

THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

FIRST SEMESTER EXAMINATION - 2020

CH213 – APPLIED ORGANIC CHEMISTRY

MONDAY 15th JUNE 2020 – 12:50 PM

TIME ALLOWED: 2 HOURS

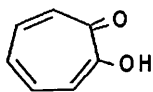
INFORMATION FOR CANDIDATES:-

1. You will have 10 minutes to read the questionpaper. You **MUST NOT** begin writing in the answer book during this time
2. **ANSWER ALL QUESTIONS**
3. All answers **MUST** be written on the answer book provided
4. Calculators are permitted in the examination room. Lecture notes, notebooks plain papers and textbooks are **NOT** allowed
5. Mobile phones are not allowed. **SWITCH OFF THE MOBILE PHONES**
6. Show all workings and calculations in the answer book.
7. **DRAW the STRUCTURES** clear and visible
8. **DO NOT** over write
9. Write your name and number clearly on the front page. **DO IT NOW**

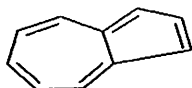
MARKING SCHEME: Total 50 marks

1. Write the commercial name of the following compounds:

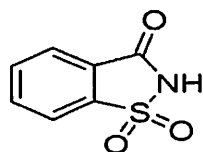
(a)



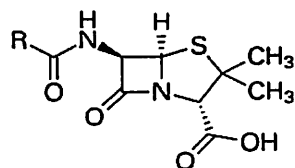
(b)



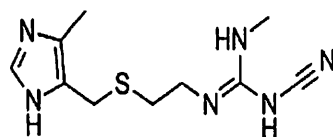
(c)



(d)



(e)



(5 marks)

2. Draw the various canonical structures of pyrrole.

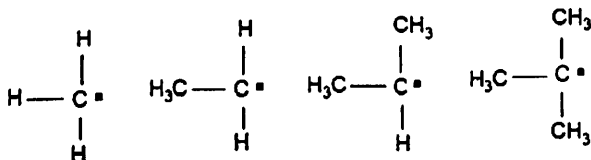
(5 marks)

3. Write chemical equations for the following conversions:

- (a) Hydrolysis of epoxyethane.
 (b) Friedel-Crafts acylation in furan.

(5 marks)

4. (a) What are the structural features of carbon free radicals?
 (b) Predict the increasing order of stability of the following carbon free radicals and give reason why?



(5 marks)

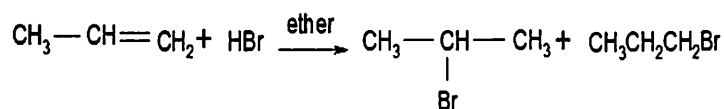
5. Explain the following with suitable examples and give reasons why?

- (a) Alkyl halides are more reactive than parent alkanes.
 (b) Strength of carboxylic acids increases with increase in the electronegative atoms attached to the α - carbon.

(5 marks)

6. (a) Define the "Hoffman rule" with respect to alkyl halides. [1 Mark]

(b) Explain the mechanism of the following reaction:



[4Marks]

(Total = 5 Marks)

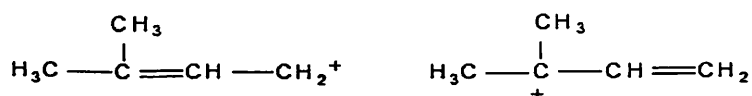
7. How do you convert aliphatic cycloheptatriene into an aromatic compound? Explain with molecular structure and reasons.

(5 marks)

8. a) From the following pair of compounds, identify which one is more stable and give reason why?



b) From the following pair of compounds, identify which one will contribute more to the hybridisation and give reason why?



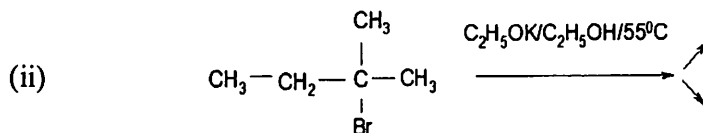
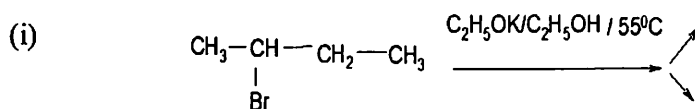
(5 marks)

9. Explain the aromaticity of benzene using molecular orbital theory.

(5 marks)

10. (a) Define "Saytzeff rule". [1 mark]

(b) Predict the products in the following reactions and identify the Saytzeff product in each reaction. [2 + 2 Marks]



(Total = 5 marks)