

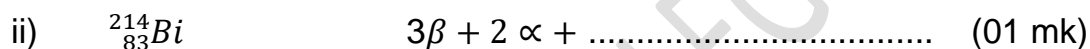
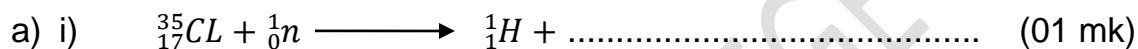
ST. STEPHEN'S COLLEGE BBAJJA

S.5 CHEMISTRY PAPER ONE



INSTRUCTIONS: Answer all questions.

1. Complete the following equations for the nuclear reactions



b) When a radioactive isotope was stored for 42 days it retained $\frac{1}{8}$ of its original activity. Calculate the half life of the isotope. (02 mks)

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2. An element Y has three naturally occurring isotopes with isotopic masses and relative abundances as shown below.

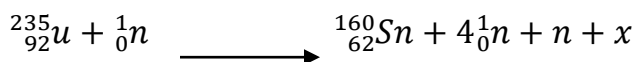
Isotopic mass	Relative abundance%
23.98	78.60
24.98	10.11
25.98	11.29

(a) Calculate the average atomic mass of Y. (02 marks)

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(b) Identify element X in the following equation for nuclear reaction. (01 mk)



X is

3. a) When 8.8g of a hydrocarbon Z was burnt in excess air, 14.4g of water and 13.4dm³ of carbondioxide gas were obtained at stp. Determine the empirical formula of Z. (3 ½ mks)

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b) The vapour density of Z is 22. Write the name and molecular formula of Z (01 mk)

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4. a) Name a reagent that can be used to distinguish between the following pair of ions. In each case state what would be observed if each ion is treated with the reagent.

i) Cu^{2+} and Fe^{2+} .

Reagent

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ii) Observation

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iii) NO_2^- and NO_3^- (03 mks)

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Observation

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b) Write a redox equation of reaction of potassium manganate (vii) in neutral/alkaline medium and state the respective observation. (2 ½ mks)

Equation:

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Observation:

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5. a) Iron (ii) sulphate is normally used to standardise a solution of potassium manganate (vii) acidified using sulphuric acid.

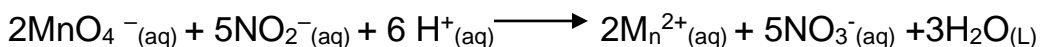
i) Write an equation for reaction between potassium manganate (vii) and iron (ii) sulphate. (1 ½ mks)

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ii) State why hydrochloric acid is not used to acidify potassium manganate (vii) solution. (1 ½ mks)

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c) 25cm³ of an acidified solution of 0.02M potassium manganate (VII) reacted exactly with 25cm³ of sodium Nitrite. Potassium permanganate (VII) reacts with sodium Nitrite according to equation below.



Calculate the concentration of sodium Nitrate in moles per litre. (04 mks)

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6. a) Determine the oxidation number of

i) Nitrogen in HNO_3 . (01 mk)

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ii) Sulphur in S_2O_8 (01 mk)

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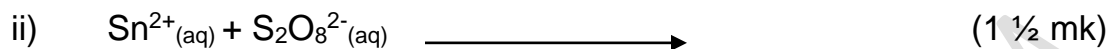
b) Write a half equation for conversion of $\text{S}_2\text{O}_8^{2-}$ to $\text{SO}_4^{2-}(\text{aq})$ ion. (01 mk)

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(c) Complete the following and balance the equation



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7. Complete the following reactions and give the IUPAC name of the organic product.



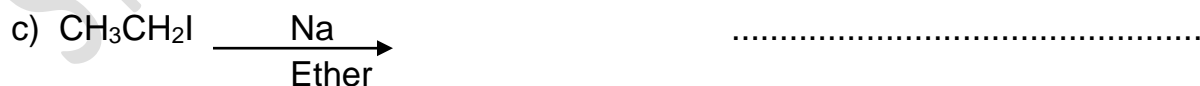
Name of product.

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Name of product

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Name of product

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Name of product

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Name of product

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END.

I BUILD THE FUTURE

ST STEPHEN'S COLLEGE BAJAJA