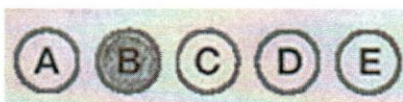
	<b>Tanta University, Faculty of Pharmacy</b>			
	<b>Department Of Pharmaceutical Analytical Chemistry</b>			
	Examination For 5 <sup>th</sup> Level Clinical Pharmacy Students			
	Course Title: <b>Advanced Pharmaceutical Analysis</b>		Course Code: <b>PC E12</b>	
Date: <b>27/6 /2021</b>	Term: <b>Second</b>	Marks: <b>50</b> Total pages: <b>7</b>	Time Allowed: <b>120 minutes.</b>	

- Check that your exam booklet consists of (7) pages.
- Choose **ONE** best answer for each question and mark it in the separate answer sheet (pink bubble sheet). **Answers anywhere else will not be marked.**
- **Instructions for using bubble sheet:**
  1. At the top section of the bubble sheet, write your name and your academic number.
  2. **Each bubble on the sheet stands for one answer.** Fill in the bubble completely, but do not make stray marks outside of the bubble.



The right way to fill in the bubble sheet

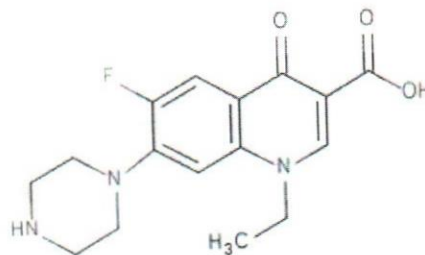
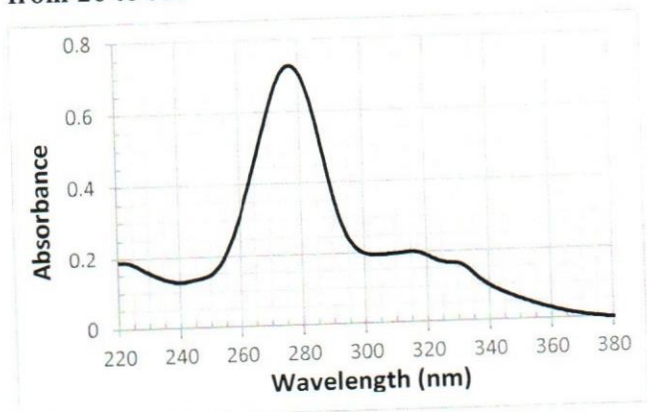
*Don't stress, Do your best.  
Best wishes in the Exam*







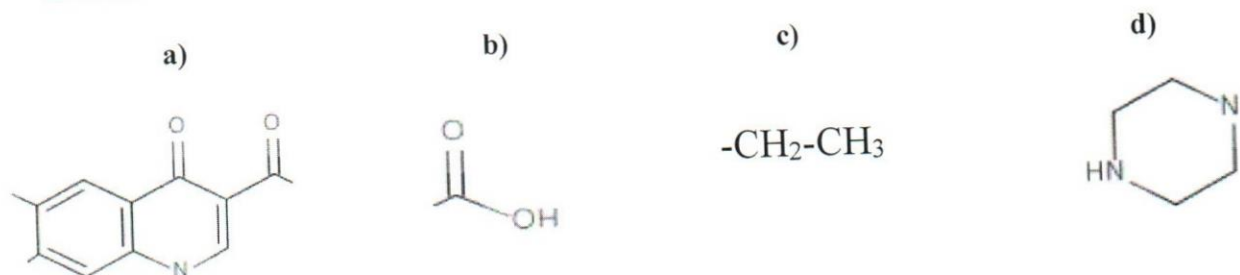
Regarding the structure and the spectrum of norfloxacin antibiotic, answer questions from 26 to 33.



26. The shown spectrum of norfloxacin represents a/an ..... spectrum.

- a) IR                                      b) NMR                                      c) UV                                      d) Vis

27. Please select the part of the structure that represents ALL chromophoric groups in norfloxacin



28. Which of the following represent an auxochrome in norfloxacin?

- a)  $-\text{F}$                                       b)  $-\text{CH}_3$                                       c)  $-\text{C}=\text{O}$                                       d) phenyl ring

29. The possible type(s) for transition(s) in norfloxacin that is/are responsible of the previous absorption spectrum is/are.....

- a)  $\sigma-\sigma^*$                                       b)  $\pi-\pi^*$                                       c)  $n-\pi^*$                                       d)  $\pi-\pi^*$  and  $n-\pi^*$

30.  $\lambda_{\text{max}}$  for norfloxacin is ..... nm.

- a) 240                                      b) 277                                      c) 300                                      d) 360

31. Which of the following is the quantitative parameter in this type of spectroscopic technique?

- a) Absorbance                                      b) Molar absorptivity                                      c)  $\lambda_{\text{max}}$                                       d) Path length

32. The specific absorbance for norfloxacin at  $\lambda_{\text{max}}$  equals 1216.66.

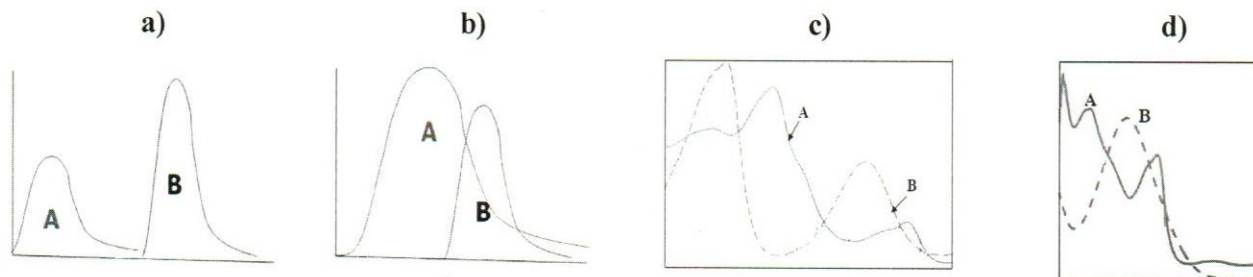
(N.B., The molar absorptivity ( $\epsilon$ ) at  $\lambda_{\text{max}} = 38933 \text{ L/mol.cm}$  and the molecular weight of norfloxacin = 320)

- a) True                                      b) False

33. Which of the following solvents CANNOT be used while recording the previous spectrum of norfloxacin?

- a) Benzene                      b) cyclohexane                      c) methanol                      d) water

34. The figures below describe the overlay spectra of two drugs; A and B. Which one represents that classical UV spectral measurement can be used for assay of A and B?

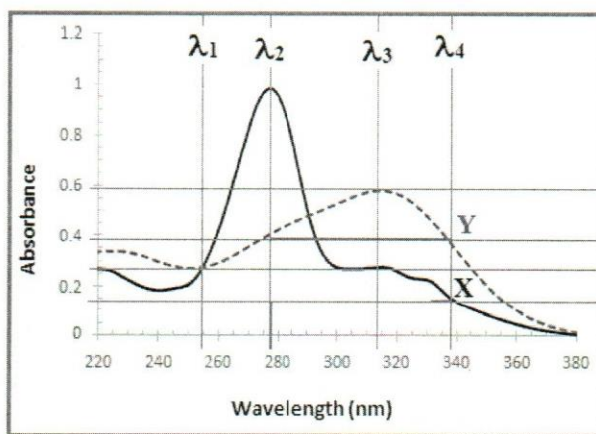


Match each multicomponent spectrophotometric method (questions 35, 36, 37) to (a, b, c or d).

35.	<u>Vierordt's method</u>
36.	<u>Dual wavelength method</u>
37.	<u>Derivative spectrophotometry</u>

a)	Depends on measuring the absorbance at the isosbestic point.
b)	Simultaneous equation method.
c)	Reduced the effects of interferences from scattering, matrix or baseline.
d)	Depends on measuring the absorbance difference between two points in the mixture spectrum.

The following overlay spectrum represents the UV spectra of two drugs: X (—) and Y (- - -). A dual wavelength method was developed for the simultaneous determination of X and Y in their fixed dose tablet dosage form. Please answer questions from 38 and 39.



38. Beer's expression for a binary mixture of X and Y at  $\lambda_2$  can be presented by the equation.....

- a)  $A_{mix} = a_x b c_x$                       b)  $A_{mix} = a_y b c_y$   
 c)  $A_{mix} = a_x b c_x + a_y b c_y$                       d)  $A_{mix} = a_x b c_x * a_y b c_y$

39. Using dual wavelength method, which wavelengths are suitable for determination of X?

- a)  $\lambda_1$  and  $\lambda_2$                       b)  $\lambda_2$  and  $\lambda_3$                       c)  $\lambda_1$  and  $\lambda_3$                       d)  $\lambda_2$  and  $\lambda_4$

Conaz<sup>®</sup> tablets contain norfloxacin (antibiotic) and tinidazole (antiprotozoal agent) for treating GI infection. The spectral data of the two components in 0.1 M HCl solution are given below.

$\lambda(\text{nm})$	$A_{1\text{cm}}^{1\%}$ in 0.1N HCl	
	Norfloxacin	Tinidazole
277	1230	0
314	190	240

The tablets were grind, dissolved in 0.1N HCl, filtered and diluted. The absorbance was measured for the tablet assay solution, using 1-cm cell, at each wavelength and was found to be  $A_{277\text{nm}} = 1.39$  and  $A_{314\text{nm}} = 0.85$ . Answer questions 40 and 41.

40. The concentration of norfloxacin in diluted tablet solution is ..... g%.

- a) 0.001                      b) 0.038                      c) 0.003                      d) 0.089

41. The concentration of tinidazole in diluted tablet is ..... g%.

- a) 0.001                      b) 0.038                      c) 0.003                      d) 0.089

42. The Third derivative spectrum (<sup>3</sup>D) .....

- a) passes through zero at the wavelength representing  $\lambda_{\text{max}}$  in <sup>0</sup>D.  
b) does not contain satellite bands.  
c) contains bands with decreased bandwidth compared to <sup>0</sup>D.  
d) all the above.

43. Which of the following represents a disadvantage of derivative spectrophotometry (DS) ?

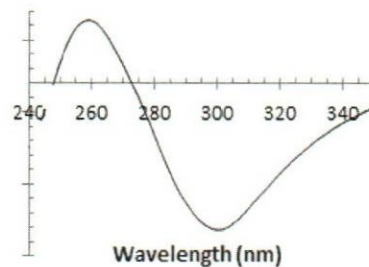
- a) DS can be used for characterization and qualitative determination of compounds.  
b) DS extracts useful spectral data from turbid solutions.  
c) DS corrects baseline shift.  
d) DS shows low S/N ratio with increasing derivative order.



The following represents a derivative UV spectrum of a new anticancer drug. Answer question from 44 to 46.

44. The figure represents a .....derivative spectrum.

- a) First                                      b) second  
c) third                                        d) fourth



45. The expected  $\lambda_{\text{max}}$  for the compound is ..... nm

- a) 260                      b) 272                      c) 300                      d) 350

46. Quantitation of the compound can be done by measuring amplitudes at ..... nm.

- a) 260                                      b) 300                                      c) 260 to 300                                      d) a, b and c

The figure represents a derivative UV spectrum of a compound (M).

Match each question (47 to 50) to (a, b, c or d).

47. Minima

48. Zero-crossing point

49. Satellite bands

50. Position of  $\lambda_{\text{max}}$

