

(7 pages)

**MAY 2015**

**P/ID 40130/PCHK**

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Time : Three hours

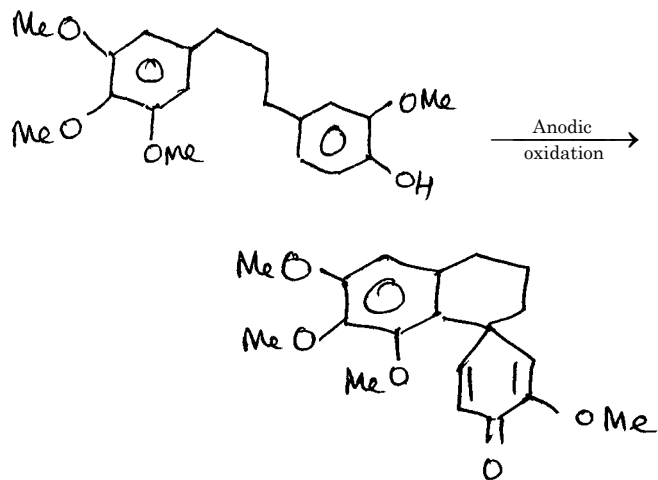
Maximum : 100 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1. What is hyper chromacity?
2. Indicate the step in which 'cholesterol lowering drugs' interfere during the biosynthesis of cholesterol.
3. What is the chemical nature of the resin normally employed for Merrifield synthesis?
4. Illustrate anhydride method of peptide synthesis with an example.
5. Explain the stereospecificity associated with Diels Alder reaction.

6. What are the common reagents employed to protect amino groups?
7. Compare the reactivity of the sulfur ylide and phosphonium ylide.
8. Distinguish between electrophilic radical and nucleophilic radical.
9. Illustrate Wohl Ziegler bromination with an example.
10. Write the mechanism for the following conversion :



PART B — (4 × 20 = 80 marks)

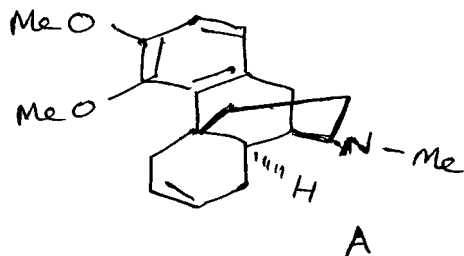
Answer ALL questions.

11. (a) Discuss the structure and role of RNA and DNA.

Or

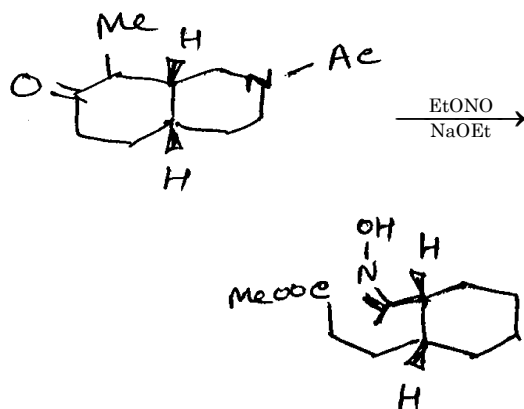
- (b) (i) Indicate how the synthesis of mevalonate is achieved from acetyl CoA.
- (ii) What are the steps involved in the conversion of lanosterol to cholesterol.
- (iii) Outline the biosynthetic route to cholic acid. (5 + 5 + 10)
12. (a) (i) Explain the importance of X-ray analysis, viscosity measurement and electron microscope in detecting the tertiary structure of proteins. Highlight the role of NOESY NMR spectra in revealing the spatial relationship of groups.

- (ii) Explain how optically active (+)-A, obtained by the degradation of thebaine, can be employed for the synthesis of morphine. (12 + 8)



Or

- (b) (i) Explain the mechanism for the following step :



(ii) Explain how cocaine can be synthesised involving an initial three component reaction.

(iii) Establish the synthetic route to reserpine. (6 + 6 + 8)

13. (a) Indicate the importance of the following reagents in organic synthesis :

(i) DIBAL

(ii) 9-BBN

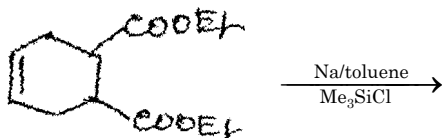
(iii) DCC. (7 + 7 + 6)

Or

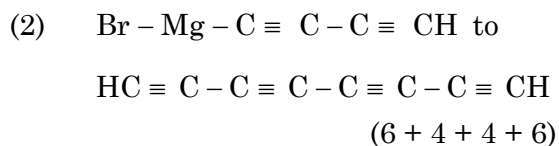
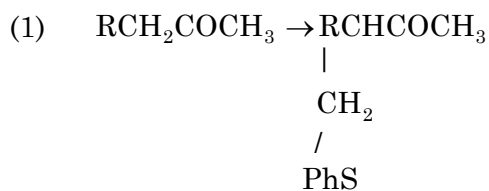
(b) (i) Compare the advantages and disadvantages of trimethylsilyl chloride with those of trimethylsilyl iodide and trimethylsilyl triflate.

(ii) How does trimethylsilyl chloride react with 2-methylcyclohexanone in presence of (1) LDA and (2) triethyl amine.

- (iii) Write the product of the following reaction with mechanism



- (iv) Explain how trimethylsilyl chloride can be used for the following conversions :



14. (a) (i) Explain how the different rings are generated in cubane.
- (ii) Discuss in detail, the Hunsdiecker method of preparing alkyl halides and the Sandmeyer method of preparing aryl halides. Describe their scope and mechanism.

- (iii) Write down the products when RCOOAg is allowed to react with iodine in (1) 1 : 1 ratio and (2) 2 : 1 ratio. Provide the mechanism for each conversion. (8 + 8 + 4)

Or

- (b) (i) Explain how long lived and short lived free radicals are generated? Indicate the methods of detecting the free radicals with special emphasis to ESR and CIDNP.
- (ii) Discuss the mechanism and the scope of Ullmann reaction and Pschoor reaction. (12 + 8)
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