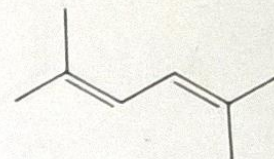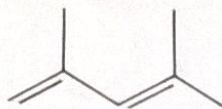# PROBLEMS

10-1[1] Calculate λ_{max} for the following and explain the lower ϵ_{max} for the middle diene.
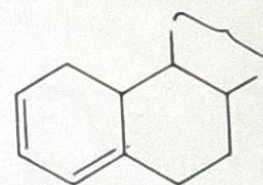
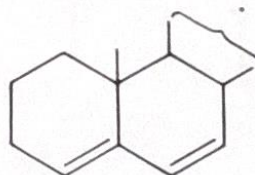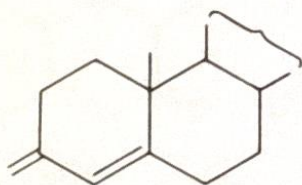|			
Observed λ_{max} (nm)	217	228	241
ϵ_{max}	21,000	8500	23,000

10-2[1] Calculate λ_{max} for the following.

a.

Observed λ_{max} (nm)	239	235	275
ϵ_{max}	17,300	19,000	10,000

b.
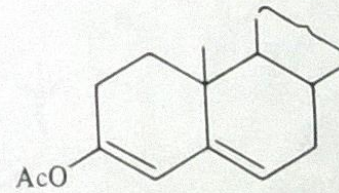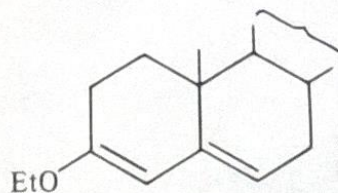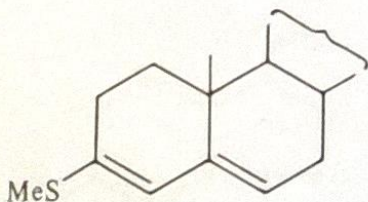
Observed λ_{max} (nm)	268	241	235
ϵ_{max}	22,600	22,600	19,000

[1] Observed data from A. I. Scott, *Interpretation of the Ultraviolet Spectra of Natural Products*, New York, 1962.

c.

(handwritten, top right margin) criterio! opción que de' la mayor contribución. en ningún caso se considera extensión de insat.

(handwritten labels on structures) B C P Homoanular Hetero AcO

Observed λ_{max} (nm)   283   285   355

ϵ_{max} 33,000   9100   19,700

(handwritten under middle group)
Homoanular
Base 253
5 res   25
3 exdocicl 15
—————
       293

(handwritten, right group)
Hetero
base 214
4 res. 20
2 exo 10
—————
    244

d.

Observed λ_{max} (nm)   230   241   254

ϵ_{max} 10,000   16,600   9100

e.

Observed λ_{max} (nm)   244   290   292

ϵ_{max} 15,000   12,600   13,000

f.

Observed λ_{max} (nm)   348   348   327
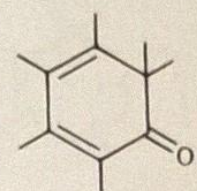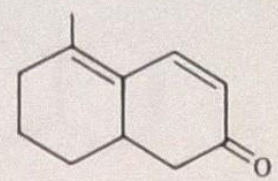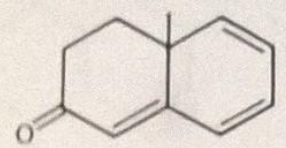
ϵ_{max} 11,000   26,500

10-3 Calculate the $\pi \rightarrow \pi^*$ transition λ_{max} for cholesta-4,6-diene-3-one (A) and its enol acetate (B).
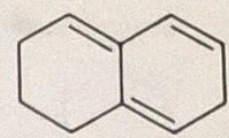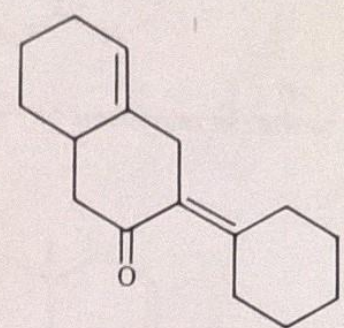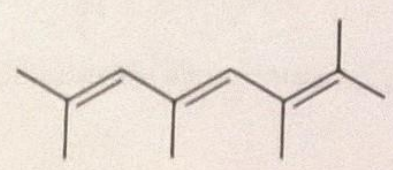
C_8H_{17}

C_8H_{17}

AcO

A   B
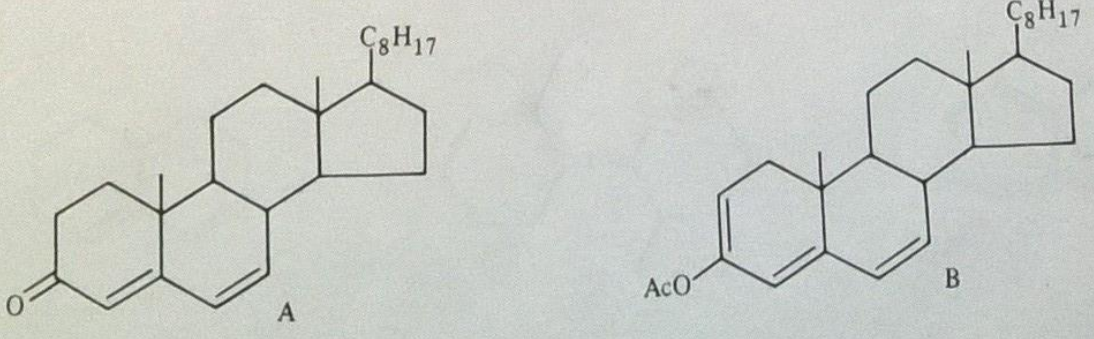
10-4   The compounds below have λ_{max} 303, 274, and 283 nm. Which compound has which absorption?
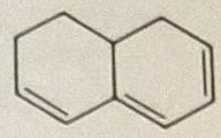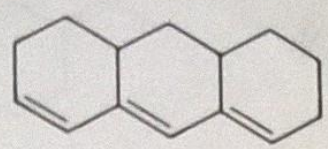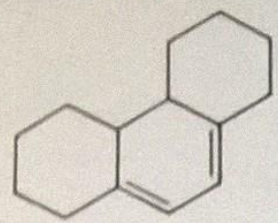
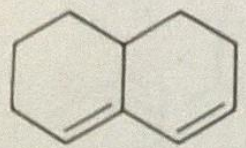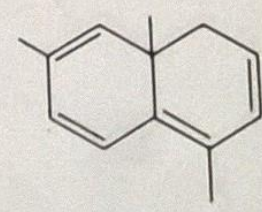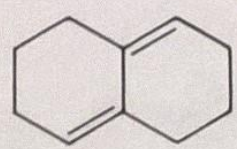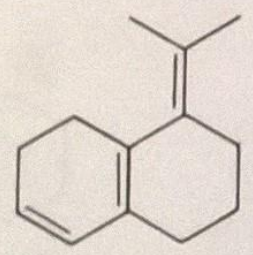**10-5**   The compounds below have λ_{max} at 305, 349, and 360 nm. Which compound has which absorption?
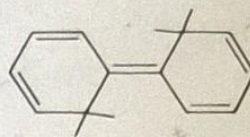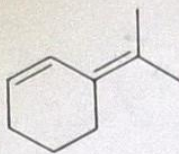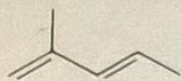

10-6   What UV-vis λ_{max} would you predict for the $\pi \rightarrow \pi^*$ transitions of the following compounds?

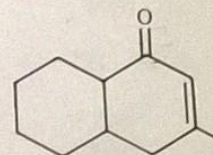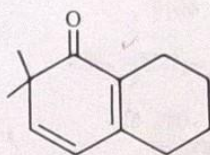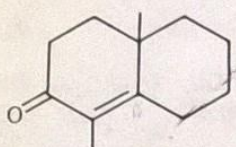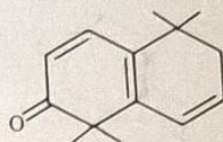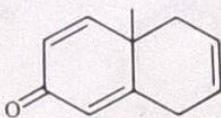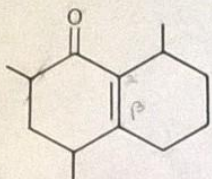**10-7**   The following polyenes have ϵ_{max} values of 382, 294, 249, 318, 234, and 244 nm. Assign the λ_{max} to each structure.
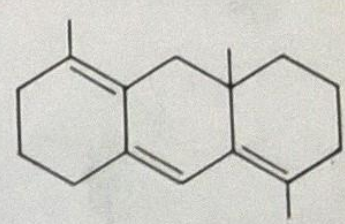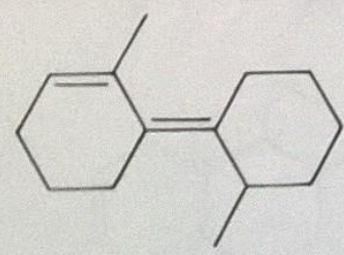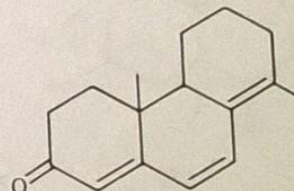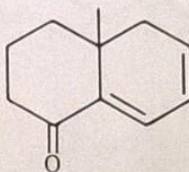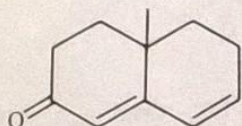
10-8   Calculate the approximate λ_{max} for the $\pi \rightarrow \pi^*$ transition of each of the following compounds.
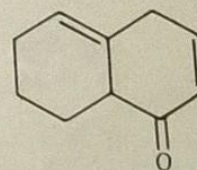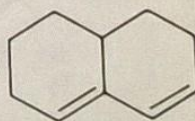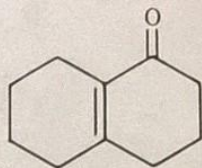
16-9   The following unsaturated ketones have λ_{max} values of 254, 239, 280, 249, 244, and 407 nm. Assign the λ_{max} to the structure.

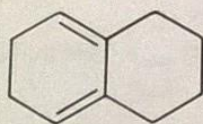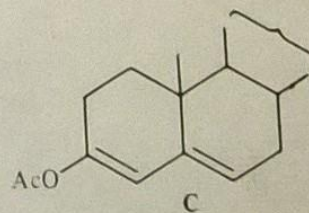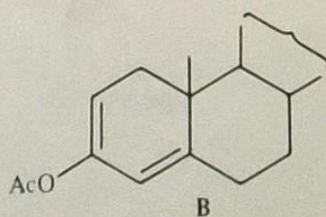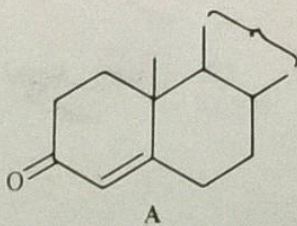**10-10**   Calculate the approximate λ_{max} for the $\pi \rightarrow \pi^*$ transitions of each of the following compounds.
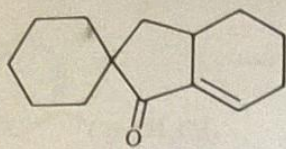
10-11   The following compounds absorb at 283, 227, 234, and 249 nm. Which compound has which absorption?
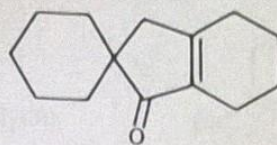
10-12   An enol acetate of cholest-4-ene-3-one (A) is prepared and has $\lambda_{max} = 238$ nm with log $\epsilon_{max} = 4.2$. Is the enol acetate B or C?

A   B   C

10-13 Spiroenones were prepared of structures A and B. One showed an intense λ_{max} at 247 nm, the other at 241 nm. Assign the structures.
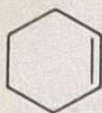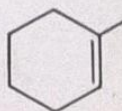
A   B

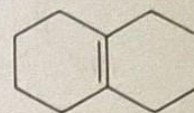**10-14** Account for the following observations.

a.

Observed	λ_{max} (nm)	183	188	200
	ϵ_{max}	7500	7100	8900
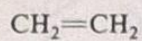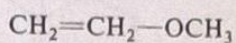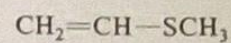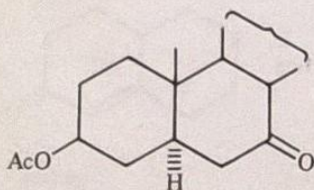
b. $CH_2{=}CH_2$ $CH_2{=}CH_2{-}OCH_3$ $CH_2{=}CH{-}SCH_3$

Observed	λ_{max} (nm)	162.5	190	228
	ϵ_{max}	15,000	10,000	8000

c.

Observed	λ_{max} (nm)	287	313	282
	ϵ_{max}	40	158	40

d.

Observed	λ_{max} (nm)	466	380	298	337	299
	ϵ_{max}	31	11	29	34	34

e.
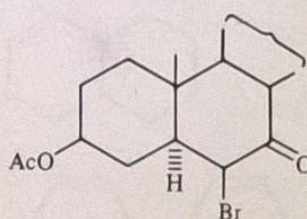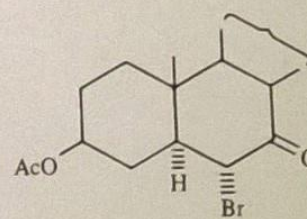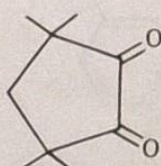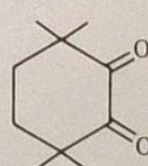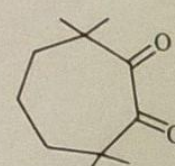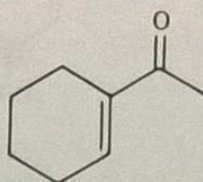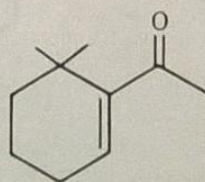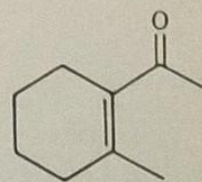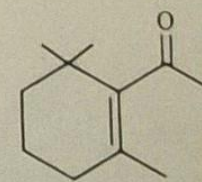
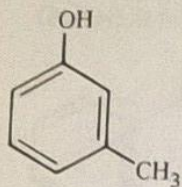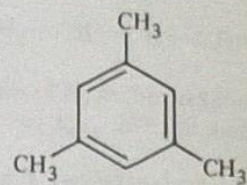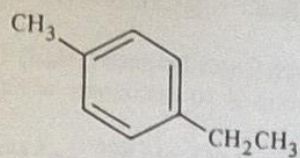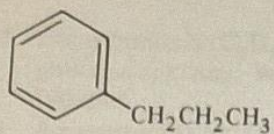| Observed	λ_{max} (nm)	232	232	245	243
	ϵ_{max}	12,500	12,000	6500	1400

10-15   Calculate the λ_{max} for each of the following compounds.
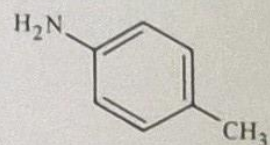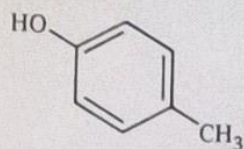
10-16   Predict and explain whether UV–vis spectroscopy can be used for distinguishing members of the isomeric pairs.

a.

 and

b.

 and

c.

 and

d.

 and

e.

 and