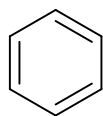
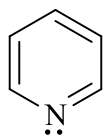


**Marks**  
**6**

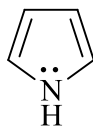
- Benzene, pyridine and pyrrole are all aromatic.



benzene



pyridine



pyrrole



cyclopentadiene

 $pK_a = 15$ 

cyclopentene

 $pK_a = 45$ 

What three criteria must be met for a compound to be aromatic?

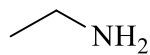
Apply your previous answer to explain the following.

Pyridine is basic but pyrrole is not.

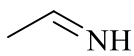
The  $pK_a$  of cyclopentadiene is much lower than that of cyclopentene.

- Consider the amine **D**, imine **E** and nitrile **F** shown below. Draw any lone pairs of electrons that are required to complete the structures.

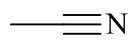
**Mark  
s**  
3



**D**



**E**



**F**

What is the hybridisation at *N* in compound **D**?

What is the hybridisation at *N* in compound **E**?

What is the hybridisation at *N* in compound **F**?

Which of these compounds is the most basic? Why?

**THE REMAINDER OF THIS PAGE IS FOR ROUGH WORKING ONLY.**