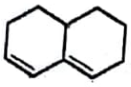
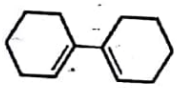
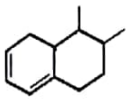
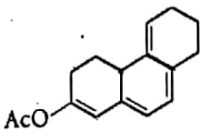
Compound	Answer		
(i) 	Base value (Heteroannular diene)	=	217 nm
	Ring residues 3 × 5	=	15 nm
	Exocyclic double bonds 1 × 5	=	5 nm
	Calc. λ_{max}		237 nm
(ii) 	Base value	=	217 nm
	(Heteroannular diene)		
	Ring residues 4 × 5	=	20 nm
	Calc. λ_{max}	=	237 nm

(iii) 

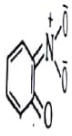
Base value	=	253 nm
(Homoannular diene)		
Substituents 2 × 5	=	10 nm
Ring residues 2 × 5	=	10 nm
Calc. λ_{max}	=	273 nm

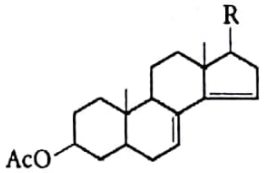
(iv) 

Base value	=	253 nm
(Homoannular diene)		
Ring residues 3 × 5	=	15 nm
Exocyclic double bonds 1 × 5	=	5 nm
Calc. λ_{max}	=	273 nm

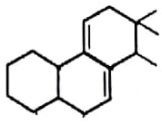
(v) 

Base value	=	253 nm
(Homoannular diene)		
Double bond extending the conjugation 2 × 30	=	60 nm
Ring residues 5 × 5	=	25 nm
–OAc substituent	=	0 nm
Exocyclic double bonds 3 × 5	=	15 nm
Calc. λ_{max}	=	353 nm

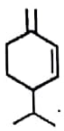


(vi) 

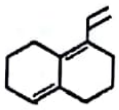
Base value	=	217 nm
(Heteroannular diene)		
Ring residues 4 × 5	=	20 nm
Exocyclic double bonds 2 × 5	=	10 nm
Calc. λ_{max}	=	247 nm

(vii) 

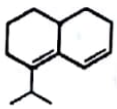
Base value	=	217 nm
(Heteroannular diene)		
Ring residues 4 × 5	=	20 nm
Exocyclic double bonds 2 × 5	=	10 nm
Calcl. λ_{max}	=	247 nm

(viii) 

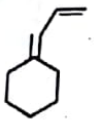
Base value	=	217 nm
(Heteroannular diene)		
Ring residues 2 × 5	=	10 nm
Exocylic double bonds 1 × 5	=	5 nm
Calc. λ_{max}	=	232 nm

(ix) 

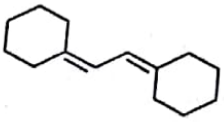
Base value	=	217 nm
(Heteroannular diene)		
Double bond extending		
the conjugation 1 × 30	=	30 nm
Ring residues 4 × 5	=	20 nm
Exocyclic double bond 2 × 5	=	10 nm
Calc. λ_{max}	=	277 nm

(x) 

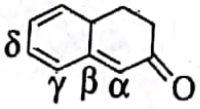
Base value	=	217 nm
(Heteroannular diene)		
Ring residues 3 × 5	=	15 nm
Alkyl substituent 1 × 5	=	5 nm
Exocyclic double bond 1 × 5	=	5 nm
Calc. λ_{max}	=	242 nm

(xi) 

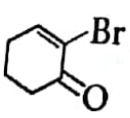
Base value	=	217 nm
(Acyclic diene)		
Ring residues 2 × 5	=	10 nm
Exocycluc double bond 1 × 5	=	5 nm
Calc. λ_{max}	=	232 nm

(xii) 

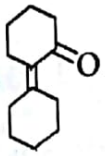
Base value	=	217 nm
(Acyclic diene)		
Ring residues 4 × 5	=	20 nm
Exocyclic double bond 2 × 5	=	10 nm
Calc. λ_{max}	=	247 nm

(xiii) 

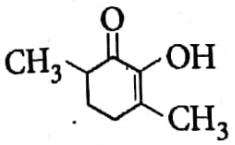
Base value (Enone)	=	215 nm
β substituent 1 × 12	=	12 nm
ω-substituent 1 × 18	=	18 nm
Two double bonds		
Extending conjugation 2 × 30	=	60 nm
Homodiene component 1 × 39	=	39 nm
Exocyclic double bond 1 × 5	=	5 nm
Calc. λ_{max}	=	349 nm

(xiv) 

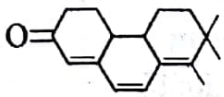
Base value	=	215 nm
(α, β -unsat ketone)	=	25 nm
α-bromo subst. 1 × 25	=	25 nm
β-subst. (ring residue) 1 × 12	=	12 nm
Calc. λ_{max}	=	252 nm

(xv) 

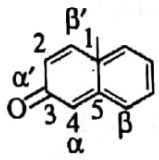
Base value	=	215 nm
(α, β-unsat. ketone)		
α-substituent 1 × 10	=	10 nm
β-substituents 2 ×12	=	24 nm
Exocylic double bond 2 × 5	=	10 nm
(with respect to both the rings)		
Calc. λ_{max}	=	259 nm

(xvi) 

Base value	=	215 nm
OH at α	=	35 nm
β-substituents 2 × 12	=	24 nm
(one alkyl, one ring residue)		
Calc. λ_{max}	=	274 nm

(xvii) 

Base value	=	215 nm
One β-substituent 1 × 12	=	12 nm
β substituents 1 × 18	=	18 nm
ω substituents 2× 18	=	36 nm
Exocyclic double bond 2 × 5	=	10 nm
Two double bonds 2 × 30	=	60 nm
(Extending conjugation)		
Calc. λ_{max}	=	351 nm

(xviii) 

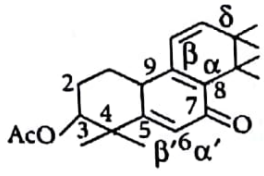
It is a cross-conjugated system

(a)

Base value ($\Delta^{4,5}$ enone)		215 nm
Two β-substituents 2 × 12	=	24 nm
One exocyclic double bonds		
1 ×5	=	5 nm
Calc. λ_{max}	=	244 nm

(b)

Base value ($\Delta^{1,2}$ enone)	=	215 nm
One β′-substituent 1 × 12	=	12 nm
Calc. λ_{max}	=	227 nm
Expected λ_{max}	=	244 nm
(Longest wavelength)		

(xix) 

(a)

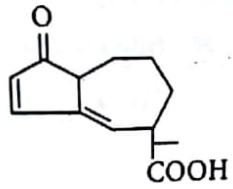
Base value ($\Delta^{8,9}$ enone)	=	215 nm
One α-ring residue	=	10 nm
One β-ring residue	=	12 nm
One double bond extending conjugation 1× 30	=	30 nm

One δ-substituent 1 × 18	=	18 nm
One homoannular diene 1 × 39 (C-ring)	=	39 nm
Calc. λ_{max}	=	324 nm

(b)

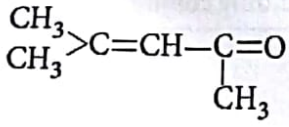
Base ($\Delta^{5,6}$ enone)	=	215 nm
Two β′-substituent 2 × 12	=	24 nm
One exocyclic Double bond 1 × 5	=	5 nm
Calc. λ_{max}	=	244 nm
Expected λ_{max}	=	324 nm

(xx)



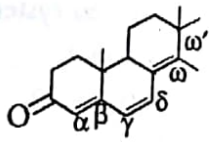
Base value	=	215 nm
One β-substituent 1 × 12	=	12 nm
One γ-substituent 1 × 18	=	18 nm
One δ-substituent 1 × 18	=	18 nm
One exocyclic double bond 1 × 5	=	5 nm
Calc. λ_{max}	=	268 nm

(xxi)



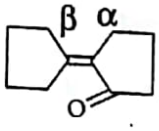
Base value	=	215 nm
Two β-substituents 2 × 12	=	24 nm
Calc. λ_{max}	=	239 nm

(xxii)

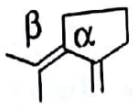


Base value	=	215 nm
One β-substituents 1 × 12	=	12 nm
One ω-substituents 1 × 18	=	18 nm
Two ω′-substituents 2 × 18	=	36 nm
Two double bonds extending conjugation 2 × 30	=	60 nm
Two exocyclic double bonds 2 × 5	=	10 nm
Calc. λ_{max}	=	351 nm

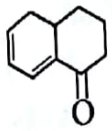
(xxiii)



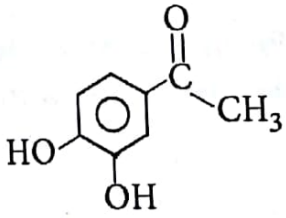
Base value	=	215 nm
one α-ring residue 1 × 10	=	10 nm
two β-ring residues 2 × 12	=	24 nm
two exocyclic double bonds 2 × 5	=	10 nm
Calc. λ_{max}	=	259 nm

(xxiv) 

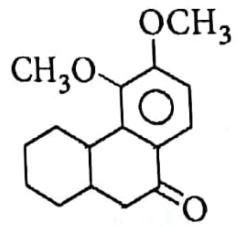
Base value	=	215 nm
One α-substituent (ring residue)		
1 × 10	=	10 nm
Two β-substituents 2 × 12	=	24 nm
One exocyclic double bonds 1 × 5	=	5 nm
Calc. λ_{max}	=	254 nm

(xxv) 

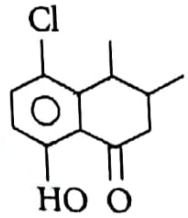
Base value	=	215 nm
One α-substituent 1 × 10	=	10 nm
One δ-substituent 1 × 18	=	18 nm
One double bonds extending conjugation 1 × 30	=	30 nm
One exocyclic double bond 1 × 5	=	5 nm
Calc. λ_{max}	=	278 nm

(xxvi) 

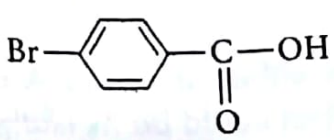
Base value for acyl benzene	=	246 nm
OH at *meta* position	=	7 nm
OH at *para* position	=	25 nm
Calc. λ_{max}	=	278 nm

(xxvii) 

Base value (for acyl benzene)	=	246 nm
OCH_3 at *meta*	=	7 nm
OCH_3 at *para*	=	25 nm
alkyl group at *ortho* (ring)	=	3 nm
Calc. λ_{max}	=	281 nm

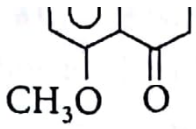
(xxviii) 

Base value	=	246 nm
OH at *ortho*	=	7 nm
Cl at *meta*	=	0 nm
o–ring residues	=	3 nm
Calc. λ_{max}	=	256 nm

(xxix) 

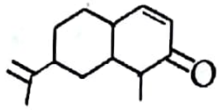
Base value for Ar—C(=O)—OH	=	230 nm
Br at *para* position	=	15 nm
Calc. λ_{max}	=	245 nm

(XXXI)



Base value	=	
o-ring residue	=	3 nm
o-OCH_3	=	7 nm
p-OCH_3	=	25 nm
Calc. λ_{max}	=	281 nm

55. A neutral compound showed λ_{max} rat 251 nm. Predict whether the compound has the following structure. If not, propose an alternative one with similar basic skeleton.

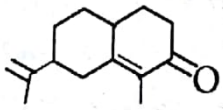


➤ The proposed structure will have λ_{max} as below:

Base value	=	215 nm
One β-substituent 1 × 12	=	12 nm
Calc. λ_{max}	=	227 nm

So the proposed structure is not the actual structure of the compound.

An alternative structure may be as below:

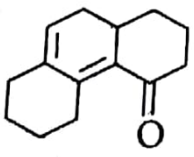


This alternative structure will have λ_{max} as calculated below:

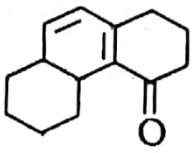
Base value	=	215 nm
One α-substituent 1 × 10	=	10 nm
Two β-substituents 2 × 12	=	24 nm
One exocyclic double bonds 1 × 5	=	5 nm
Calc. λ_{max}	=	254 nm

This value is within 5 nm of the observed value.

56. An unknown compound is beleived to have either structure A or B. Its UV-spectrum shows λ_{max} at 320 nm (Ethanol). What could be its likely structure?



(A)



(B)