GX 2380

OLLSCOIL NA hÉIREANN, GAILLIMH

NATIONAL UNIVERSITY OF IRELAND, GALWAY

WINTER EXAMINATIONS 1999

FIRST YEAR DIPLOMA IN NURSING EXAMINATIONS

BIOLOGICAL SCIENCES (BL188)

CHEMISTRY/PHYSICS (CP101)

(TOTAL MARKS 100)

Professor D.L.H. Williams
Professor R.N. Butler
Professor W.J. Spillane
Dr. Simon Breeden

Time allowed: 1 Hour

Use a separate answer book for each section i.e. Chemistry/Physics

CHEMISTRY
(50 Marks)

Please answer *ten* of the following questions. Each question carries equal marks.

Please answer *ten* of the following questions. Each question carries equal marks. Use a separate answer book for each section i.e. Chemistry and Physics.

1. Define (a) Atomic Weight (b) Molecular Weight and (c) Isotope.

2. Write out the electronic configuration of (a) Carbon and (b) Oxygen.

3. Give an example of (a) Ionic Bonding and (b) Covalent Bonding.

4. Complete and balance the following equations:

$$HCl + Ca(OH)_2 \longrightarrow$$
$$HNO_3 + LiOH \longrightarrow$$

5. What are the Bulk Elements necessary for life? **And** give two examples of the macrominerals necessary for life.

contd./

6. Give, with definitions of all the terms involved, the equation of state for an ideal gas.

7. Calculate the number of moles present in 21g of Sodium Fluoride.

8. Calculate the pH of (a) 0.005 M HCl and (b) 0.01 M NaOH.
[Hint: in (b) calculate the pOH first]

9. What is a buffer system used for? **And** give an example of a buffer system.

10. What is the order with respect to (a) nitrogen monoxide (NO) (b) oxygen and (c) overall for the reaction:

$$2NO + O_2 \longrightarrow 2NO_2$$

Whose rate is given by: Rate = $k[NO]^2[O_2]$

11. Write the basic structure of an amino acid. What are the structures of Glycine and Alanine?

12. What are the general structures of (a) an alcohol (b) an amide (c) an ether and (d) a ketone?
[Example: A Primary amine would be R-NH_2]

contd./

PHYSICS

Dr. W. van der Putten/Mr. B. Tuohy.

Please answer the following questions. Each question carries equal marks.

1. What are the three states of matter? List the principal properties of each state.

2. What is the S.I. unit for the following:-

   Length
   Time
   Mass
   Temperature
   Force
   Pressure

3. What is the difference between a Vector and a Scalar? Give examples of each.

4. State Newton's 1st and 2nd laws.

5. What is the weight of an average 70kg man ($g=9.81\ m/s^2$)?

6. A patient's temperature was noted at the following:-

   0.900 a.m.: 37C, 12:00 a.m.: 38C, 15:00 : 40C, 20:00 : 38C 24.00: 37C

   Plot this data in a suitable graph for display.

7. Explain the difference between a conductor and an isolator in the context of the flow of electrical current. Give an example of each.

8. Explain what is meant by a d.c. and an a.c. electrical supply.

9. Define what is meant by the ideal gas law. State Boyle's Law.

10. Explain the difference between "Macroshock" and "Microshock".