91. (3) (1) N_2 : bond order 3, paramagnetic

N_2^- : bond order, 2.5, paramagnetic

(2) c_2 : bond order 2, diamagnetic

c_2^+ : bond order 1.5, paramagnetic

(3) NO: bond order 2.5, paramagnetic

NO^+ : bond order 3, diamagnetic

(4) 0_2 : bond order 2, paramagnetic

0_2^+ : bond order 2.5, paramagnetic

92. (1)

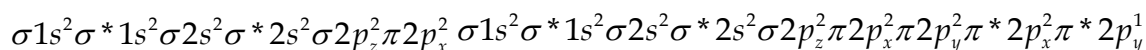93. (3)

94. (3)

95. (3)

96. (3)

97. (1)

98. (4)

99. (3) M.O. electronic configuration of CN^- is $\sigma 1s^2 \sigma * 1s^2\ \sigma 2s^2 \sigma * 2s^2 \pi 2p_x^2 \pi 2p_y^2 \sigma 2p_z^2$
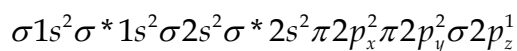
$\therefore B.O. = \dfrac{10-4}{2} = 3$

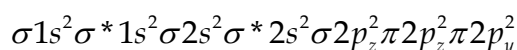M.O. electronic configuration of O_2^- is

$\sigma 1s^2 \sigma * 1s^2 \sigma 2s^2 \sigma * 2s^2 \sigma 2p_z^2 \pi 2p_x^2\ \sigma 1s^2 \sigma * 1s^2 \sigma 2s^2 \sigma * 2s^2 \sigma 2p_z^2 \pi 2p_x^2 \pi 2p_y^2 \pi * 2p_x^2 \pi * 2p_y^1$

$\therefore\ B.O. = \dfrac{10-7}{2} = 1.5$

M.O. electronic configuration of CN^+

$\sigma 1s^2 \sigma * 1s^2 \sigma 2s^2 \sigma * 2s^2 \pi 2p_x^2 \pi 2p_y^2 \sigma 2p_z^1$

$\therefore\ B.O. = \dfrac{9-4}{2} = 2.5$

M.O. electronic configuration of NO^+ is

$\sigma 1s^2 \sigma * 1s^2 \sigma 2s^2 \sigma * 2s^2 \sigma 2p_z^2 \pi 2p_z^2 \pi 2p_y^2$

$\therefore\ B.O. = \dfrac{10-4}{2} = 3$

$\therefore CN^-$ and NO^+ have bond order equal to 3

100. (2) For C_2 (12) :

$(\sigma 1s)^2 (\sigma * 1s)^2 (\sigma 2s)^2 (\sigma * 2s)^2 (\pi 2p_x)^2 (\pi 2p_y)^2$ B.O. $= \dfrac{8-4}{2} = 2$

For N_2(14) :

$(\sigma 1s)^2 (\sigma * 1s)^2 (\sigma 2s)^2 (\sigma * 2s)^2 (\pi 2p_x)^2 (\pi 2p_y)^2 (\sigma 2p_z)^2$ $\therefore$ B.O. $= \dfrac{10-4}{2} = 3$

For B_2 (10)

$= (\sigma 1s)^2 (\sigma * 1s)^2 (\sigma 2s)^2 (\sigma * 2s)^2 (\pi 2p_x)^1 (\pi 2p_y)^1$ $\therefore$ B.O. $= \dfrac{6-4}{2} = 1$

For O_2 (16)

$$= (\sigma 1s)^2 \, (\sigma *1s)^2 (\sigma 2s)^2 (\sigma *2s)^2 (\sigma 2p_z)^2 (\pi 2p_x)^2 \, (\pi 2p_y)^2 (\pi *2p_x)^1 (\pi *2p_y)^1$$

$$\therefore \text{ B.O.} = \frac{10-6}{2} = 2$$

F_2 is (18)

$$= (\sigma 1s)^2 \, (\sigma *1s)^2 (\sigma 2s)^2 (\sigma *2s)^2 (\sigma 2p_z)^2 (\pi 2p_x)^2 \, (\pi 2p_y)^2 (\pi *2p_x)^2 (\pi *2p_y)^2$$

$$\therefore \text{ B.O.} = \frac{10-8}{2} = 1$$

$\therefore N_2$ has the highest bond order = 3.