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GIET UNIVERSITY, GUNUPUR – 765022
M. Sc. (Third Semester) Examinations, December – 2022
20CHPC301 – Analytical Chemistry-I
(Chemistry)

Time: 3 hrs

Maximum: 70 Marks

(The figures in the right hand margin indicate marks.)

PART – A

- Q.1. Answer ALL Questions **(2 x 10 = 20 Marks)**
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|---|-----|----------------|
| a. Describe the TGA curve of Calcium oxalate monohydrate. | CO1 | K ₂ |
| b. Describe the TGA curve of AgNO ₃ monohydrate. | CO1 | K ₂ |
| c. Write Ilkovic equation. | CO2 | K ₁ |
| d. Explain the instrumentation of Amperometry. | CO2 | K ₁ |
| e. Explain the principle of photo electron spectroscopy. | CO3 | K ₁ |
| f. Calculate the angle which (a) first order reflection & (b) Second order reflection will occur in a X-ray spectrometer when X-ray of wave length 1.54 Å are diffracted by the atoms of a crystal given that the inter planner distance of 4.04 Å. | CO3 | K ₂ |
| g. A 0.5 g of coal sample on ultimate analysis produced 1.60 g of CO ₂ and 0.225 g of water. Find out the percentage of carbon and hydrogen of sample. | CO4 | K ₂ |
| h. Write application of gas chromatography. | CO4 | K ₂ |
| i. Explain limiting Current. | CO2 | K ₁ |
| j. Classify fuels on the basis of state of aggregation | CO1 | K ₁ |

PART – B**(10 x 5 = 50 Marks)**Answer ANY FIVE questions

- | | Marks | CO# | Blooms Level |
|--|-------|-----|----------------|
| 2. a. Write the Principle, and Instrumentation of TGA curve. | 6 | CO1 | K ₁ |
| b. Explain power compensation DSC. | 4 | CO1 | K ₂ |
| 3.a. Write the Principle and Instrumentation of DTA. | 6 | CO1 | K ₁ |
| b. Write the Application of TGA curve. | 4 | CO1 | K ₂ |
| 4. a. Write the Principle, components and Instrumentation of Cyclic Voltammetry. | 6 | CO2 | K ₂ |
| b. Derive Bragg's law. | 4 | CO3 | K ₁ |
| 5.a. There are two analyst x & y who determine the percentage of the paracetamol in the same brand of tablet. The standard value of Paracetamol in that tablet is 100 % and observations are given below:
Analyst x: 99.80, 99.90, 100, 99.30
Analyst y: 98.75, 98.75, 98.80, 98.80
Who has done more accurate analyst? | 6 | CO3 | K ₂ |
| b. Differentiate Between Voltametry and Polarography | 4 | CO2 | K ₁ |
| 6. a. Explain types of Error. | 6 | CO4 | K ₁ |
| b. Explain Residual Current, and Migration Current. | 4 | CO4 | K ₁ |

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|-------|--|---|-----|----------------|
| 7.a. | Calculate the angle which (a) first order reflection &(b) Second order reflection will occur in a X-ray spectrometer when X-ray of wave length 1.54 \AA are diffracted by the atoms of a crystal given that the inter planner distance of 4.04 \AA . | 6 | CO3 | K ₂ |
| b. | For first order diffraction by a crystal plane having $d = 2.3 \text{ \AA}$ in a solid observed at the angle of 30° . Using the same radiation and first order diffraction, $\Theta = 60^\circ$ for another solid. Calculate the d value of second solid. | 4 | CO3 | K ₂ |
| 8. a. | Explain different types of amperometric titration. | 6 | CO1 | K ₁ |
| b. | A coal having following composition by weight C= 90%, O= 0.3%, N=0.5%, ash=2.5%, S=0.5%. The NCV=8925.28 K cal/Kg calculate % H and GCV. | 4 | CO1 | K ₁ |

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