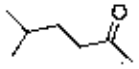
國立中央大學九十一學年度碩士班研究生入學試題卷

所別：生命科學系　不分組　科目：有機化學　共 1 頁 第 1 頁

(一) 是非題 (以下敘述正確者，在答案紙畫 O；敘述錯誤者畫 X；每題 3 分，答對得 3 分；答錯倒扣 2 分；不答不計分，本大題共 60 分)

(1) A correct name for the compound shown below is isopentyl methyl ketone.



(2) The order of decreasing reactivity of aldehydes, esters, and ketones towards the organozinc compounds used in the Reformatsky reaction is Aldehydes > Esters > Ketones.

(3) The final product of the following reaction is ethyl 4-chlorobenzoate.

4-chlorotoluene $\xrightarrow[OH^-,\ heat]{KMnO_4}$ $\xrightarrow{H^+}$ $\xrightarrow{SOCl_2}$ $\xrightarrow[base]{EtOH}$ product

(4) Cl_3CCOOH has a smaller value of p*Ka* than CH_3COOH.

(5) $(CH_3)_3CBr$ cannot be used effectively in a Gabriel amine synthesis.

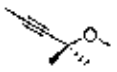
(6) Neopentyl isobutyrate has the IUPAC name: 2,2-dimethylpropyl 2-methylpropanoate.

(7) Removal of a hydride ion from cyclopentadiene produces an aromatic cation.

(8) In a Diels-Alder reaction, the adduct formed most rapidly is generally the exo product.

(9) A thermodynamically-controlled reaction will yield predominantly the more/most stable product.

(10) CrO_3 in H_2SO_4 can serve as the basis for a simple chemical test to distinguish between $CH_3CH{=}CHBr$ and $CH_2{=}CHCH_2Br$.

(11) $H_3C{-}{\equiv}$ $\xrightarrow{NaNH_2}$ $\xrightarrow{CH_3COCH_3}$ $\xrightarrow{CH_3I}$ 

(12) $C_6H_5CH_2OH$ $\xrightarrow{PBr_3}$ $\xrightarrow{Mg}$ $\xrightarrow{ethylene\ oxide}$ $\xrightarrow{H_3O^+}$ $C_6H_5CH_2CH_2CH_2OH$

(13) The activation energy is zero in the chain-terminating step of a radical chain reaction.

(14) The reaction of Oxymercuration-demercuration of alkenes follows the Markovnikov's rule.

(15) $HOCH_2CH_2CH_2CH_2CH_2OH$ has a higher boiling point than $CH_3OCH_2CH_2CH_2OCH_3$ because of larger dispersion forces.

(16) Molecules containing a stereocenter must be chiral.

(17) The stronger the acid, the more positive the value of ΔG° for the dissociation.

(18) The dipole moments of CO_2 and CCl_4 are zero.

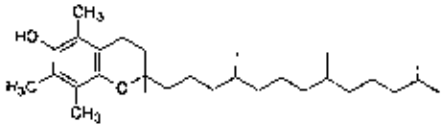
(19) The J^3 coupling constant of H-C=C-H in proton NMR is trans isomer < cis isomer.

(20) The nitro group has a pair of strong IR band at 1650 and 1450 cm^{-1}.

(二) 回答下列問題: (每題 10 分，共 40 分)

(1) Propose a method for the conversion of stilbene (Ph-C=C-Ph) to diphenylacetylene (Ph-C≡C-Ph).

(2) Vitamin E (α-tocopherol)(structure is shown below) is capable of acting as a radical trap, and one of the important roles that Vitamin E plays in the body may be in inhibiting radical reactions that could cause cell damage. Propose a mechanism to account for the antioxidation behavior of Vitamin E.



(3) What is the definition of a S_N2 reaction? How do you know if a reaction is via a S_N2 pathway?

(4) What are the definitions of secondary, tertiary, and quaternary structures of protein?

參考