butenal; (b) phenylbenzoate (8%)
 二. Give the major organic product(s) for each of the following reactions or sequences of reactions. (8%)



- 三. Match each of the following functional groups to the regions of the infrared spectrum in which they absorb. (9%)

Functional Groups: O-H ; C=O ; $\text{C}\equiv\text{N}$; IR absorptions: 1750 cm^{-1} ; 2200 cm^{-1} ; 3400 cm^{-1}

試題隨卷繳回