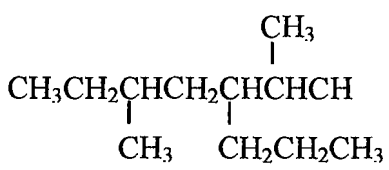
大葉大學96學年度轉學招生考試試題紙						
學系	部別：日間部/第二部/進修學士班/四技	年級	考試科目（中文名稱）	考試日期	節次	備註 共三頁
生物產業科技	日間部	三	有機化學	7月31日	3	P2-1

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）。 11:10 ~ 12:30

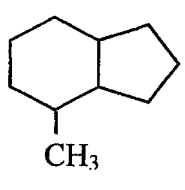
選擇題，每題二分(100%) 請依題號於答案卡上畫記作答，答錯不倒扣

1. Which molecule has a zero dipole moment? (A) CH_3Cl (B) CCl_4 (C) CH_2Cl_2 (D) $CHCl_3$
2. When the 1s orbitals of two hydrogen atoms combine to form a hydrogen molecule, how many molecular orbitals are formed? (A) 4 (B) 3 (C) 2 (D) 1
3. Which of these substances contains both covalent and ionic bonds? (A) H_2O_2 (B) H_2S (C) HCN (D) NH_4Cl
4. Which molecule contains an sp-hybridized carbon? (A) HCN (B) CH_3Cl (C) CH_3CH_3 (D) $CH_2{=}CH_2$
5. The number of unique monochloro derivatives of propene is (A) 1 (B) 2 (C) 3 (D) 4
6. Of the following compounds, the one with the highest boiling point is (A) CH_3CHO (B) CH_3CH_2Cl (C) CH_3CH_2OH (D) CH_3CH_3
7. In the reaction, $Na^+NH_2^- + CH_3OH \rightarrow CH_3O^-Na^+ + NH_3$, the stronger base is (A) $Na^+NH_2^-$ (B) CH_3OH (C) $CH_3O^-Na^+$ (D) NH_3
8. An IUPAC name for the following compound is



(A) 2, 5-Dimethyl-3-propylheptane
(B) 3, 6-Dimethyl-5-propylheptane
(C) 2-Methyl-3-(2-methylbutyl) hexane
(D) 3-Methyl 5-(1-methylethyl) octane

9. A correct name for the following compound is



(A) 2-Methylbicyclo [4.3.1] nonane
(B) 1-Methylbicyclo [4.3.0] nonane
(C) 2-Methylbicyclo [4.3.0] nonane
(D) 1-Methylbicyclo [4.3.1] nonane

10. Hexane and 3-methylpentane are examples of (A) enatiomers (B) constitutional isomers (C) stereoisomers (D) diastereomers
11. Which alkyl halides would you expect to undergo S_N1 hydrolysis most rapidly? (A) $(CH_3)_3CI$ (B) $(CH_3)_3CBr$ (C) $(CH_3)_3CCl$ (D) $(CH_3)_3CF$
12. S_N2 reactions of the type, $Nu^- + RL \rightarrow Nu\text{-}R + L^-$, are favored (A) when tertiary substrates are used. (B) by using a high concentration of the nucleophile. (C) by using a solvent of high polarity. (D) by the use of weak nucleophiles.
13. Which of the following is isomeric to pentane? (A) 1-Methylcyclobutane (B) 2,3-Dimethylbutane (C) 2,2-Dimethylpropane (D) 2,2-Dimethylpentane
14. The C–C–C bond angles in a saturated hydrocarbon is typically (A) 120° (B) 90° (C) 109.5° (D) 60°
15. The first organic compound synthesized from inorganic components by chemists was (A) carbonic acid (B) urea (C) methane (D) ammonium cyanate
16. The hydroxide ion concentration of a solution of a base is 0.001 M. The pH of the solution is (A) 4 (B) 8 (C) 11 (D) 3
17. Bulky groups on cyclohexane are most likely to be found (A) In axial positions (B) In equatorial positions (C) Equally in axial and equatorial positions (D) Axial and equatorial positions are not a factor for substitutions

18. Fructose is (A) an aldohexose (B) an aldopentose (C) a ketohexose (D) a ketopentose
19. Rearrangements are likely to occur in which of the following reaction types? (A) Both S_N1 and S_N2 reactions. (B) Both S_N1 and E1 reactions. (C) Both E1 and E2 reactions. (D) Both S_N2 and E2 reactions.
20. Select the strongest nucleophile for an S_N2 reaction. (A) H_2O (B) ROH (C) OH^- (D) RO^-
21. Which of the following is **not** a nucleophile? (A) H_2O (B) CH_3O^- (C) NH_3 (D) NH_4^+
22. A peptide bond is a(n) _____bond. (A) carboxylic acid anhydride (B) pyrophosphate (C) amide (D) ester
23. Which reagent given below could be used to synthesized *cis*-1, 2-cyclopentanediol from cyclopentene? (A) $KMnO_4$ (B) H_2SO_4 (C) HOCOOH (D) All of these.
24. $(CH_3)_3C(CH_2)_2CH(CH_3)_2$ is (A) Nonane (B) 2,5,5-Trimethylhexane (C) 2,2-Dimethylheptane (D) 2,2,5-Trimethylhexane
25. Which of the following substance will cause bromine to lose its color? (A) Pentane (B) Cyclopentane (C) 1-Methylcyclopentane (D) *cis*-2-Pentene
26. Fatty acids are (A) Mineral acids (B) Aromatic acids (C) Carboxylic acids (D) Cyclic acids
27. 2-Butene treated with potassium permanganate produces (A) butanoic acid (B) 2-butyne (C) 2-butanol (D) 2,3-butandiol

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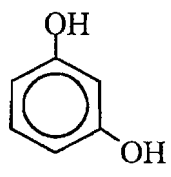
28. When 2,3-dimethyl-2-butene is exposed to hydrogen gas under pressure with a Ni catalyst the product is
(A) 3-hexyne (B) 2,3-dimethylbutane (C) *cis*-1,2-dimethylcyclobutane (D) *trans*-1,2-dimethylcyclobutane
29. The open and ring forms of glucose represents an equilibrium between (A) An alcohol with a ketone and a hemiketal (B) An alcohol with an aldehyde and a hemiacetal (C) A ketal and a ketone with an alcohol (D) An acetal and an aldehyde with an alcohol
30. Which reaction of an alkene proceeds with anti addition? (A) Hydrogenation (B) Bromination (C) Epoxidation (D) Permanganate oxidation
31. How many chiral carbons are there in the open chain form of glucose? (A) 2 (B) 3 (C) 4 (D) 5
32. Which compound would have the highest boiling point? (A) $CH_3CH(OH)CH_3$ (B) CH_3CHOCH_3 (C) $CH_3CH_2CH_2OH$ (D) $HOCH_2CH_2OH$
33. Acetic acid is a common name for (A) methanoic acid (B) butanoic acid (C) ethanoic acid (D) pentanoic acid
34. The shape of NH_4^+ is best described by (A) planar (B) octahedral (C) pyramidal (D) tetrahedral
35. The electrons that reside in the outermost energy levels of an atom are called _____. (A) bonded electrons (B) nonbonded electrons (C) lone pairs (D) valence electrons
36. The correct IUPAC name for *tert*-butyl alcohol is (A) 2-butanol (B) 2-methyl-1-propanol (C) 2-methyl-2-propanol (D) 1,1-dimethyl-1-ethanol
37. The linkage between the monosaccharides in lactose is a(n) (A) hemiacetal (B) ketal (C) acetal (D) hemiketal
38. How many signals would you expect to find in the ^1H NMR spectrum of $CH_3OCH_2CH_2OCH_3$? (A) 1 (B) 2 (C) 4 (D) 6
39. Electronegativity is (A) the measure of an atom's ability to make ionic bonds. (B) the amount of energy required for an atom to lose an electron. (C) the amount of energy required for an atom to accept an electron. (D) the ability of an atom to attract electrons to itself in a chemical bond.
40. Alcohols with less than four carbons are miscible with water because these alcohols (A) are liquids less dense than water (B) are liquids (C) form hydrogen bonds to multiple water molecules (D) are colorless
41. Which monosaccharide is recovered from the hydrolysis of glycogen? (A) D-Galactose (B) D-Gulose (C) D-Glucose (D) Maltose
42. How could you convert an unsaturated fatty acid into a saturated fatty acid? (A) $KMnO_4$, OH^-, heat (B) OH^-, H_2O, heat; then H_3O^+ (C) H_2, Ni, pressure (D) H_3O^+, H_2O, heat
43. Markovnikov addition of HCl to propene involves (A) initial attack by a chlorine ion. (B) isomerization of 1-chloropropane. (C) formation of a propyl cation. (D) formation of an isopropyl cation.
44. The relationship of propanone and propen-2-ol is designated by the term (A) tautomers. (B) stereoisomers. (C) conformational isomers. (D) diastereomers.
45. In which of the following sequences are the compounds listed in order of decreasing acidity?
(A) $CH_3COOH > H_2O > CH_3CH_2OH > HC\equiv CH > NH_3$
(B) $CH_3CH_2OH > CH_3COOH > H_2O > HC\equiv CH > NH_3$
(C) $H_2O > CH_3COOH > CH_3CH_2OH > HC\equiv CH > NH_3$
(D) $CH_3CH_2OH > H_2O > CH_3COOH > NH_3 > HC\equiv CH$
46. What is the IUPAC name for



(A) *m*-hydroxyphenol
(B) 1,3-dihydroxybenzene
(C) *m*- dihydroxybenzene
(D) 1,3-benzenediol

47. Which of the following compounds can exhibit *cis-trans* isomerism? (A) 1-Pentene. (B) 2-Pentene. (C) 2-Methyl-2-pentene. (D) 3-Methyl-1-pentene.
48. Which is a non-reducing disaccharide? (A) Sucrose (B) Cellobiose (C) Maltose (D) Lactose
49. Select a reagent that could be used in the separation of cyclohexane from cyclohexene. (A) CrO_3/H^+ (B) H_2/Zn (C) $KMnO_4$ (D) Br_2/CCl_4
50. Which of these is **not** a true statement? (A) All Lewis bases are also Brønsted-Lowry bases. (B) All Brønsted-Lowry acids contain hydrogen. (C) All Lewis acids are electron deficient. (D) All Lewis acids contain hydrogen.