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MSCCH-12 (M.Sc. Chemistry)

Second Year, Examination-2015

CHE-553

Natural Products, Heterocyclic Chemistry, Biogenesis and Spectroscopy

Time : 3 Hours **Maximum Marks :** 60

Note : This paper is of sixty (60) marks divided into three (03) sections A, B, and C. Attempt the questions contained in these sections according to the detailed instructions given therein.

Section - A

(Long Answer Type Questions)

Note : Section 'A' contains four (04) long-answer-type questions of fifteen (15) marks each. Learners are required to answer any two (02) questions only. (2×15=30)

1. (a) Establish the structure of PG $E_1\alpha$ by using chemical, IR and ^{1}HNMR spectral data.

   (b) Write a brief note on porphyrins.

   (c) Write a short note on glycolysis.

2. Write short notes on :

   (a) Factors affecting enzyme catalysis.

   (b) Fatty acid metabolism.

(c) Chemical degradation method and its use in biosynthesis.

(d) Dimorth rearrangement

(e) Physiological importance of prostaglandins.

3. (a) Formulate two methods for the synthesis of Isoxazole.

(b) How caffeine is synthesised form Uric and ?

(c) How will you synthesise aziridine ?

4. (a) Explain PET method of recording of ^{13}C NMR spectra.

(b) Write short notes on hetro nuclear couplings in ^{13}C NMR

(c) Give application of ^{31}PNMR.

Section - B

(Short Answer Type Questions)

Note : Section 'B' contains eight (08) short-answer-type questions of five (05) marks each. Learners are required to answer any four (04) questions only. (4×5=20)

1. How will you prove the position of double bond and -OH groups in cholesterol ?

2. Explain in brief the NOESY spectra.

3. Giving one example in each case explain :

(a) MOMO 2DJ

(b) HOMOCOR

4. Write down stereochemical structure of reserpine.

5. Discuss the main steps involved in Kreb's cycle.

6. Explain the applications of octant rule.

7. With the use of the provided data etermine the structure of compound given below Molecular for mula C5H ii Cl ^{13}C NMR shows peaks :

(a) δ 13.9 (q) (b) δ 22.1 (t)

(c) δ 29.2 (t) (d) δ 32.5 (t)

(e) δ 44.9 (t)

8. Write down the structure and the disease caused by their deficiency of :

(a) Vitamin B1 (thiamine) (b) Vitamin H

(c) Vitamin C (d) Vitamin D

(e) Vitamin A

Section - C

(Objective Type Questions)

Note : Section 'C' contains ten (10) objective-type questions of one (01) mark each. All the questions of this section are compulsory. (10×1=10)

Choose correct options to answer :

1. Biotin is :

(a) Engyme (b) Vitamin

(c) Protein (d) None of the above

2. Proteins are hydrolysed by enzyme into :

(a) Hydroxy acid (b) Aromatic acids

(c) Amino acids (d) Hormones

3. How many signals will be obtained in ^{13}C NMR of C_3H_6O?

(a) 4 (b) 3

(c) 2 (d) 5

4. Which of the following compound is a Hormone ?

(a) Morphine (b) Ascorbic and

(c) Testosterone (d) Methionine

5. Coagulation of Proteins is called :

(a) Dehydration (b) Denaturation

(c) Diamination (d) Decay

6. In which of the following compounds phenanthrene nucles is present ?

(a) Cholesterol (b) Morphine

(c) Oestrone (d) Tyrosine

7. How many isomeric thiadiazoles are there ?

(a) 3 (b) 4

(c) 5 (d) 2

8. Which comound gives Diel's hydrocarbon by SE dehydrogenation.

(a) Morphine (b) Cholesterol

(c) Calciferol (d) Aspatric acid

9. Proteins aynthesis is helped by :

(a) Cytosine (b) Adenine

(c) Ribose (d) RNA

10. The most important energy carrier in all the living cell is :

(a) AMP (b) ATP

(c) ADP (d) UDP