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A-1295

M. Sc. (Part-I) (Sem.-I) Examination

March/April – 2015

Chemistry : Paper - IV

(Instrumental & Chemical Analysis)

(Regular & Evening)

Time : **3** Hours] [Total Marks : **70**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **M. Sc. (Part-I) (Sem.-I)**

Name of the Subject :

☛ **Chemistry : Paper - IV**

☛Subject Code No. : **1 2 9 5** ☛Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) All questions are compulsory.

(3) Figures to the right indicate full marks of the questions.

1 Answers any three of the following : **18**

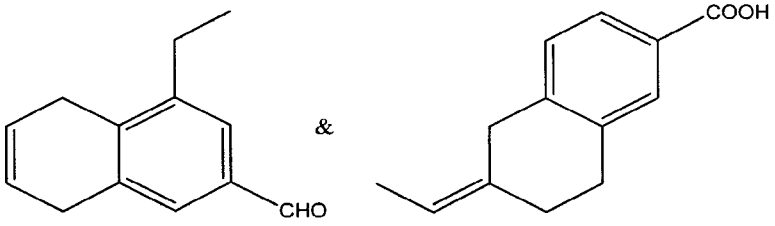
(a) Discuss the basic principle of IR spectroscopy. Explain different sampling methods to scan the IR spectra.

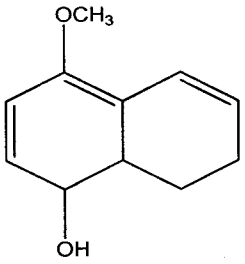
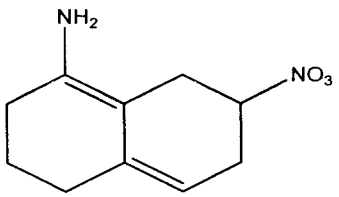
(b) Discuss the importance of UV/Visible spectroscopy to elucidate the organic compounds. How will you differentiate $\pi \rightarrow \pi^*$ and $n \rightarrow \pi^*$ transition? Explain π.

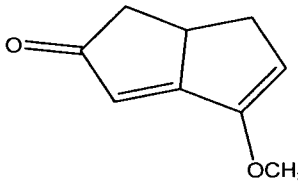
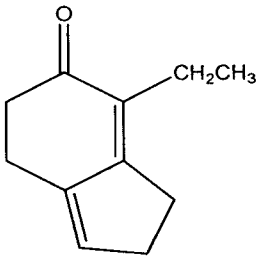
(c) By IR spectral data identify bands in hexyl amine and ethyl benzoate, n-butyl acetate and ethyl benzoate and n-butylmethyl ether and hexanone.

(d) Calculate the λ_{max} and compare the following compounds :

(i)



(ii)  & 

(iii)  & 

2 Answer any three of the following : 18

(a) Explain the terms : Zone broadening, retention time, retention factor and distribution constant in chromatography.

(b) What are porous polymers? Explain in detail about porous polymers in packed column.

(c) What is HPTLC? How this technique is useful in separation of compounds? Explain.

(d) What do you mean by WCOT and SCOT? Give advantages and disadvantages of WCOT and SCOT.

3 Answer any three of the following : 18

(a) The percentage of a copperin a coin were found to be 19.23, 19.34, 19.29, 19.11 and 19.39. Calculate the mean, median, range, relative error, average deviation, standard deviation.

(b) Write a short note on rejection criteria and student's T test.

(c) (i) Describe in detail : method of least square.

(ii) A random sample of 200 1st year statistics tutorials was selected from the past 5 years and the number of students absent from each one recorded. The results were $\bar{x}=10.1$ and S = 3.8 absences. Estimate the mean number of absences per tutorial over the past 5 years with 90% confidence. Value for 90% confidence is 1.645.

(d) What is error? Give its classification in detail.

4 Answer any four of the following : **16**

(a) (i) Explain the derivatization in GC.

(ii) Why temperature programming is need in GC? Explain.

(b) Give the range of vibrational spectral regions of IR and discuss the different stretching vibrations in IR spectra.

(c) Explain with suitable example confidence limit and probability.

(d) Compare the merit and demerits of ECD and TCD.

(e) Calculate the λ_{max} of the following compounds :