

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Third semester B.Tech degree examinations (S) September 2020

Course Code: CH207

Course Name: CHEMISTRY FOR PROCESS ENGINEERING- I

Max. Marks: 100

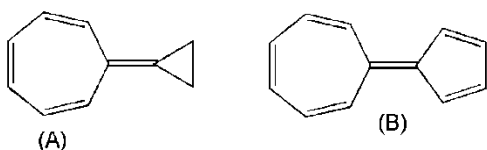
Duration: 3 Hours

PART A

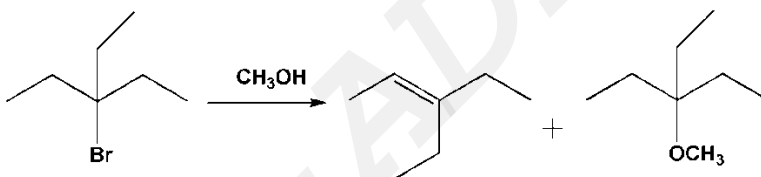
Answer any two full questions, each carries 15 marks.

Marks

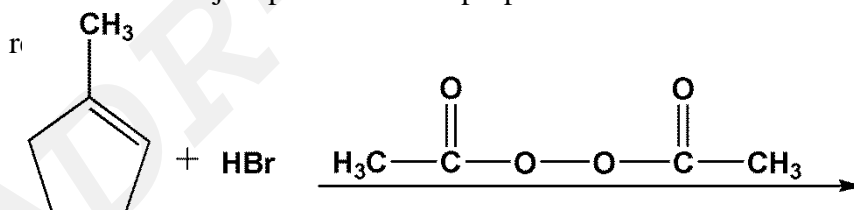
- 1 a) Which of the following should be stabilized by resonance to a greater extent? (3)



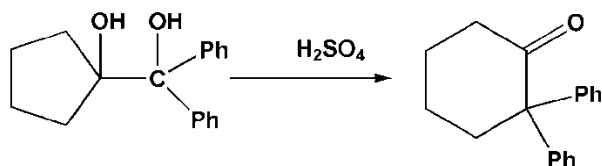
- b) Draw the sigma complexes corresponding to the nitration of aniline at ortho, meta and para positions. Explain the directing effect of $-NH_2$ group. (6)
- c) Propose a mechanism for the following reaction. (6)



- 2 a) Predict the major products and propose a detailed mechanism for the following (6)



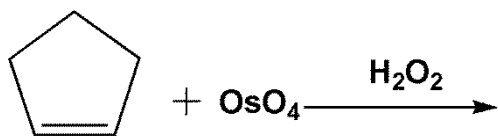
- b) Explain the aromaticity of furan, pyrrole and thiophene. Comment on the basicity of pyrrole. (5)
- c) What are annulenes? Draw the structure and explain the aromaticity of [14]-annulene. (4)
- 3 a) Identify the following name reaction and explain the complete mechanism. (5)



- b) Explain the benzyne mechanism with an example. (5)

c) What are carbenes? Give their classification. Write an example for the cycloaddition reaction involving carbenes. (3)

d) Complete the reaction (2)



PART B

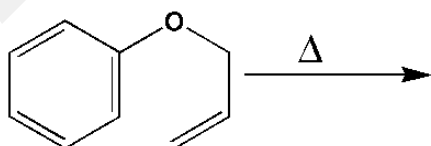
Answer any two full questions, each carries 15 marks.

- 4 a) In aqueous solution, the ratio of α -D-glucopyranose and β -D-glucopyranose is 36:64. Explain the reason with structure? (6)
- b) Write a reaction to distinguish between glucose and fructose. Explain. (3)
- c) What is hydrogenation of oils? What are its drawbacks? (3)
- d) Write the reaction of glucose with a) Excess of phenyl hydrazine, H^+ b) Tollens reagent. (3)
- 5 a) Explain the synthesis and uses of Congo red and Fluorescein dyes. (5)
- b) Show how would you use a Strecker synthesis to make alanine. (5)
- c) What are zwitter ions? (2)
- d) What are biodegradable polymers? Give two examples. (3)
- 6 a) Explain the synthesis and any two uses of pararosaniline. (5)
- b) Explain the denaturation of proteins with an example. (4)
- c) What are detergents? What are its advantages over soaps? (3)
- d) What are artificial sweeteners? Explain the synthesis of sorbitol. (3)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Explain the different photophysical processes with the help of Jablonski diagram? (8)
- b) Illustrate the following i) mechanism of photosynthesis ii) [2+2] cycloaddition (7)
- c) Give the product formed of the following reaction. (3)



- d) What are prodrugs? Discuss its importance. (2)
- 8 a) Explain the classification of enzymes based on their function. (5)
- b) What are antibiotics? Discuss any two types of antibiotics? (4)
- c) Explain the chemistry of bioluminescence in fire fly? What is meant by photosensitisation? (6)

- d) What is ascorbic acid? Explain the mechanism of antioxidant property of ascorbic acid? (5)
- 9 a) Draw the structure of Vitamin A and describe its functions. (4)
- b) What are the key steps involved in the drug designing process? What is QSAR in drug design? (10)
- c) Propose the products formed for the following reaction. Explain with the help of detailed mechanism. (6)

