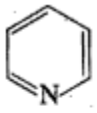
Show whether the following compounds exhibit aromaticity.

(*a*) *Pyridine,* (*b*) *Cyclo-octatetraene,* (*c*) *Pyrrole,*
(*d*) *Cyclobutadiene,* (*e*) *Furan,* (*f*) *Thiophene.*

Solution : (a) Pyridine has the following structure:



It has three double bonds, *i.e.*, 6π electrons.

$$4n+2=6$$
$$4n=6-2=4$$
$$n=1$$

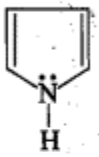
Therefore, pyridine shows aromaticity.

(b) Cyclo-octatetraene has the following structure:

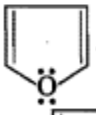
It has four double bonds, *i.e.*, 8π electrons.

$$4n+2=8$$
$$4n=8-2=6$$
$$n=1.5 \text{ (not an integer)}$$

Therefore, cyclo-octatetraene does not show aromaticity.

(c) Pyrrole,  shows aromaticity.

(d) Cyclobutadiene,  is non-aromatic.

(e) Furan,  shows aromaticity.

(f) Thiophene,  shows aromaticity.