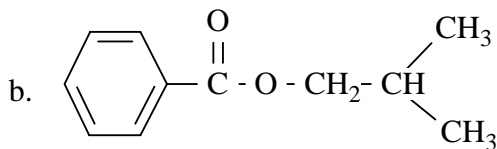
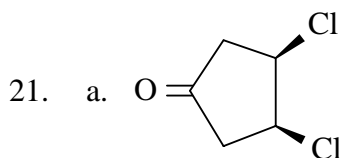
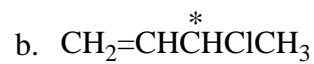
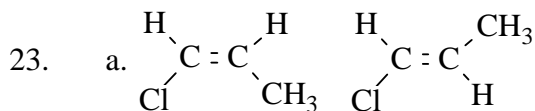
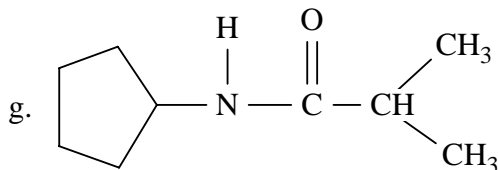
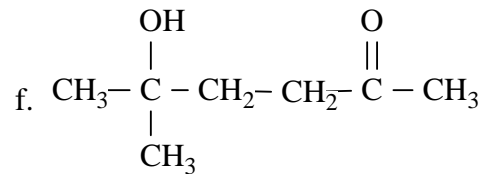
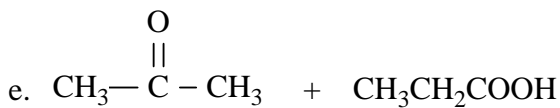
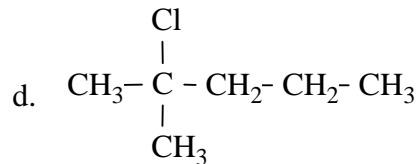
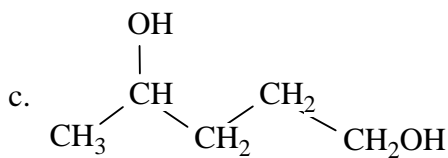
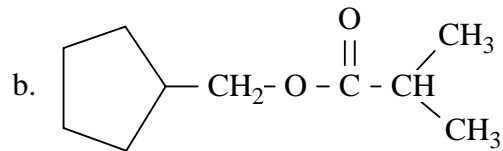
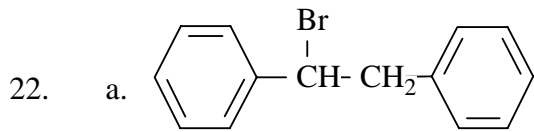
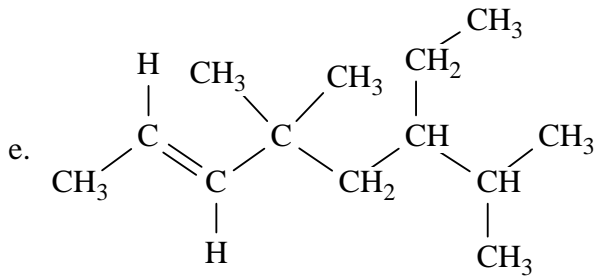
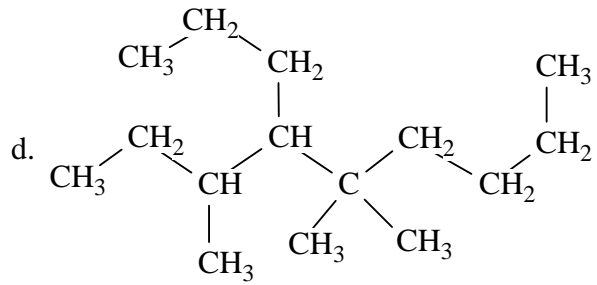
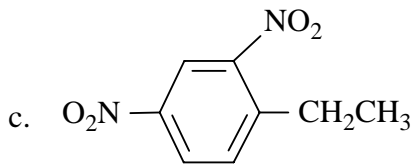
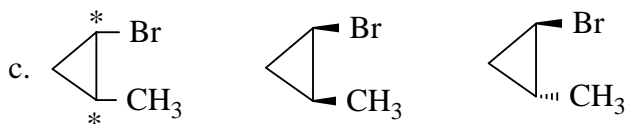


CHEM 1110**Sample Final Exam 1 ANSWERS**

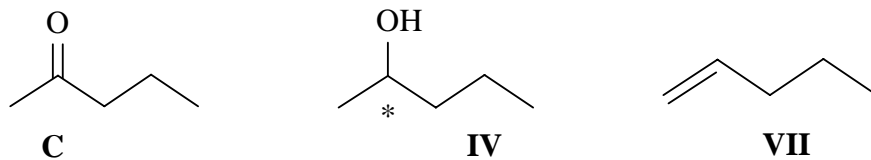
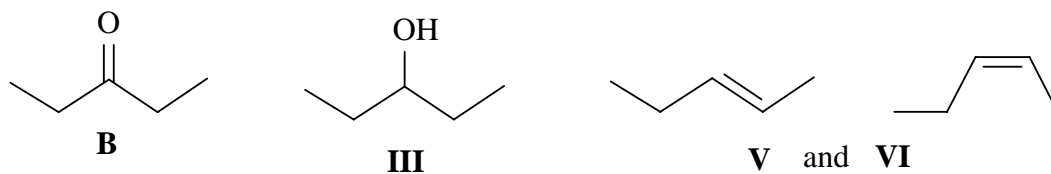
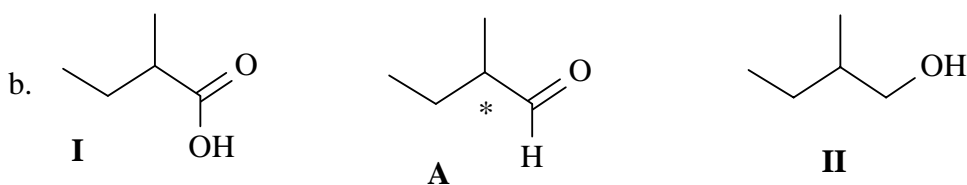
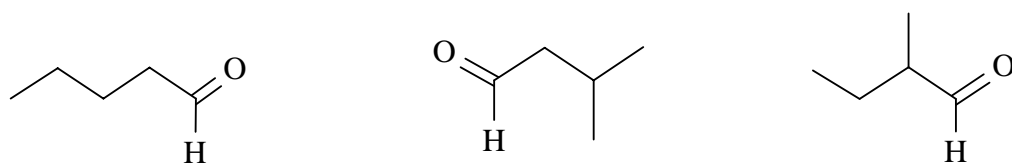
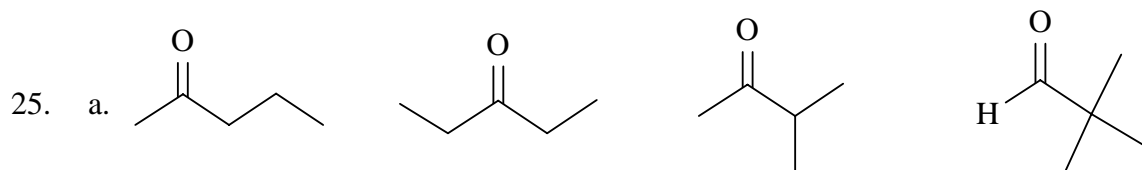
- Molar mass = 133 g/mol
(If you obtain an answer less than this, it probably means you forgot to subtract out the vapor pressure of the water from the total pressure of the gases.)
- Molar mass of gas X = 131 g/mol
(The molar mass of gas X must be greater than the molar mass of argon because gas X effuses at a rate of 1.66 mL/minute while argon effuses at a rate of 3.00 mL/minute.)
- (a) M_2S_3 (b) The metal is aluminum.
- (a) Oxygen is the limiting reagent because 7.5 L of O_2 are needed to react with 6.00 L of NH_3 and we only have 7.00 L of O_2 available.
(b) The mole fraction of $NH_3 = 0.0667$
(c) The partial pressure of ammonia = 0.0267 atm
- (a) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 4f^{14} 5d^{10}$
(b) none
(c) Diamagnetic
(d) (i) 18 (ii) 6 (iii) 16 (iv) 4
- E
- A
- C
- A
- C
- D
- A
- E
- D
- B
- B
- E
- B
- E
- (a) 3-chlorophenol or m-chlorophenol
(b) 6-bromo-4-ethylheptanal
(c) 2,2-dimethyl-3-hexyne
(d) butanoic acid
(e) 2-phenyl-2-propanol







24. (a) 5.84×10^{-5} cm
 (b) 3.83×10^{-8} m and 7.84×10^{15} sec⁻¹



26. (a) ethanal (Dipole-Dipole and London forces)
 (b) fluoromethane (Dipole-Dipole and London forces)
 (c) cyclohexanol (Hydrogen bonding, Dipole-Dipole and London forces)
 (d) trimethylamine (Dipole-Dipole and London forces)
27. a. Si (118 pm), Ca (197 pm), O (74 pm)
 b. K⁺ (133 pm), Ca²⁺ (99 pm), Cl (181 pm)
 c. Ga(1.8), Tl (1.6) S (2.2)
 d. O⁺ (3388 kJ/mol), Ne (2081 kJ/mol), Ca⁺ (1145 kJ/mol)

e. Sn (-121 kJ/mol), Se (-195 kJ/mol), Br (-325 kJ/mol)

f. Sr (550 kJ/mol), Ne (2080 kJ/mol), P (1012 kJ/mol)

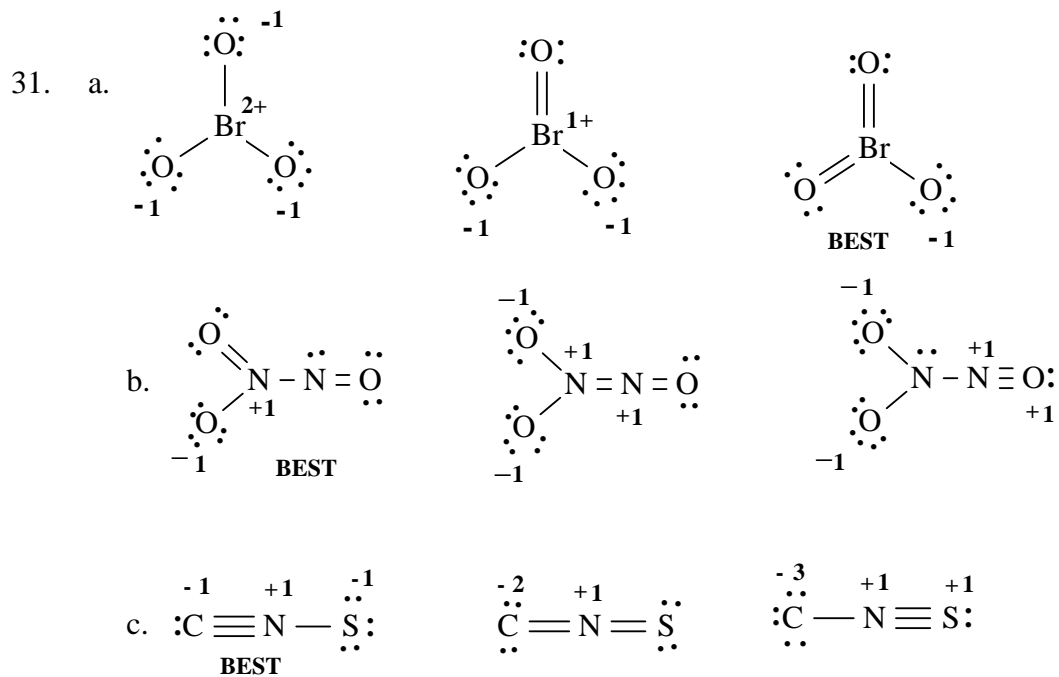
g. NF_3 (0.25 D), NH_3 (1.47 D), SF_6 (0 D)

h. C-F (135 pm), H-F (92 pm), N-Cl (175 pm)

28. D

29. A

30. $\text{mmol OH}^-/\text{mmol Sc} = 11.75/4.00 = 2.94$ and therefore it is $\text{Sc}(\text{OH})_3$



32. (1) sp^2 (2) sp^2 (3) sp^2 (4) sp^3 (5) sp^3 (6) sp