1. Polyaromatic compounds are those that consist of at least two benzene rings fused together. Naphthalene is a polyaromatic compound. It has three resonance structures, but one is more stable than the others because both the rings look like benzene.

![Naphthalene resonance forms](image)

Each of the following compounds may be represented by one resonance structure in which all the six-membered rings resemble benzene. Draw this structure for each molecule.

![Resonance structures](image)

2. Which of the following molecules is aromatic according to Huckel’s Rule? Briefly explain your answer.

![Aromatic molecules](image)
3. Which would you consider to be the most stable, cyclononatetraenyl radical, cation, or anion? Explain your answer by drawing the molecular orbital energy diagrams for all three species using the polygon rule.

4. Shown below are structures for Indole and Isoindole. They are structural isomers, yet quite different in stability. Indicate which compound you think is the more stable. Explain your choice.

![Indole and Isoindole structures](image)

5. Phenanthrene is a polyaromatic compound with three fused rings.

![Phenanthrene structure](image)

a) Draw the five resonance structures for phenanthrene.

b) Phenanthrene undergoes electrophilic addition reactions across the bond between C9-C10. How can you account for this behavior?

6. Although [10]-annulene is not aromatic, the compound shown below is. Provide an explanation as to why this happens.

![[10]-annulene structure](image)