उत्तर बङ्ग
विश्वविद्यालय

'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours Part-III Examination, 2022

CHEMISTRY

PAPER-X

Time Allotted: 4 Hours   Full Marks: 65

The figures in the margin indicate full marks.
All symbols are of usual significance.

Answer Question No. 1 and *five* from the rest taking at least two from each group

1.   Answer the following:

(a) What is meant by the term rancidity of oil?   2

(b) "High degree of precision may not imply accuracy". — Justify   2

(c) What is known as "separation factor" in solvent extraction?   2

(d) Convert $(1001011)_2$ into decimal.   2

(e) Distinguish between iodometry and iodimetry.   2

(f) Write the repeating unit of :   2
    (i) Nylon-66   (ii) PVC

(g) What do you mean about 'bit' and 'byte'?   2

(h) Name of an redox indicator.   1

GROUP-A

(ANALYTICAL)

2. (a) What are the important characteristics of a good ion exchanger?   2

(b) "Gelatinous precipitates are not digested" — Explain.   2

(c) Discuss the use of complexing agents in solvent extraction.   2

(d) Explain the term ion exchange capacity.   2

(e) Ion exchange capacity of weak cation exchanger depends on the pH of medium.   2
    Why?

3. (a) Write about 'determinate' and 'indeterminate' errors. How are determinate error 2+3
    minimised?

(b) Discuss the role of Zimmermann-Reinhardt solution in the estimation of Fe^{+2} 3
    against $KMnO_4$ solution.

(c) What is 'operating system' in a computer segment?   2

4. (a) In acidic medium how does the reduction potential of MnO_4^-/Mn^{2+} system vary with pH? — 3

   (b) What are the differences between coprecipitate and postprecipitate? How is coprecipitation minimised? — 2+2

   (c) What is washing liquid? AgCl (s) precipitate should not be washed with pure water rather it should be washed with very dilute nitric acid solution. — Explain. — 1+2

5. (a) Why is slurry of ion exchange resin packed in the column instead of dry packing of resin? — 2

   (b) What are the differences between column chromatography and thin layer chromatography? — 2

   (c) What are the functions of $SnCl_2$ and $HgCl_2$ in the Fe(III) estimation? — 2

   (d) Analysis of a sample of iron ore gave the following percentage value of iron content: 7.08, 7.12, 7.16, 7.09, 7.14 and 7.21. Calculate the mean, median, standard deviation and coefficient of variation for the values. — 4

GROUP-B
(INDUSTRIAL)

6. (a) Compare and contrast between low temperature carbonisation and high temperature carbonisation of coal. — 3

   (b) What is meant by cracking of petroleum products? What are the advantages of catalytic cracking over thermal cracking? — 1+3

   (c) Write down the differences between natural fibre and synthetic fibre. — 3

7. (a) Discuss briefly about the setting of Cement. — 4

   (b) What are the advantages of detergent over soap as cleansing agent? — 3

   (c) Differentiate between natural rubber and vulcanized rubber. — 3

8. (a) Define Sulpha drugs. Write the therapeutic activity of aspirin as drug. — 2+2

   (b) Write the structure of the repetitive unit of each: — 1+1
       (i) Viscose rayon   (ii) Terylene

   (c) Give an example of optical brightener used in detergent. — 1

   (d) What is the importance of glazing of porcelain articles and how is it done? — 3

9.   Write short notes on (any *four*): — $2\frac{1}{2} \times 4 = 10$

   (a) Triple super phosphate
   (b) Portland cement
   (c) Paint failure
   (d) Borosilicate glass
   (e) Iodine value.

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