CHEM 2321 Exam 3 Name:

November 21, 2023 UTEP ID #:

If required, the Exam 3 retake homework will be due Friday, November 24, before 5 pm through <http://organic.utep.edu/quiz>, no exceptions or excuses. Put your name on these sheets so that you can recover your class answers. Expect an email from me.

***Not all charges, intermediates, or reagents are shown.***

1.-5. Match each compound in the following synthesis to its best functional group name. Answers may be repeated.



1. Compound A a. aldehyde
2. Compound B b. amide
3. Compound C c. hemiaminal
4. Compound D d. oxime
5. Compound E e. not a.-d.

6.-10. Match each compound in the following synthesis to its best functional group name. Answers may be repeated.



1. Compound F ­ a. amine
2. Compound G b. enamine
3. Compound H c. imine
4. Compound I d. iminium
5. Compound J e. not a.-d.

11.-15. Order the charged intermediates in the acid catalyzed reaction of methanal with excess methanol.

1. First intermediate
2. Second intermediate
3. Third intermediate
4. Fourth intermediate
5. Fifth intermediate

a.  b.  c.  d.  e. 

16.-19. Completing the charges in the following compounds, then match each to a type of compound.

1.  a. salt
2.  b. ylide
3.  c. zwitterion
4.  d. not a.-c.
5. What is the major product of the following reaction sequence?



a. (*E*)-2-methylpent-2-ene b. (*Z*)-2-methylpent-2-ene

c. (*E*)-3-methylpent-2-ene d. (*Z*)-3-methylpent-2-ene e. not a.-d.

21.-25. Match each reaction sequence to a product. Answers may be repeated.

1.  a. butanoyl chloride
2.  b. butanoic anhydride
3.  c. butanenitrile
4.  d. butanamide
5.  e. not a.-d.

26.-30. Match each reaction sequence to a product below. Each step is separated by commas. Do the steps in parentheses first. Assume any necessary workup between steps. Answers may be repeated.

1. ethanal + NaBH4, /acid catalysis, 2 (iodomethane + Mg)
2. +thionyl chloride/pyridine/heat, (2 (iodomethane + 2 Li) + CuI), (bromoethane + Mg)
3. + ammonia/heat, , (bromoethane + Mg)
4. +ethanol/acid catalysis, NH3, thionyl chloride/heat, (1-chloropropane + Mg), LiAlH4
5. + NaOH, (bromoethane + 2 Li), NaBH4

a.  b.  c.  d.  e. not a.-d.

Goggles, goggles, goggles, it’s always Thanksgiving. Have a safe Holiday!