

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
 TEST -3 EXAMINATIONS-2022
 B.Tech-III Semester (BT)

COURSE CODE (CREDITS): 18B11BT314 (3)

MAX. MARKS: 35

COURSE NAME: GENERAL CHEMISTRY

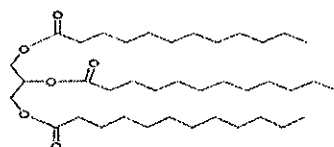
COURSE INSTRUCTORS: DR. GOPAL SINGH BISHT

MAX. TIME: 2 Hour

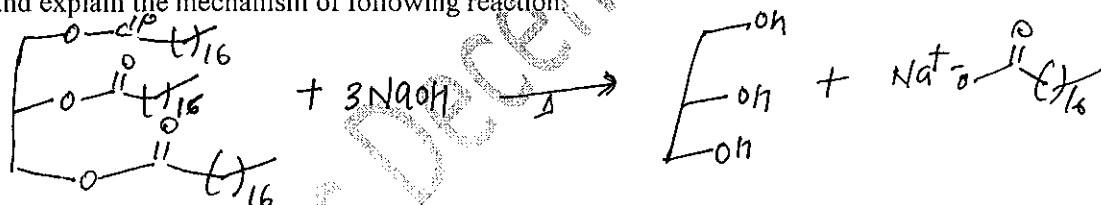
Note: All questions are compulsory. Marks are indicated against each question in square brackets. This question paper contains two pages.

Q1. Answer/ Explain the followings.

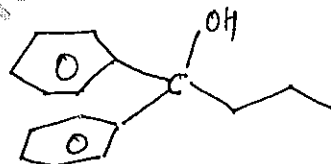
- a) Hydride ion (H⁻) does not function as nucleophile even though it has negative charge. [CO II] 10
- b) Write reaction to show production formation when the molecule A: (give below) Reacts with excess methanol in presence of acidic medium.



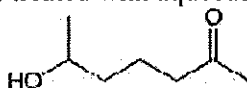
- c) Draw and explain the mechanism of following reaction.



- d) Design synthesis of compound a using appropriate reagents.

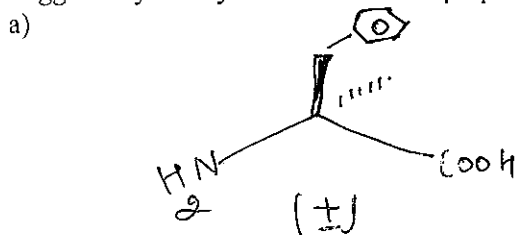


- e) Draw the cyclic hemiacetal that is formed when each of the following bifunctional compounds is treated with aqueous acid.



- Q2. a) Calculate amount of HCl required to prepare 150 ml of 5.0 M HCl from a concentrated solution that has specific gravity of 1.18 and is 36% (w/w) HCl (36.5g/mol) [4] [COV]
- b) When 0.150 g of penicillamine is dissolved in 20.0 mL of pyridine and placed in a sample cell 10.0 cm in length, the observed rotation at 20°C (using the D line of sodium) is -0.47°. Calculate the specific rotation of penicillamine.

Q3. Suggest any one synthetic method to prepare following Amino acids [2] 9



b. Draw a bond-line structure of the peptide that corresponds with the following sequence of amino acid residues and identify the N-terminus and C terminus

Ala-Phe-Gly-Phe-Ala

[2]

c. Why rotation along peptide bond is restricted? Explain.

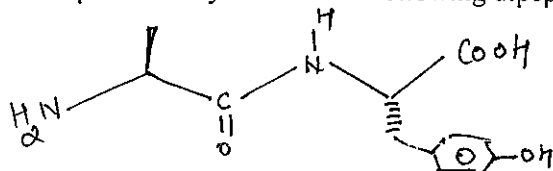
[1]

d. What happens to amino acid structure a) When an amino acid is dissolved in a solution at a pH of 1 b) When an amino acid is dissolved in a solution at a pH of 13

[2]

e. Show all steps necessary to make the following dipeptides selectively.

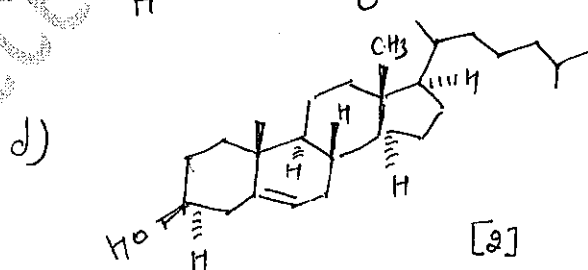
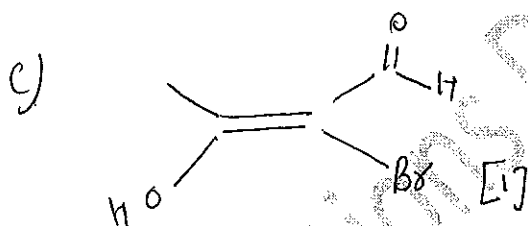
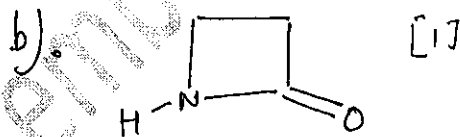
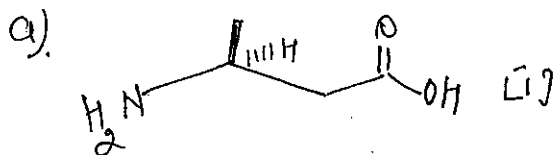
[2]



Q4. Give systematic name of following compounds. Identify the stereogenic centre present in compounds and how many stereoisomers possible (assign R/S or E/Z wherever required).

[5]

[CO11]



Q5. Draw mechanism/appropriate arrows to explain following conversation.

[7]

[COIV]

- In presence of base, D glucose may be converted into D-Mannose. Explain product formation by drawing appropriate arrows [2]
- Fructose closes on itself to form furanose ring [1]
- Mutarotation [2]
- Reaction of β -D glucose with excess methyl iodide in presence of silver halide [2]