



UNIVERSITY OF EDUCATION, WINNEBA
INSTITUTE FOR TEACHER EDUCATION AND CONTINUING
PROFESSIONAL DEVELOPMENT (ITECPD)



END OF FIRST SEMESTER EXAMINATIONS, APRIL, 2024

LEVEL 200

COURSE CODE: JBI232

COURSE TITLE: PARTICULATE NATURE OF CHEMISTRY

TIME ALLOWED: 2 HRS

028

INDEX NUMBER:

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GENERAL INSTRUCTIONS:

- This paper is made up of **ONE SECTION**.
- *The Section is made up of five essay type questions.*
- *Answer any THREE questions in your answer booklet.*
- *Each question carries equal marks. You are expected to start each question on a new page.*
- *You are expected to hand over your answer booklet to the invigilator before you leave the examination hall.*

Instruction: Answer any three (3) questions in the answer booklet provided.

1. (a) Use the information provided in the table below to answer the questions that follow.

Element (atom)	Atomic number	Mass number
A	8	16
B	17	37
C	15	31
D	8	18
E	11	23

- (i) Which of the atoms are isotopes of the same element?
- (ii) Which type of bond exists between E and B in the compound EB?
- (iii) Write the formula of the compound formed when E combines with D?
- (iv) What type of bond exists between atoms of A and its diatomic molecule?

(8 marks)

(b) What is the meaning of the following?

i. Tyndall effect

(1 mark)

ii. Foam

(1 mark)

(c) Given that Avogadro constant is 6.02×10^{23} , determine the number of atoms in 0.001 mol of a substance.

(3 marks)

(d) i. Identify two reasons why separation of mixtures necessary?

(2 marks)

ii. Explain how you would separate a mixture of sodium chloride and sand (5 marks)

2(a) Calculate the mole fraction of 12g of O_2 mixed with 14g of CO_2 and 6g of N_2 at room temperature.

(6 marks)

(O=16, C=12, N= 14)

(b) i. Explain how ions are formed from atoms.

(4 marks)

ii. Describe the formation of covalent bonding using a water molecule.

(4 marks)

(c) Copy and complete the table

Example of colloids	Dispersing Medium	Dispersed Phase	Colloid Type
Fog,			
Milk			

6 marks

3. (a) The total number of electrons and protons in a neutral atom is 28. The mass number is 32. What is the number of neutrons?

(5 marks)

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- (b) i. Explain the trend of electronegativity across a period. (3marks)
 ii. Mention two factors favouring covalent bond formation. (2 marks)
 iii. Describe the meaning of covalent bonding. (2marks)
- (c) Name 2 types of reactions that would have H₂O (l) as a product (2 marks)
- (d) Give reasons for the following
- i. ionic compounds have high melting and boiling points (3 marks)
 ii ionic compounds are crystalline, brittle and hard solids at room temperature (3 marks)

4. (a) 100g of Na₂CO₃ are dissolved in water and the solution made up to 500 cm³.
 Find the concentration in moles per dm³ of the solution. (5 marks)

(Na=23, C= 12, O=16)

- (b) Balance each of the following reactions and identify each type of reaction:
- (i) NaBr + Ca(OH)₂ → CaBr₂ + NaOH (3 marks)
 (ii) NH₃ + H₂SO₄ → (NH₄)₂SO₄ (3 marks)
 (iii) CH₄ + O₂ → CO₂ + H₂O (3 marks)
- (c) Explain the procedure for separating a mixture of oil and water (6 marks)

5(a) Explain the reasons for the following

- i. Why covalent compounds are often found in gaseous or liquid states at room temperature? (4marks)
 ii. Why most covalent compounds do not conduct electricity? (4 marks)

(b) Write **four (4)** Properties of Group VII elements. (4 marks)

- (c) i. Distinguish between unsaturated solution and saturated solution. (4 marks)
 ii. How does increase in temperature affect solubility of gases in liquids? (4 marks)

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