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AI—239—2017

FACULTY OF SCIENCE

M.Sc. (Second Year) (Third Semester) EXAMINATION

NOVEMBER/DECEMBER, 2017

(CBCS Pattern)

INORGANIC CHEMISTRY

Paper XVI (CH-534/1)

(Analytical Chemistry)

(Friday, 17-11-2017)

Time : 2.00 p.m. to 5.00 p.m.

Time—Three Hours

Maximum Marks—75

N.B. :— (i) Attempt All questions.

(ii) Figures to the right indicate full marks.

1. Attempt any *three* of the following : 15
 - (a) State the principle of chronopotentiometry.
 - (b) Define the term flash point and give an appropriate method to determine it.
 - (c) How moisture is determined from low-moisture foods ?
 - (d) How radioactive wastes in water are monitored ?
 - (e) Classify different types of drugs with examples of each.
2. Attempt any *three* of the following : 15
 - (a) What is the composition of human blood ? Give details.
 - (b) Explain various factors that affect the thermogram in TGA.
 - (c) What are the pollutants responsible for hardness of water ? Describe a method to analyse it.
 - (d) Explain the enzyme catalysed reaction in voltametry with an example.
 - (e) Discuss the significance of crude fibre in daily diet and give method to analyse it.

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3. (a) Answer the following :

What is the principle of Amperometric titrations ? Give various applications of it. 7

Or

Discuss the following :

Method to determine blood sugar.

(b) Answer the following :

Give the proximate analysis of solid fuels. 8

Or

Discuss the following :

Method to determine alkalinity of water.

4. (a) Answer the following :

Give the principle of DTA and explain the factors affecting DTA curves. 7

Or

Discuss the following :

Define the term dissolved oxygen and describe the method to determine COD.

(b) Answer the following :

Discuss the method of determining total nitrogen from soil sample. 8

Or

Solve the following :

Calculate the percentage of calcium oxalate dehydrate and calcium oxide in 5 g mixture if it loses 2.1 g weight at 700°C.

[At wt : Ca = 40, C = 12, O = 16, H = 1].

5. (A) Choose the *correct* alternatives : 5

(i) measures the difference in temperature between the sample and the reference when they both are put under the same heat.

(a) DTA

(b) TGA

(c) GEA

(d) DMA

- (ii) Quartz crystal microbalance is used for measuring smaller samples of the order of a with conventional TGA.
- (a) gm (b) μg
 (c) ng (d) mg
- (iii) A Bomb-calorimeter is a calorimeter used in measuring the heat of combustion of a particular reaction.
- (a) Constant-volume (b) Constant-temperature
 (c) Constant-pressure (d) Constant-time
- (iv) Temporary hardness is due to
- (a) CaSO_4 (b) CaCl_2
 (c) CaCO_3 (d) Calcium bicarbonate
- (v) pH of the soil is generally
- (a) acidic (b) basic
 (c) neutral (d) highly acidic
- (B) Write short notes on any *two* :
- (i) Calorific value of fuel
 (ii) BOD
 (iii) Microscopic examination of foods.

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