

國立中山大學 107 學年度碩士暨碩士專班招生考試試題

科目名稱：有機化學【海資系碩士班丙組】

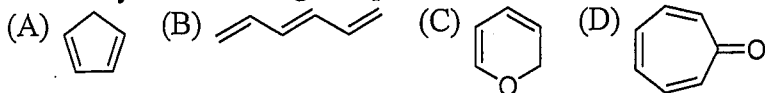
題號：452001

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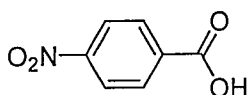
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一、單選選擇題(45%, 3% for each)

1. Classify the following compounds as an aromatic compound?

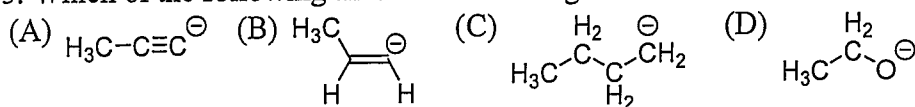


2. The correct name for

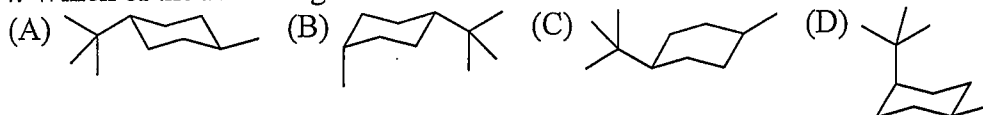


- (A) *p*-Nitrosobenzoic acid (B) *p*-Nitrobenzoic acid
(C) *p*-Nitridobenzoic acid (D) 4-Nitroxbenzoic acid

3. Which of the following anions is the strongest base?



4. Which of the following is the most stable isomer?



5. Which signal would you expect to be due to the α -proton of the carbonyl in ethyl acetate?

- (A) Singlet at δ 2.00 ppm (B) Triplet at δ 1.20 ppm (C) Quartet at δ 4.00 ppm
(D) Triplet at δ 4.00 ppm

6. Which of the following solvent is suitable to prepare samples for ^1H -NMR spectroscopy?

- (A) Chloroform (B) Acetone (C) Carbon tetrachloride (D) Water

7. Which of the following phenols is the most acidic?

- (A) *o*-Chlorophenol (B) *p*-Chlorophenol (C) *o*-Nitrophenol (D) 4-Methylphenol

8. Which method below will reduce triple bond to double bond?

- (A) Pd/C, H_2 (B) Pt/C, H_2 (C) Pt/ Al_2O_3 (D) Pd/ BaSO_4 , H_2

9. For carbonyl compounds, which type will have the highest absorption frequency in IR spectrum?

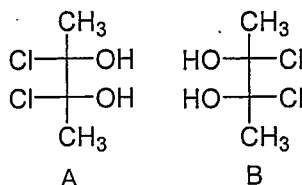
- (A) aldehyde (B) ketone (C) acid (D) anhydride

10 Which of the following statements is not collect?

- (A) In ^1H -NMR spectrum, hydrogen atoms having the same chemical shifts do not split each other.
(B) In ^{13}C spectrum, the height of the very narrow peak is not directly related to the number of carbon atoms undergoing that energy transition
(C) A mass spectrum is not a record of energy absorbed by a molecule in going from one energy level to another
(D) Generally, in UV spectrum, the more extended the conjugation, the longer the wavelength at which absorption take place.

11. A and B is

- (A) enantiomers (B) diastereomers
(C) geometric isomers (D) stereoisomers



背面有題

試題隨卷繳回

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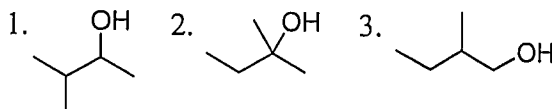
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12. Which of the following statements about leaving group is correct?

- (A) a good leaving group is usually a strong base.
 (B) the more electronegative the group, the better it is a leaving group.
 (C) the leaving ability of halogens follows $F^- < Cl^- < Br^- < I^-$
 (D) none of above

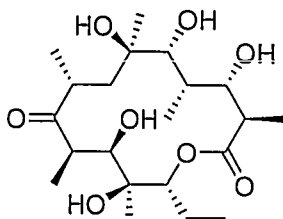
13. In which of the following are the compounds shown listed in order of increasing reactivity to acid-catalyzed dehydration?



- (A) $1 < 2 < 3$ (B) $1 < 3 < 2$ (C) $2 < 3 < 1$ (D) $3 < 1 < 2$

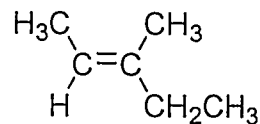
14. the species shown right is

- (A) an alkaloid
 (B) a polyketide
 (C) a diterpene
 (D) a peptide



15. What is the correct IUPAC name for compound shown right?

- (A) *trans*-3-methyl-3-pentene
 (B) (*E*)-3-methyl-2-pentene
 (C) (*Z*)-3-methyl-2-pentene
 (D) (*Z*)-3-ethyl-2-butene

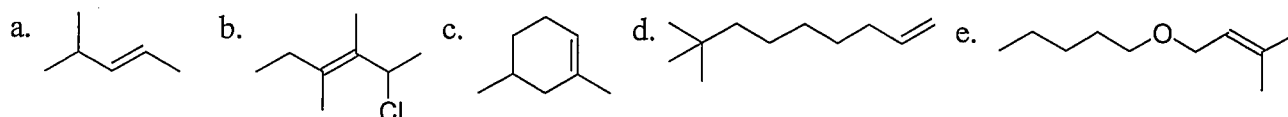


二、問答題：(55%)

1. Explain the following terms (15%, 3% for each)

- Germinol coupling
- McLafferty rearrangement
- Claisen reaction
- Diels-Alder reaction
- Wagner-Meerwein Rearrangement

2. Provide IUPAC names for the following compounds. (15%, 3% for each)



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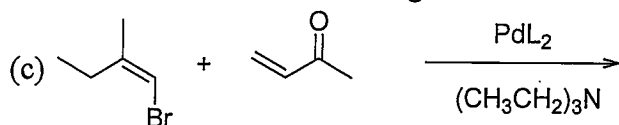
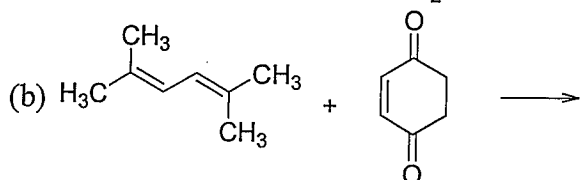
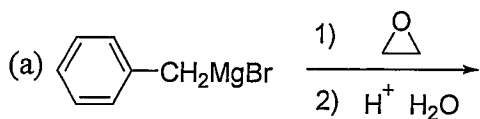
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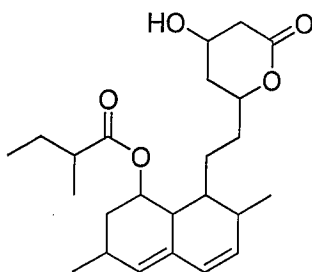
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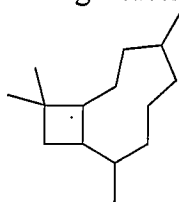
3. Give the expected major product for the following reactions. (9%, 3% for each)



4. Mevacor is used clinically to lower serum cholesterol levels. How many asymmetric centers does Mevacor have? (3%)



5. Please indicate the isoprene units of the following structures (3%)



6. DETERMINE and EXPLAIN the structure of the compound whose molecular formula is $C_3H_5Cl_3$ for which the mass, IR, 1H NMR, DQFCOSY and ^{13}C /DEPT NMR spectra are given. (10%)

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