

Answers**Part I:** Multiple Choice Questions

1. D
2. A
3. C
4. B
5. C
6. E

7. D
8. D
9. E
10. A
11. E

12. C
13. D
14. E
15. A
16. A

17. B
18. D
19. C
20. B
21. A
22. D

23. D
24. D
25. D

Part II: Short Answer / Calculation.

1. Lewis structures:
 - a. ICl_3 : trigonal bipyramid EPG, T-shape MG, dsp^3 , polar
 - b. TeBr_2 : tetrahedral EPG, bent MG, sp^3 , polar
 - c. XeF_4 : octahedral EPG, square planar MG, d^2sp^3 , nonpolar
 - d. BrF_2^- : trigonal bipyramid EPG, linear MG, dsp^3 , nonpolar
 - e. I_3^- : trigonal bipyramid EPG, linear MG, dsp^3 , nonpolar

2. Molecular orbitals:

N_2 : [core electrons] $(\sigma_{2s})^2 (\sigma_{2s}^*)^2 (\pi_{2p})^4 (\sigma_{2p})^2$ bond order = 3, diamagnetic, shortest bond length

N_2^{+1} : [core electrons] $(\sigma_{2s})^2 (\sigma_{2s}^*)^2 (\pi_{2p})^4 (\sigma_{2p})^1$ bond order = 2.5, paramagnetic

N_2^{-1} : [core electrons] $(\sigma_{2s})^2 (\sigma_{2s}^*)^2 (\pi_{2p})^4 (\sigma_{2p})^2 (\pi_{2p}^*)^1$ bond order = 2.5, paramagnetic

3. names:
 - a. ethane
 - b. ethene
 - c. ethyne or acetylene
 - d. ethanol
 - e. methoxy methane or dimethyl ether
 - f. propanone or acetone
 - g. ethanal
 - h. benzene
 - i. methanol
 - j. ammonia