

MEGA LECTURE

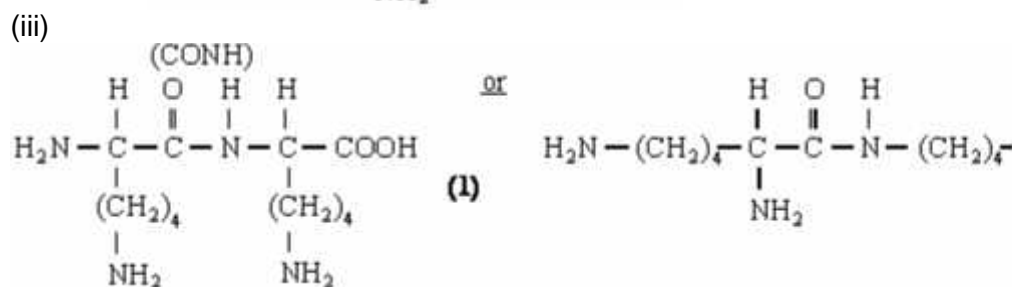
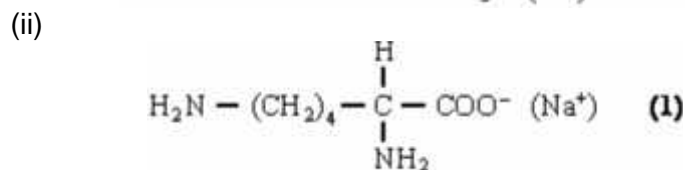
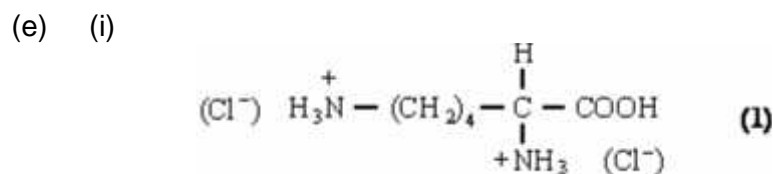
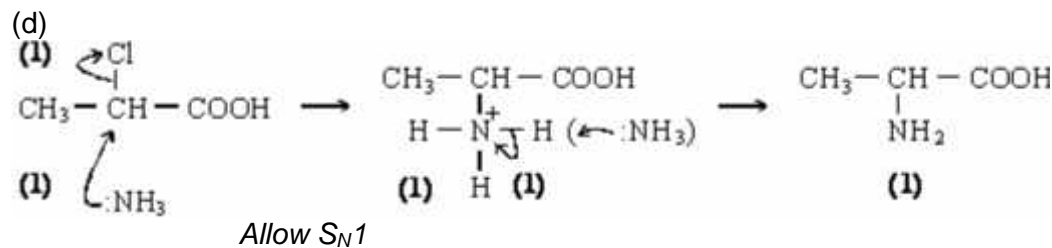
TOPIC 20 TEST MS

1. **M1** phase or eluent or solvent (or named solvent) is moving or mobile 1
M2 stationary phase or solid or alumina/silica/resin 1
M3 separation depends on balance between solubility or affinity (of compounds) in each phase 1
OR
different adsorption or retention
OR
(amino acids have) different R_f values
OR
(amino acids) travel at different speeds or take different times 1
- [3]
2. (a) **R:** O H (alcohols) (1)
S: C=O or carbonyl (1) 2
- (b) aldehyde (1) CHO or RCHO (1) 1
- (c) (i) *Reason 1:* TMS inert or non-toxic or volatile / easily removed
Reason 2: single (intense) peak
peak of 12 protons
has 12 equivalent protons
all protons in same environment
OR
peak / signal upfield of others
highly shielded
more shielded
peak away from others or $\delta = 0$ or low
not solvent, not cheap
any 2 reasons x (1)
- (ii) Solvent: $CDCl_3$ or CCl_4 (**NOT D_2O**)
Reason: proton free (1)
allow no hydrogens (atoms)
NOT H^+ / hydrogen ions 4
- (d) (i) $CH_3 - \overset{\overset{O}{\parallel}}{C} -$ (1)
(ii) $-OH$ (1)
(iii) $-CH_2-CH_2-$ (1) 3
- (e) $CH_3 - \overset{\overset{O}{\parallel}}{C} - CH_2 - CH_2 - OH$ (1) 1
[11]

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3. (a) 2-chloropropanoic acid (1) 1
 (b) 1.72 Doublet \ddagger next to CH (1) 2
 4.44 Quartet \ddagger next to CH₃ (1)

- (c) Two triplets (1) 1



Or anhydride 3

[12]

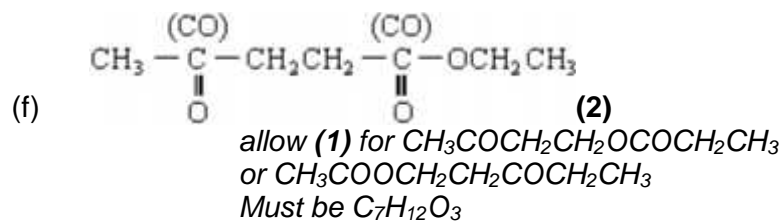
4. (a) 5 (1) 1
 (b) 2:2:2:3:3 (1) 1
any order but not multiples



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- (d) CH_3CH_2 or C_2H_5 or ethyl (1)
 4.13 (quartet) : CH_2 peak split by CH_3 / next to CH_3 (1)
 1.26 (triplet) : CH_3 peak split by CH_2 / next to CH_2 (1)

- (e) CH_2CH_2 (1)



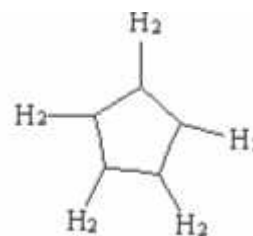
5. (a) (i) There are three pairs of equivalent carbon atoms
 (ii) 75ppm
 (b) (i) 4
 (ii) 2
 (c) Each structure can represent a pair of cis/Z and trans/E isomers
 OR
 Optical isomers

6. (a) A any C_5 alkene

B

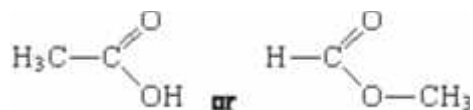


penalise



- (b) C

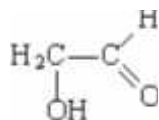
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or CH_3COOH or HCOOCH_3

1

D

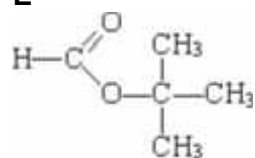


or HOCH_2CHO

1

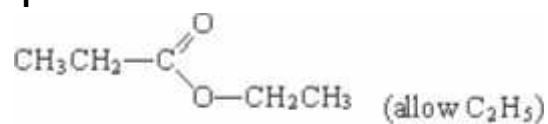
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(c) **E**



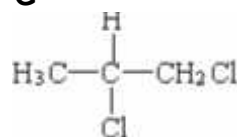
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F



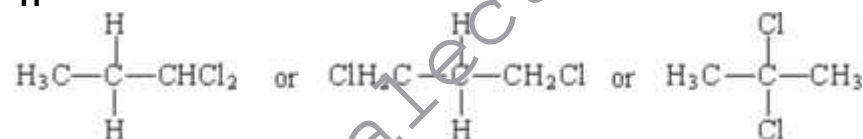
1

(d) **G**



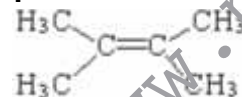
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H



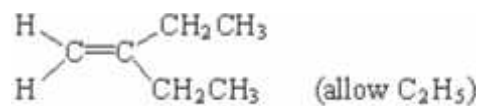
1

(e) **I**



1

J



NOT hex-3-ene

1

[10]