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Roll No.....

CHE-553
Natural Products, Heterocyclic and
Spectroscopy

M.Sc. CHEMISTRY (MSCCH - 12/13/16/17)

Second Year, Examination-2019

Time: 3 Hours

Max. Marks: 80

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Note:- This paper is of Eighty (80) marks divided into two (02) Section A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

Section-A

(Long Answer Type Questions)

Note:- Section - A contains five (05) long answer-type questions of fifteen (15) marks each. Learners are required to answer any three (03) questions only. (3×15=45)

1. What do you understand by ORD? How it is different from CD. Discuss analytical application of ORD technique.
2. Describe stepwise in detail.
 - (a) Acetate/Malonate pathway
 - (b) Shikimic acid pathway

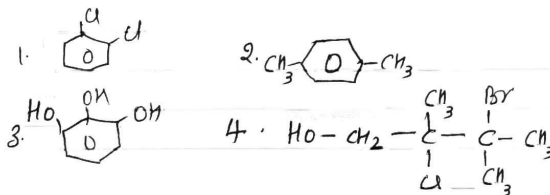
Discuss examples of secondary metabolites formed in above pathways.
3. What are alkaloids? Explain
 - (a) Functions and properties of alkaloids
 - (b) Methods of Isolations of alkaloids
4. Describe in brief:
 - (a) INEDQUATE experiment in C^{13} -NMR
 - (b) F^{19} and P^{31} NMR
 - (c) DEPT Vs Double resonance
5. Discuss structures and synthesis of:
 - a. Quinoline
 - b. Indole
 - c. Pyridine
 - d. Dioxane
 - e. Pyrrol

Section-B

(Short Answer Type Question)

Note:- Section-B contains eight (08) short answer type questions of seven (07) marks each. Learners are required to answer any five (05) questions only. (5×7=35)

1. What are prostaglandins? Discuss their biological importance with structure of at least two PGs.
2. (a) What are Co-factors and Co-enzymes? Describe in brief.
(b) Explain the key and lock model and induced fit model for the mechanism of enzymes.
3. (a) Describe the basicity order of furan, thiophene and pyrrole?
(b) Describe why lone pair of electrons on nitrogen of pyridine do not take part in resonance.
4. (a) Predict the number of proton – decoupled signals in the following organic molecules.



- (b) How C^{13} – NMR signals are obtained?
How NOE is associated with C^{13} – NMR?
5. Explain with end products, the metabolism of fatty acids and proteins.
 6. Draw the structures of haemoglobin and myoglobins. Explain their difference and functions.
 7. Write short note on :
 - a. Vitamins
 - b. 4–membered heterocyclic compounds
 - c. Rotenoids.
 8. Explain the significance of heterocyclic compounds as: Antibiotics, Antimicrobial and other biological activities.
