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5206

Your Roll No

B.Sc. Prog./II

J

AC-201 Basic Principles & Lab Operations

(NC – Admissions of 2005 & onwards)

Time 3 Hours

Maximum Marks 75

*(Write your Roll No on the top immediately  
on receipt of this question paper )*

*Attempt FIVE questions in all  
All questions carry equal marks*

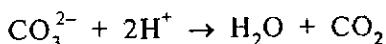
- 1 Determine the correct number of significant figures in the answer and give reason for your choice
- (a) Calculate the cost of brass in an old coin that is a pure brass. The mass of the coin is 4.351 g and price of brass is Rs 720.00 per pound. The number of grams in a pound is 453.6
- (b)  $(3.4617 \times 10^{17}) - (5.61 \times 10^{-4})$
- (c)  $3.461723 + 14.91 + 0.980001 + 5.2631$
- (d)  $0.0416 - 0.0004134$

P T O

- 2 (a) A 25.0  $\mu\text{L}$  serum sample was analysed for glucose content and found to contain 26.7  $\mu\text{g}$ . Calculate the glucose concentration of glucose in ppm and in mg/dL.

- (b) A soda ash sample is analysed by titrating the sodium carbonate with the standard 0.1288 M hydrochloride solution, required 38.2 mL HCl.

The reaction is



Calculate the percent sodium carbonate in the sample.

- (c) Describe how to prepare 250.0 mL of 0.150 M  $\text{K}_2\text{SO}_4$  with a volumetric flask.

- 3 (a) Define precision and accuracy. Explain with the help of an example.

- (b) Explain the difference between systematic and random errors.

- (c) Differentiate between absolute uncertainty and relative uncertainty.

- 4 (a) Describe the principle of colourimetry.

- (b) The peak absorbance of  $3.16 \times 10^{-3}$  M  $\text{KMnO}_4$  at 555 nm in a 1 000 cm path length of the cell is 6
- (i) Find the molar absorptivity and percent transmittance of this solution
  - (ii) What would be the absorbance if the path length were 0 100 cm ?
  - (iii) What would be the absorbance in a 1 000 cm cell if the concentration were decreased by a factor of 4 ?
- 5 (a) Which is more accurate, a transfer pipet or a measuring pipet ?
- (b) Distinguish between absorption and adsorption  
Why do you heat glassware in a drying oven, are you removing absorbed or adsorbed water
- (c) What is the difference between a homogeneous and a heterogeneous material ?
- (d) What is the purpose of calibration curve ?  
Explain
- 6 (a) What do you mean by TD and TC on glassware ?
- (b) Describe a sintered-glass crucible

- (c) Name any three drying agents used in desiccators
  - (d) What do you understand by the term tolerance and precision of glassware
- 7
- (a) Describe a typical single pan balance
  - (b) Explain the position of Zero point and rest point in a balance
  - (c) Pipette should not be blown out by mouth  
Comment