

Exam 3

Part A

Name _____

Follow the directions and select the BEST answer for each section. Mark your answers on the scantron answer sheet carefully. Make sure you put your name on your scantron answer sheet- do so before you begin! Circle your name for 2 points extra credit. Clearly indicate which Scantron form is the **PRIMARY** and **SECONDARY** ones by writing **PRIMARY** and **SECONDARY** on the top-right hand corner of each Scantron.

There are 19 questions/problems for 100 pts. total.

A. Match or fill in the blank. Remember to choose the "BEST" answer!

2 pts. each

1. A catalyst _____ the activation energy of a chemical reaction.
 - A. increases
 - B. decreases
 - C. changes
 - D. removes
 - E. installs
2. A catalyst _____ the rate of a chemical reaction.
 - A. increases
 - B. decreases
 - C. changes
 - D. removes
 - E. installs
3. Hand warmers take advantage of an exothermic chemical reaction. Which concept applies when one is used?
 - A. Le Chatelier's principle of equilibrium maintenance
 - B. equilibrium
 - C. conservation of energy
 - D. conservation of mass
 - E. all of these
4. Which functional group must be present in the monomer for polymerization to occur?
 - A. aldehydes
 - B. alkanes
 - C. alkenes
 - D. amines
 - E. esters
5. How many isomers of pentane are there?
 - A. 1
 - B. 2
 - C. 3
 - D. 4
 - E. 5

6. Why are trans double bonds unfavorable in edible fats?
- they taste bad
 - they taste good
 - they allow the fat molecules to “cake” and form a solid
 - they force the molecules to spread apart and form a liquid
 - they are better for your health
7. Which is the generic name for a molecule containing repeating single units?
- Peptideamino acid
 - carbohydrate
 - polymer
 - monomer
8. What kind of bond exists in all peptides?
- peptide/amide
 - amine/amide
 - sulfide/thiol
 - hydrogen
 - covalent
9. Which is not an example of a natural polymer?
- hair
 - wood
 - nylon
 - rubber
 - DNA

Part B

Solve the following problems. Be sure to show all of your work if you want any credit- i.e.

NO WORK = NO CREDIT!

10. Fill in the missing information in the following table.

/10 pts.

line structure	# of carbons	name
□		
—		
□		
□		
□		
□		
□		
□		
□		
□		

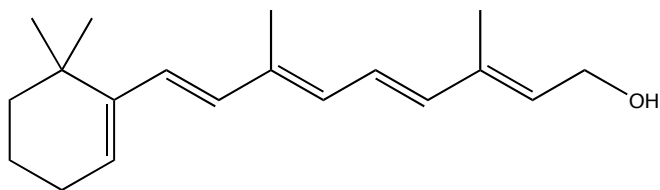
11. Draw the energy diagram for an exothermic reaction. Label all basic parts listed below. 4 pts.



reactant energy
product energy
activation energy

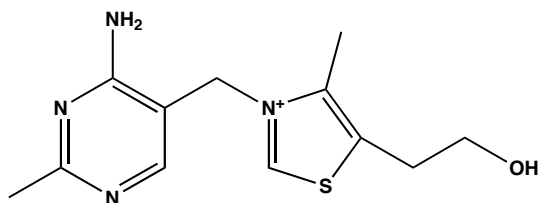
12. Identify **all heteroatomic** functional groups only in the following molecules. Make sure you clearly label every one and account for all of them!

A. vitamin A (retinol) /1



a. _____

B. vitamin B1 (thiamine) /4



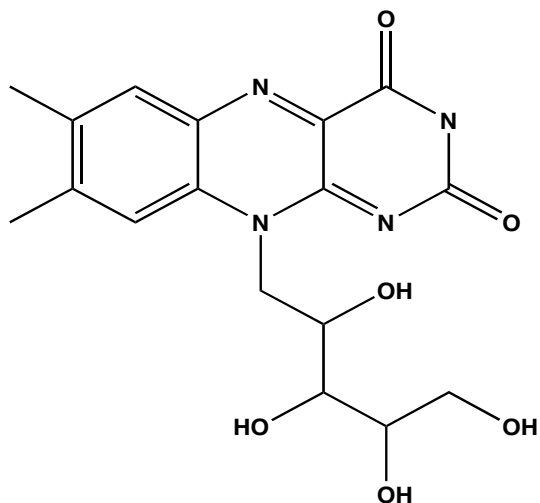
a. _____

b. _____

c. _____

d. _____

C. vitamin B2 (riboflavin) /4



a. _____

b. _____

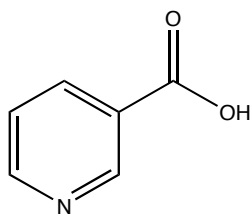
c. _____

d. _____

/13 pts. total

D. vitamin B3 (niacin)

/2

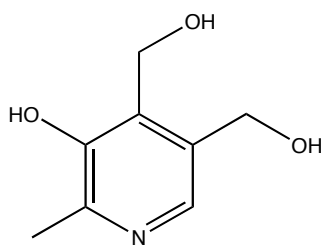


a. _____

b. _____

E. vitamin B6 (pyridoxine)

/2

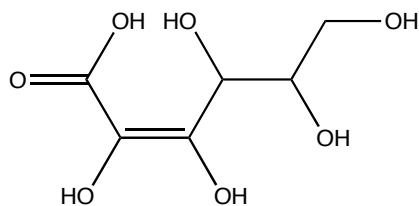


a. _____

b. _____

F. vitamin C (ascorbic acid)

/2

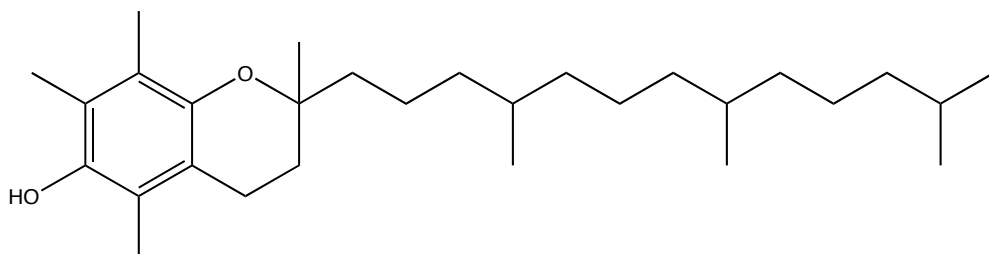


a. _____

b. _____

G. vitamin E (α -tocopherol)

/2

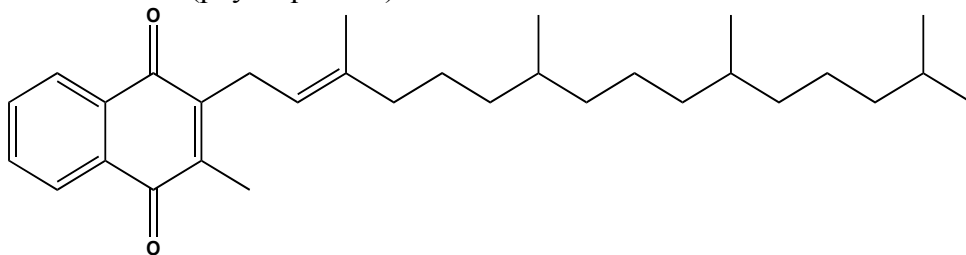


a. _____

b. _____

H. vitamin K (phylloquinone)

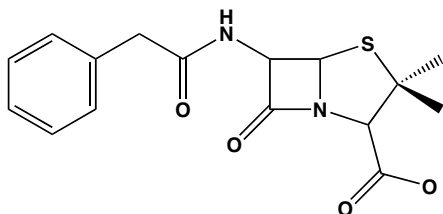
/1



a. _____

I. Penicillin G

/3



a. _____

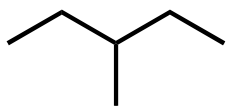
b. _____

c. _____

/12 pts. total

13. Name the following compounds

A.



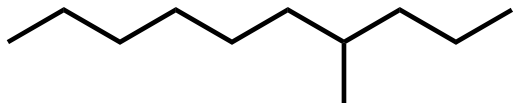
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B.



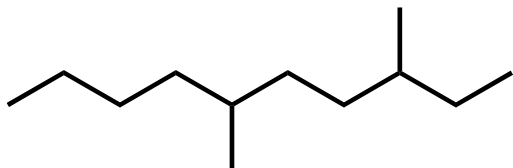
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C.



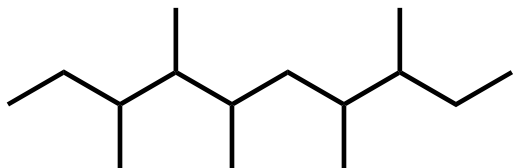
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D.



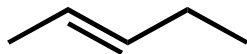
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E.



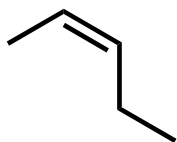
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F.



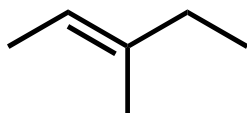
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G.



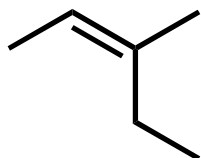
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H.



/2

I.



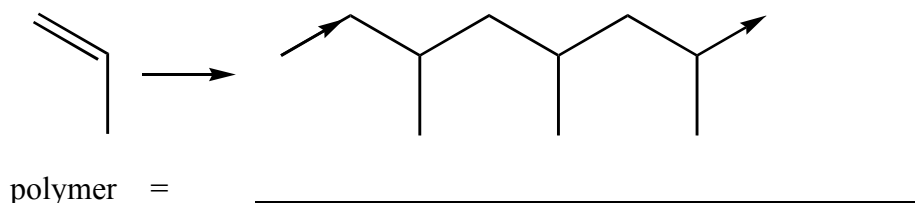
/2

/18 pts. Total

14. Draw a cartoon figure of a monomer. Then draw a figure of the polymer that forms from this monomer. /2

15. Draw a cartoon representation of a nucleotide (a monomeric unit of DNA). /3

16. Identify (*i.e.* circle) the monomeric unit (propylene) in the polymer and name the polymer. /3



17. Draw the fundamental structural unit for all amino acids. /4

18. Draw an example of a dipeptide with an amide bond that joins two amino acids with R-groups R_1 and R_2 , respectively /4

19. Match (draw a line between) the names and their respective structural information contained in the four structural units of proteins. /4

- | | |
|--|--|
| a) Primary (1°) structure | helix or sheet structure |
| b) Secondary (2°) structure | amino acid sequence |
| c) Tertiary (3°) structure | protein folding due to intermolecular interactions |
| d) Quarternary (4°) structure | protein folding due to intramolecular interactions |

/20 pts. Total

/10 pts pg 2

/13 pts pg 3

/12 pts pg 4

/18 pts pg 5

/20 pts pg 6

/73 pts Total