

Time: 60 min



April 29, 2015

Family Name: _

First Name : _

I.D. # : _



Please circle your recitation section

Section 1	9 M	Randa Jaber
Section 2	11 W	Hana Deeb
<u>Section 3</u>	10 W	Randa Jaber

Kindly read and understand the following points:

- Make sure you write your name, ID # and section.
- The penalty for Cheating is a grade of zero on the exam.
- Cellular phones should be turned off.
- Total number of pages including this cover is 7

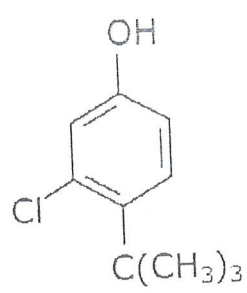
1. 16 / 242. 3 / 123. 10 / 104. 20 / 405. 13 / 146. 5 / 5 (Bonus)Total: 65 / 100

67 +2

Good Luck! ☺

1. Answer the following questions

a) What is the IUPAC name of the following compound?



Answer:

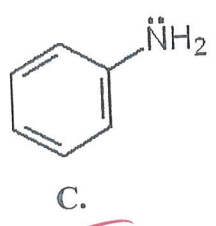
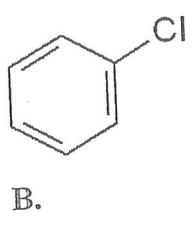
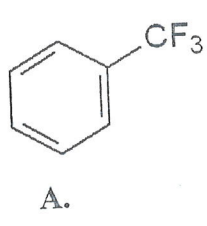


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4-tert-butyl 3-chloro-1-phenol

3

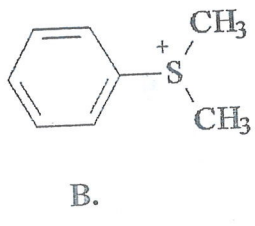
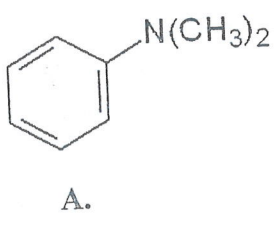
b) Which compound will react faster with Br₂ in FeBr₃?



Answer:

C

c) Which compound will add a nitro group to the meta position?

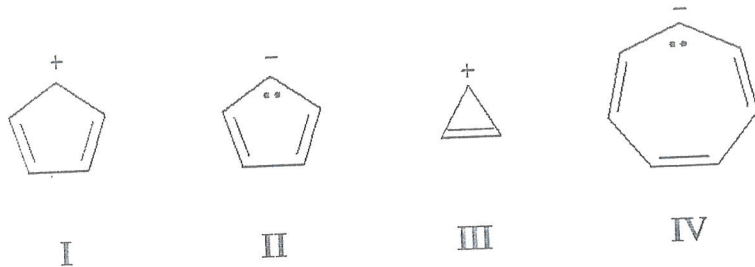


Answer:

B



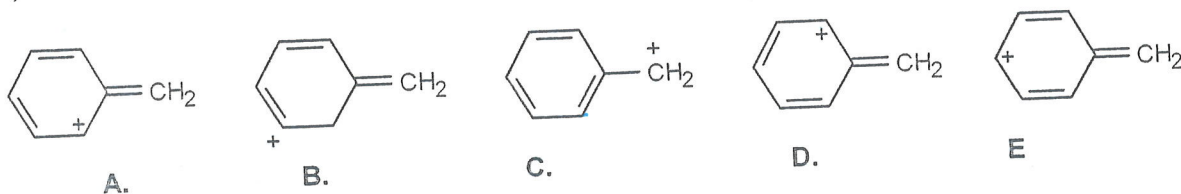
d) Which of the following ions are aromatic species?



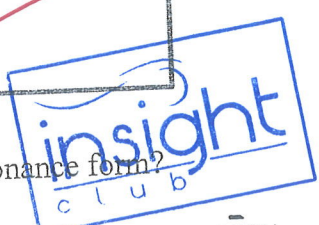
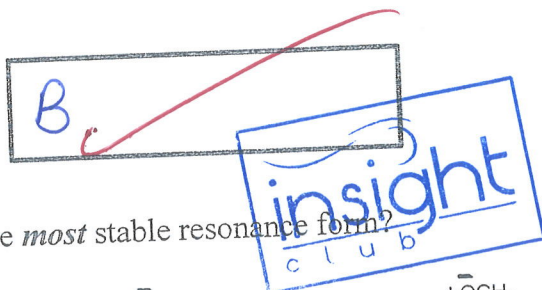
Answer:



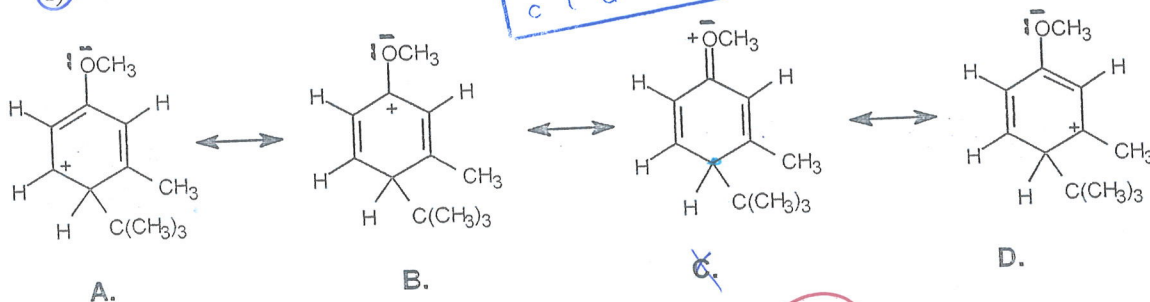
e) Which of the following structures is *not* a resonance form of the benzyl cation?



Answer



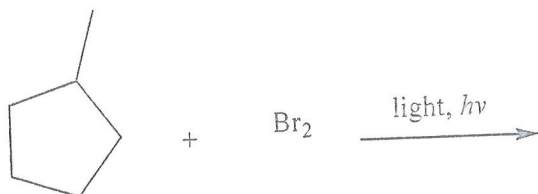
f) Which is the *most* stable resonance form?



Answer



3
2. Consider the following free radical reaction



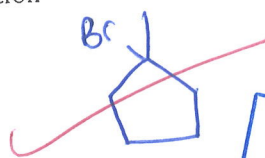
a) In which step is light involved write the equation of the reaction using arrows

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b) Draw the structure of the major product of monobromination



c) How many monochlorination products do you expect to obtain from the chlorination of methylcyclopentane?

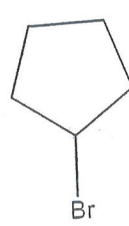


Answer:

~~5~~

3

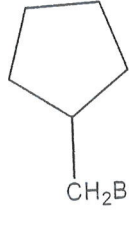
10
3. Consider the following alkyl halides:



A



B



C

a) Which is the most reactive in an S_N1 reaction? Explain briefly



Answer:

B

because its secondary and has on sp²

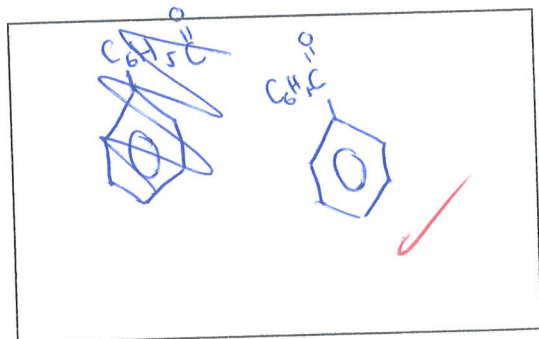
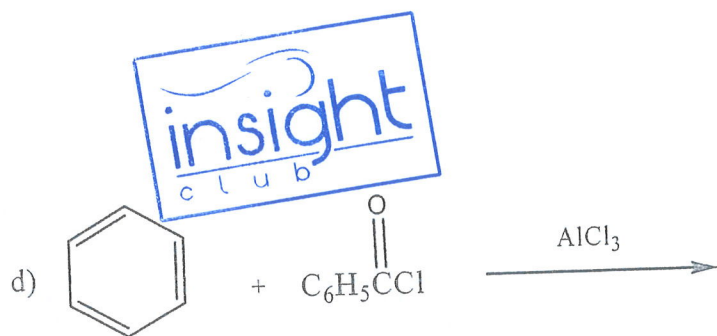
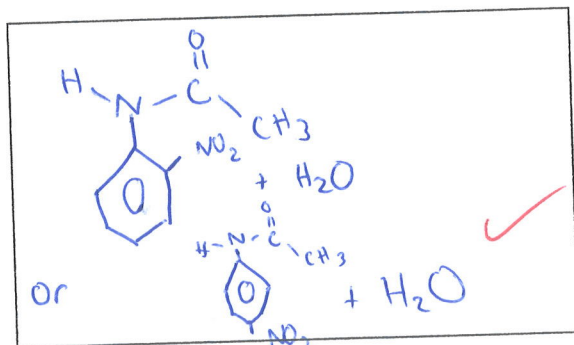
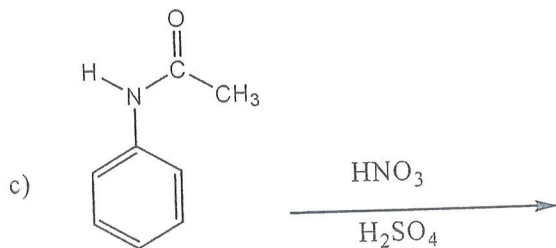
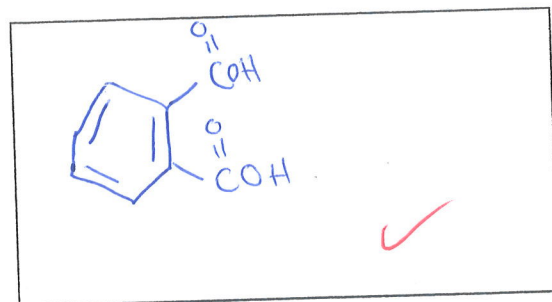
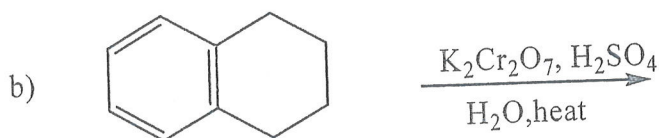
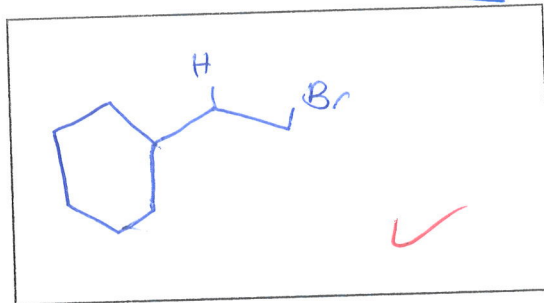
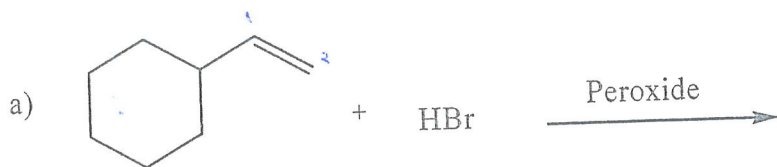
b) Which is the most reactive in an S_N2 reaction? Explain briefly

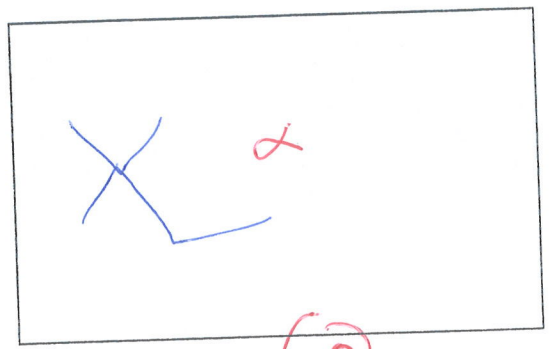
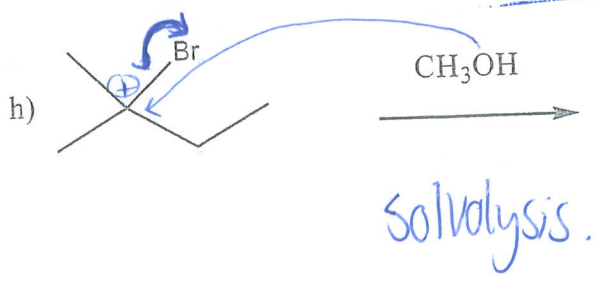
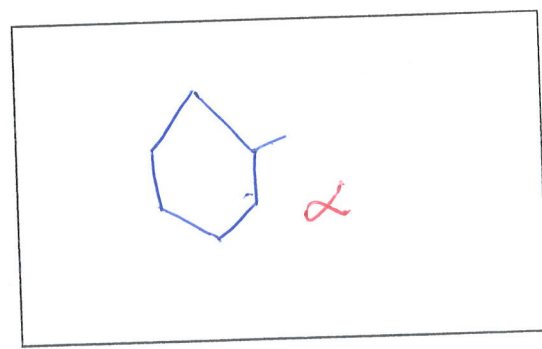
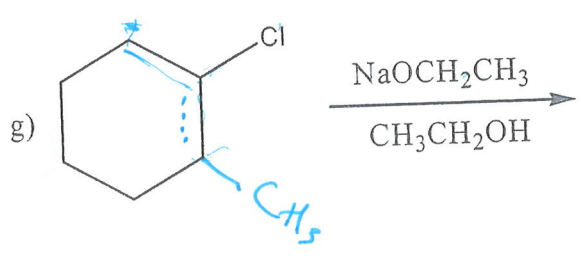
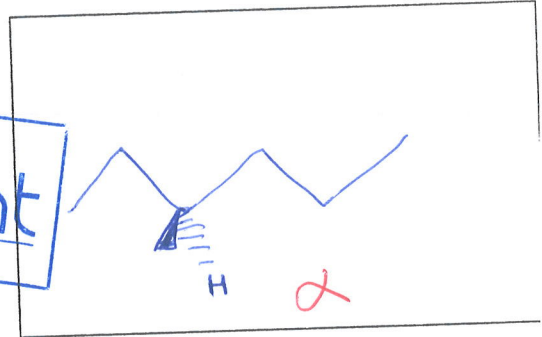
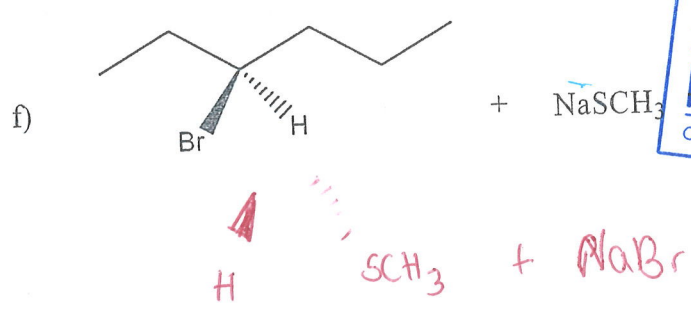
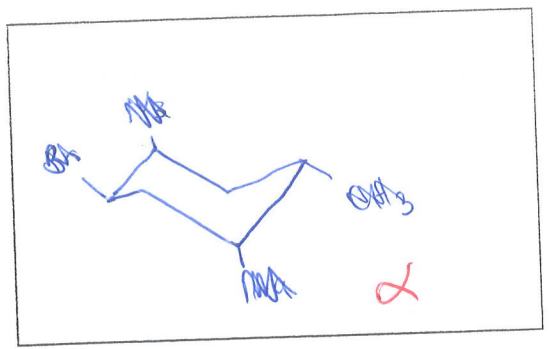
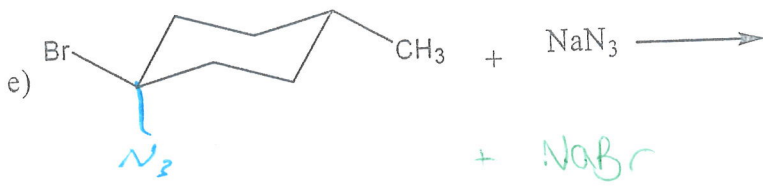
Answer:

C

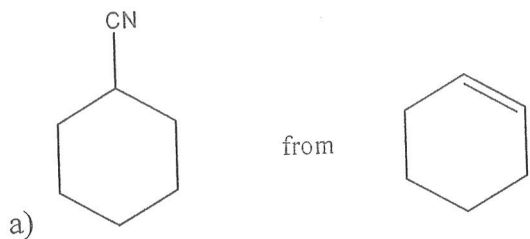
because its primary

4. Give the stereochemical structure of the major product of each of the following reactions.

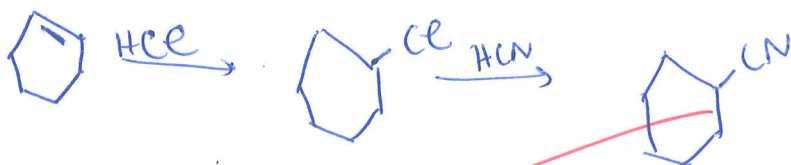




5. Outline an efficient synthesis of each of the following compounds from the indicated starting material and any necessary organic or inorganic reagents.

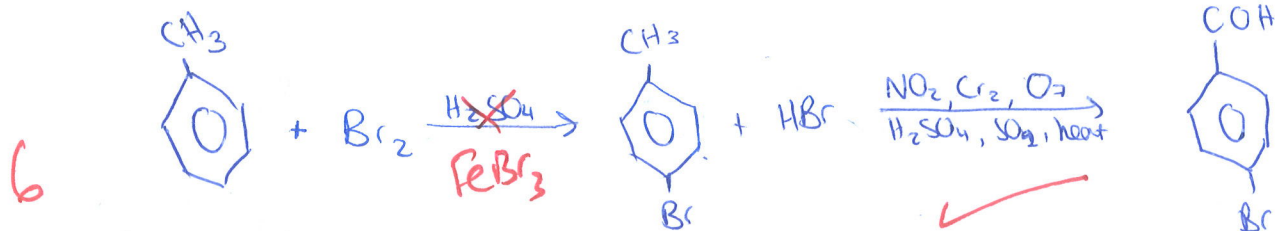


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b) *p*-Bromobenzoic acid from toluene



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Bonus question (5pts) Draw the structure of the final product of the following reactions

