

M. Sc. (CHEMISTRY) EXAMINATION, 2022

(4th Semester, CBCS)

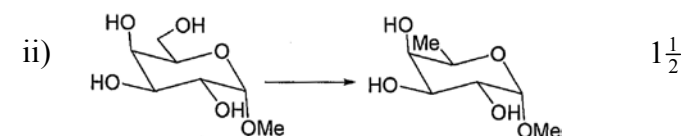
ORGANIC CHEMISTRY SPECIAL**PAPER – XV-O**

Time : Two hours

Full Marks : 40

(20 marks for each unit)**Use a separate answer script for each Unit.****UNIT: O-4151**Answer *any four* of the following questions: 5×4

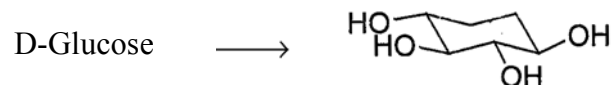
1. a) Outline a synthetic pathway for preparation of α -(1 \rightarrow 6)-linked-D-Manp based **trisaccharide** as its **aminopentyl glycoside utilizing Merrifield resin**. 5
- b) Starting with the corresponding native sugars synthesize the disaccharide : β -D-GlcpNAc-(1 \rightarrow 4)- α -D-Galp-1-OMe **using orthogonal anomeric leaving groups in the glycosyl donor and glycosyl acceptor in the first glycosylation step**. 5
- c) Carry out the following transformation :



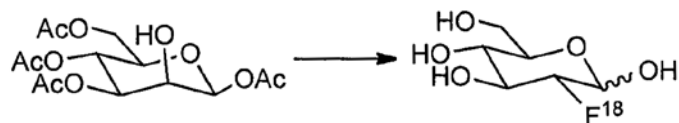
[Turn over

[2]

- d) Carry out the following multistep conversion: 5



- e) i) Carry out the following transformation and also mention **one use** of the fluorinated compound for diagnostic purpose: $1\frac{1}{2} + \frac{1}{2}$



- i) Depict the probable mechanistic pathway for formation of glycosyl chloride from glycosyl acetate, and give a supportive evidence in favor of the probable mechanism. $2\frac{1}{2}$
- ii) Depict the open chain structure of 6-acetamido-3,6,9-trideoxy-D-glycero-L-manno-non-2-ulose. $\frac{1}{2}$

UNIT: O-4152

2. Answer the following questions:

- a) Draw the chemical structures of Vitamin A and its parent compound. How vitamin A is obtained from its parent compound? Presence of adequate amount of vitamin A improves the low-light visibility — Justify the statement with mechanistic details.

1+1+2

[3]

- b) Why Biotin and lipoic acid are considered as vitamins? Draw their chemical structures and their connectivity with protein. Describe with suitable mechanism the biochemical function of lipoic acid in presence of vitamin B1 and FAD. $\frac{1}{2} + 1\frac{1}{2} + 2$
- c) The bio-chemical function of vitamin B₉ is “transfer of one carbon unit” — justify this statement with suitable example (any one) and mechanism. 2
3. a) Discuss with mechanism why penicillin antibiotics are called bactericidal antibiotics. Why penicillin antibiotics are selectively toxic to bacteria but not to human? 3+1
- b) Phenoxymethylpenicillin is an orally administrable drug, but benzylpenicillin is not. Justify the statement. 2
- c) Give an example of an organic DNA crosslinking agent and explain its mechanism of action. 2
- d) Discuss different modes of binding of organic small molecules with DNA through non-covalent interactions. 2