Answers to 2007 FInal.

1 A 2 B 3 B 4 B 5 B 6 A 7 A 8 A 9 C 10 A 11 B 12 B 13 C 14 C 15 A

16 D 17 C 18 A 19 A 20 C 21 A 22 B 23 B 24 B 25 B 26 C 27 A 28 B

29 D 30 A 31 B 32 D 33 C 34 B 35 B 36 C

37 F 38 H 39 D 40 C 41 A 42 B 43 A 44 A 45 B 46 E

47 F 48 G 49 H 50 D

I. There should be one double and two single N–O bonds - there IS resonance.
    The double bond could be shared among three equivalent positions.   The form
charge on the nitrogen is +1. The single bonded oxygens are each -1, and the double bonded
oxygen has a formal charge of 0. The geometry is trigonal planar.

II. In the HClO structure, The Cl is +1 and the O is -1, while in HOCl, there are no formal
charges. The second one is therefore favored

III. 7.34 L of hydrogen   B. 75 mL or 0.075 liter

IV. $C_2H_5OH(\ell)$ + 3 $O_{2(g)}$ →   2 $CO_2(g)$ + 3 $H_2O(\ell)$
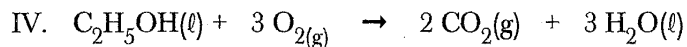
     .500 mol ethanol, and 2.03 mol of O_2.

     C. The ethanol is limiting. The reaction produces one mole of CO_2. P = 2.46 atm

     D. 683.2 kJ. (based on the half mol of ethanol)

V. 3.2 m , – 5.95°   0.946 , 0.946 atm