M. Sc. I Sem. II
Organic Chemistry Sample Questions

1. The wavenumber of a transition is 2000 cm^{-1}. In what part of the electromagnetic spectrum does this come?
A) Ultraviolet-visible.

B) Microwave

C) Infrared

D) Radio wave

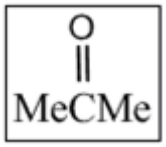
2. According to the Beer-Lambert Law, on which of the following does absorbance not depend?
A) Colour of the solution.

B) Distance that the light has travelled through the sample.

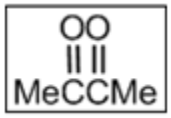
C) Extinction coefficient of the sample.

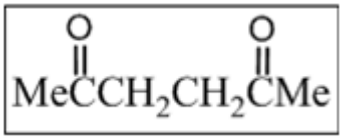
D) Solution concentration.

3. Which of the following ketones has the longest wavelength n→ π* absorption?

A) 

B) 

C) 

D) 

4. Which one of the following nuclei has a magnetic moment (so that an NMR experiment can be performed)?
A) ^{12}C

B) ^{14}N

C) ^{16}O

D) ^{32}S

5. In infrared spectroscopy which frequency range is known as the fingerprint region?
A) 400 - 1400cm^{-1}

B) 1400 - 900cm^{-1}

C) 900 - 600cm^{-1}

D) 600 - 250cm^{-1}

6. In which region of the infrared spectrum would you expect to find a peak characteristic of a triple bond stretch?
A) 4000 - 3000cm^{-1}

B) 2500 - 2000cm^{-1}

C) 2000 - 1500cm^{-1}

D) 1500 - 750cm^{-1}

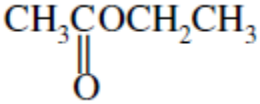
7. The conversion of nitro compound into carbonyls is known as:
A) Corey fuchs reaction

B) Nef reaction

C) Schmidt rearrangement

D) Claisen rearrangement

8. What is the carbonyl absorption of the molecule in IR spectroscopy?



A) 1400 cm^{-1}

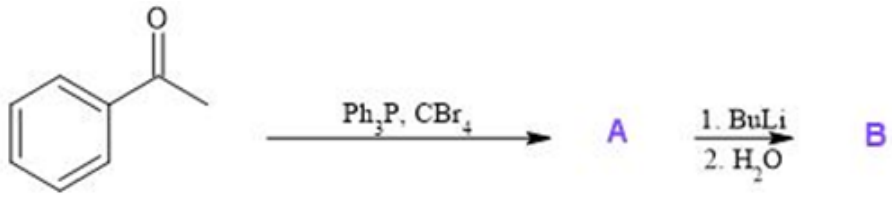
B) 1745 cm^{-1}

C) 2500 cm^{-1}

D) 3500 cm^{-1}

9. Predict the products A and B in the following reaction:

A)



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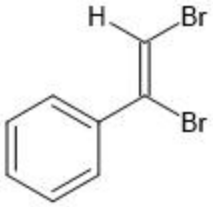
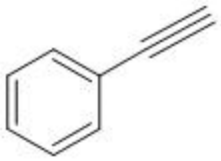
A = 

B = 

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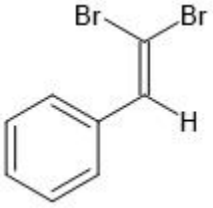
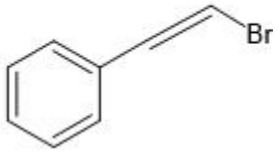
A = 

B = 

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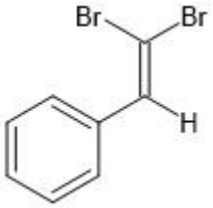
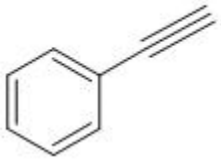
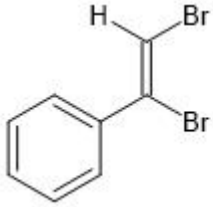
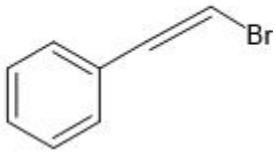
A = 

B = 

E)

A = 

B = 

10. Which of the following vibrational modes show no IR absorption bands?

A) Symmetrical CO_2 stretch

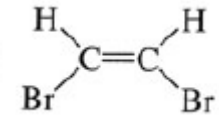
B) antisymmetrical CO_2 stretch

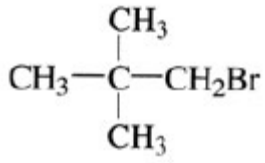
C) symmetrical $O{=}C{=}S$ stretch

D) $C{=}C$ stretch in o-xylene

11. In which of the following molecules does spin-spin coupling occur?

A) $ClCH_2CH_2Cl$

B) 

C) 

D) CH_3CH_2Cl

12. Which statement about Claisen condensation is incorrect?
A) The reaction involves C-C bond formation

B) A strong based is required to remove H^+ from from an α- proton in one of the starting esters

C) The reaction involves the condensation of two esters in the presence of strong base

D) The product is a β- keto ester which resists deprotonation by the strong base in the reaction mixture

13. Lithium diisopropylamide (LDA):
A) Can be used to deprotonate butanone

B) Is a good nucleophile

C) Is formed by reacting an amide with butyl lithium

D) Contains a $CONH_2$ group

14. Which statement is incorrect about an enolate?
A) An enolate is a good electrophile

B) An enolate can accept a proton

C) An enolate is the conjugate base of an enol

D) An enolate can function as a nucleophile

15. The IR spectrum of shows following peaks, identify peak for -OH functional group present in it.

o-$HOC_6H_4COOCH_3$,

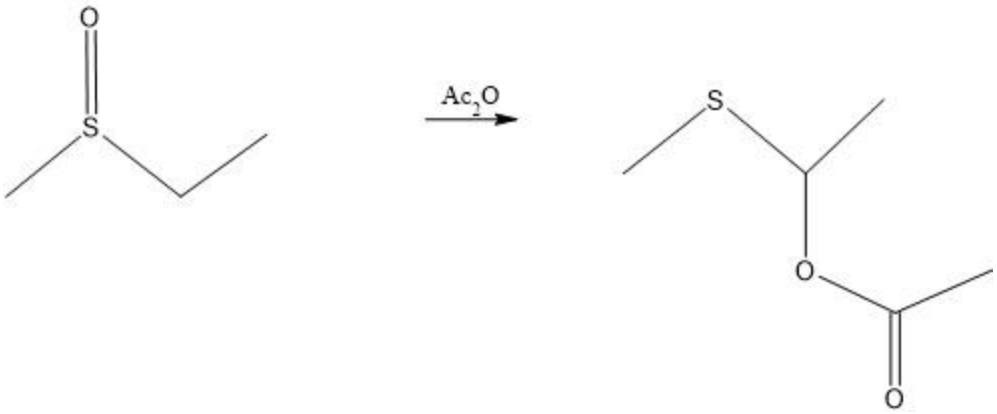
A) 1700 cm ^{1}

B) 3050 cm^{-1}

C) 3300 cm^{-1}

D) 2990 cm^{-1}

16. Name the following rearrangement:



A) Lossen rearrangement

B) Hofmann rearrangement

C) Pummerer rearrangement

D) Brook rearrangement

17. What is the main difference between Hofmann and Curtius rearrangement?
A) Products are different

B) Intermediate formed is different

C) Reactants are different

D) Isomers

18. Which intermediate is formed in Wolf rearrangement?
A) Carbene

B) Carbocation

C) Carbanion

D) Ketene

19. Which of the following is an example of anionic rearrangement?
A) Neber rearrangement

B) Dienone- phenol rearrangement

C) Wolf rearrangement

D) Rupe rearrangement

20. Which of the following is used as a catalyst in Baylis- Hilmann reaction?
A) H_2SO_4

B) DABCO

C) DMSO

D) DMF

Answer Key

Question	Answer	Question	Answer
1	c	11	d
2	a	12	d
3	c	13	a
4	b	14	a
5	a	15	c
6	b	16	c
7	b	17	c
8	b	18	d
9	c	19	a
10	a	20	b