Polar molecules (page 15 topic 4)

(a) HBr polar because - polar bond
$\delta^+ \quad \delta^-$
$H — Br$ (net dipole moment) - asymmetrical shape / dipole moment not cancelled out.

(b) N_2 non-polar because non polar bond

(c) ClF_3 polar (net dipole moment), polar bond
not symmetrical shape

(d) CCl_4 non-polar, polar bonds but symmetrical shape (tetrahedral)

(e) CH_3Br polar, polar bonds but not symmetrical (dipole moment - net dipole moment towards bromine)

(f) SO_2 polar, polar bond + not symmetrical shape (bent) (net dipole moment towards 'O')

(g) SF_6 non-polar, polar bonds, symmetrical shape

(h) NH_4^+ non-polar, " , "

(i) NO_2^- same as SO_2 (f) (j) CH_2Cl_2 - same as (e)

(k) $HOCN$ $H-\ddot{O}-C\equiv N:$ polar
(l) BeF_2 non-polar, polar bond, symmetrical shape (linear)
(m) Xe_2F_4 non-polar, " , " (square planar)
(n) CF_2Cl_2 same as (e)
(o) IF_5 polar, polar bonds, not symmetrical (square pyramidal)
(p) AsF_5 non-polar, polar bonds
not symmetrical (trigonal bipyramidal)