EASTERN UNIVERSITY, SRI LANKA

SECOND EXAMINATION IN SCIENCE

SECOND SEMESTER – 2013/2014 (October/ November 2016)

CH 203 SPECTROSCOPIC METHODS

(Proper)

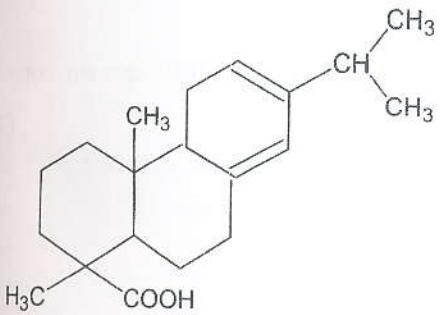
Answer all questions **Time allowed: ONE Hour**

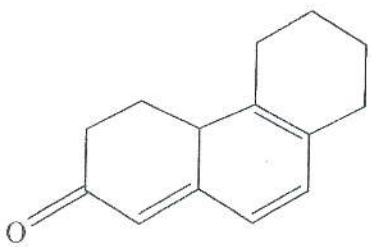
1.

a) Briefly describe the UV-Visible Absorption Spectroscopy with suitable diagram

(20 Marks)

b) Calculate the λ_{max} values for the following compounds using Woodward-Fieser rules



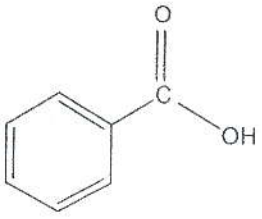


(20 Marks)

c) "Number of IR absorption bands of a molecule depends on the symmetry property of a molecule". Explain this statement with suitable diagram/s

(20 arks)

d) IR spectrum of the benzoic acid (structure is shown in below) shows major a bands at ϑ/ cm^{-1} 3030, 3000 – 2500 (broad band), 1740, 1600, 1300 and 85 Interpret the data to the respective vibrations of the molecule



Benzoic Acid

(1

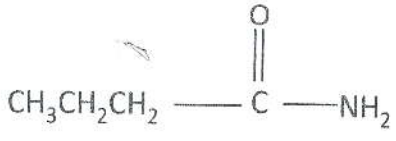
e) IR Spectrum of a compound A (Molecular Formula $C_7H_6O_3$) shows absorptio at (cm^{-1}) 3600, 3400, 3050, 2950, 1700, 1650, 1300 and 850. ^{1}HNMR spectru same compound shows the signals at (δ/ ppm) 10.8 (s, 1H), 11.2 (s, 1H) and 7 2H) and 6.8 (dd, 2H). Interpret the data and deduce the structure of the compo

(2

2. a) Write down short notes on Nuclear Relaxation Process in NMR spectroscopy.

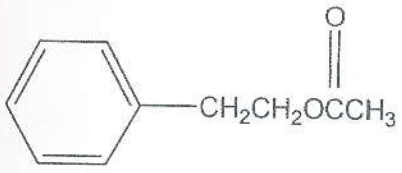
(2

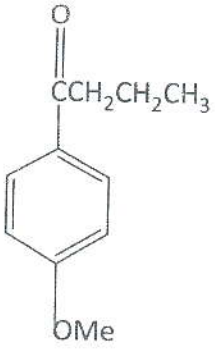
b) Sketch the ^{1}H NMR spectrum of the compound shown below

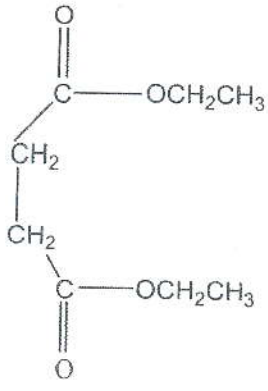


(25

c) Give the number of ^1H NMR signals that could be observed for the following compounds







(30 Marks)

d) The mass spectrum of butane showed the fragments ions at m/z 43, 29 and 15. Give the structure of these ions and indicate the possible pathways for their formation.

(25 Marks)

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