CHEM1108 Example Multiple Choice Questions

The following multiple choice questions are provided to *illustrate* the type of questions used in this section of the paper and to provide you with extra practice.

It is *not* a sample quiz. The questions in the paper will be in the style of these questions but may well cover different topics.

In the exam, the answer should be indicated by clearly circling the letter next to the choice you make **and** by filling in the corresponding box on the computer-marked sheet provided. The marks for each correct answer are given beside each question.

Instructions for use of the computer sheet. Draw a **thick** line through the **centre** and crossing both edges of each box selected, as in this example.

Use a **dark** lead pencil so that you can use an eraser if you make an error. Errors made in ink cannot be corrected – you will need to ask the examination supervisor for another sheet. Boxes with faint or incomplete lines or not completed in the prescribed manner may not be read. Be sure to complete the SID and name sections of the sheet.

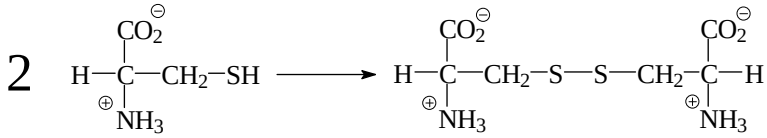
Your answer as recorded on the sheet will be used in the event of any ambiguity.

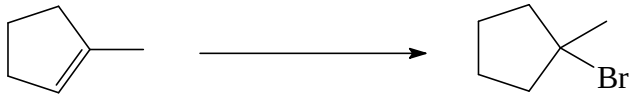
There is only one correct choice for each question.

Negative marks will not be awarded for any question.

		Marks
1.	Which one of the following molecules has a dipole moment? **A** CS_2 **B** $CHCl_3$ **C** SF_6 **D** CCl_4 **E** O_2	**1**
2.	Which one of the following elements exhibits semi-metallic (metalloid) behaviour? **A** Ar **B** Na **C** Ge **D** F **E** Xe	**1**
3.	What is the spatial arrangement of the *valence shell electron pairs* (σ and non-bonding) in the CH_3^- ion? **A** trigonal planar **B** tetrahedral **C** trigonal pyramidal **D** bent **E** square planar	**1**
4.	What is the molecular geometry/shape of ammonia? **A** tetrahedral **B** trigonal pyramidal **C** square planar **D** octahedral **E** linear	**1**
5.	Which of the following elements has the lowest electronegativity? **A** F **B** N **C** Br **D** Cs **E** Al	**1**

		Marks
6.	Which of the following elements has the highest first ionisation energy? **A** Li **B** Na **C** K **D** C **E** Ne	**1**
7.	Which of the following elements has the smallest atomic radius? **A** I **B** B **C** O **D** Al **E** C	**1**
8.	Which one of the following sets of quantum numbers is valid? **A** n = 4, l = 3, m_l = 4, m_s = –½ **B** n = 3, l = 1, m_l = 0, m_s = +½ **C** n = 1, l = –1, m_l = 1, m_s = +½ **D** n = 2, l = 1, m_l = 2, m_s = –½ **E** n = 2, l = 3, m_l = –3, m_s = +½	**1**
9.	Rank the following series of atoms in order of INCREASING electronegativity. N O F P As **A** N < O < F < P < As **B** F < O < N < P < As **C** As < P < N < O < F **D** As < P < N < F < O **E** F < N < O < As < P	**1**
10.	What is the correct atomic symbol for an atom with 15 protons and 17 neutrons? **A** $^{17}_{15}Cl$ **B** $^{17}_{15}P$ **C** $^{32}_{15}P$ **D** $^{15}_{17}Cl$ **E** $^{32}_{17}Cl$	**1**

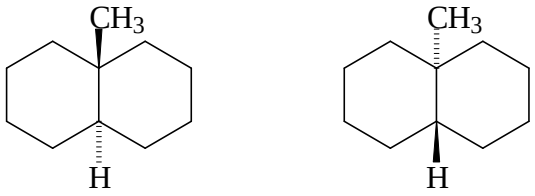
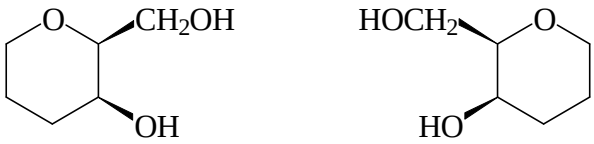
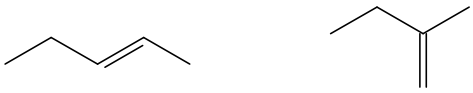
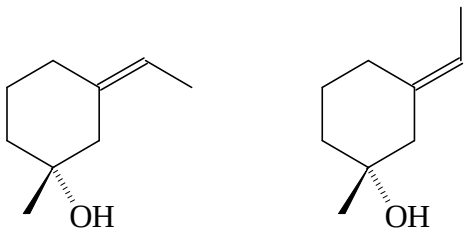
	Marks
11. Which one of the following ions is used in the treatment of bipolar disorder? **A** Cu^{+} **B** Be^{2+} **C** Fe^{2+} **D** Zn^{2+} **E** Li^{+}	**1**
12. The pK_a of HCN is 9.21. What is the K_b of its conjugate base, CN^{-}? **A** 9.21 **B** $10^{-9.21}$ **C** 7 **D** 4.79 **E** $10^{-4.79}$	**1**
For questions 13 - 19, choose from **A - E** the term that best describes the overall mechanism of the reaction. **A.** Electrophilic addition **B.** Oxidation **C.** Elimination **D.** Nucleophilic substitution **E.** Nucleophilic addition	
13.  **A B C D E**	**1**
14.  **A B C D E**	**1**
15.  **A B C D E**	**1**
16.  **A B C D E**	**1**
17.  **A B C D E**	**1**

		Marks
18. 	**A B C D E**	**1**
19. 	**A B C D E**	**1**

For questions 20 - 24, choose from **A - E** the term that best describes the isomeric relationship for each of the following pairs of compounds.

A. Enantiomers **B.** Same compound **C.** Constitutional isomers

D. Diastereoisomers **E.** Conformational isomers

20. 	**A B C D E**	**1**
21. 	**A B C D E**	**1**
22. 	**A B C D E**	**1**
23.  **(P)**	**A B C D E**	**1**
24.  **(Q)**	**A B C D E**	**1**

25. How many stereoisomers are there for the compound labelled (**P**) in question 23? **1**

A 1 **B** 2 **C** 3 **D** 4 **E** 8

26. Give the stereochemical description of the compound labelled (**Q**) in question 24. **Marks 1**

A a (*Z*)-isomer

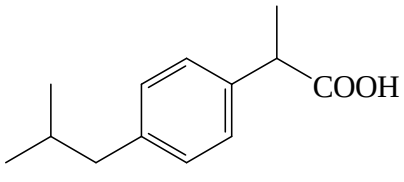
B an (*R*)-enantiomer

C an achiral compound

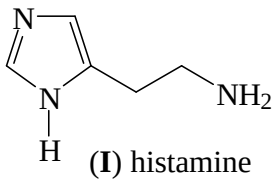
D an *(S*)-enantiomer

E an (*E*)-isomer

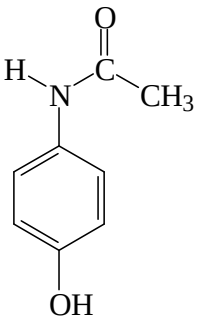
In answering the questions 27 - 31 consider the six compounds (**H**) - (**M**).



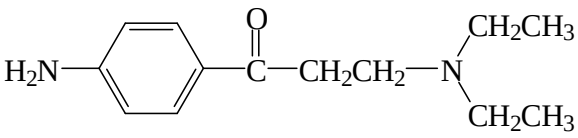
(**H**) ibuprofen



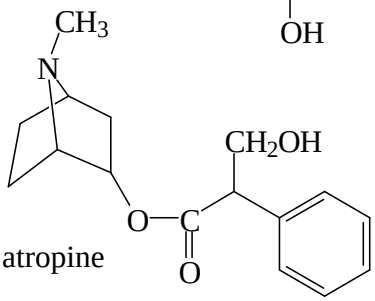
(**I**) histamine



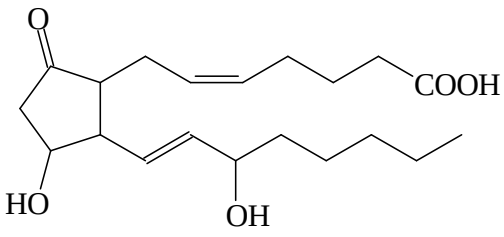
(**J**) paracetamol



(**K**) procaine



(**L**) atropine



(**M**) prostaglandin

27. Which compounds, if any, will show effervescence (bubbling) when added to sodium hydrogencarbonate solution? **2**

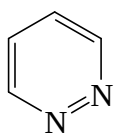
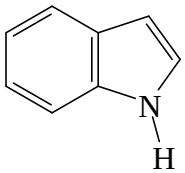
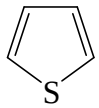
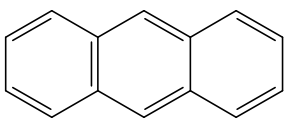
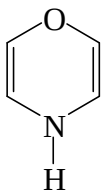
A **I**, **K** and **L** only

B **H** and **M** only

C **J** only

D **L** and **M** only

E None of them

	Marks
28. Which compounds, if any, will react with cold dilute NaOH? **A** **L** and **M** only **B** **K** only **C** **I**, **K** and **L** only **D** **H**, **J** and **M** only **E** None of them	**1**
29. Which compounds, if any, will dissolve in cold dilute HCl? **A** **L** and **M** only **B** **I**, **K** and **L** only **C** **I**, **J** and **K** only **D** **H** and **M** only **E** None of them	**1**
30. Which compounds will undergo an addition reaction with Br_2/CCl_4? **A** **H** and **M** only **B** **M** only **C** **I** only **D** **L** and **M** only **E** **K** and **M** only	**1**
31. Which compounds will undergo a reduction reaction with $NaBH_4$? **A** **J** only **B** **K** only **C** **H** and **M** only **D** **L** and **M** only **E** **K** and **M** only	**1**
32. Which one of the following compounds is **not** aromatic?  **A**  **B**  **C**  **D**  **E**	**1**

Answers

Question	1	2	3	4	5	6	7	8	9	10
Answer	B	C	B	B	D	E	C	B	C	C

Question	11	12	13	14	15	16	17	18	19	20
Answer	E	E	C	E	B	D	D	A	B	B

Question	21	22	23	24	25	26	27	28	29	30
Answer	A	C	D	B	D	B	B	D	B	B

Question	31	32
Answer	E	E