**Q 1**- Write the chemical equation (structure) for the following. (4 M)

1. Determination of iron in water.
2. Determination of sulphate ion

**Q2-** Give the reason for the following? (6M) 1 .Flame photometer used for the determination of alkali and alkali earth metals?

2. Using a quartz cell in UV spectroscopy?

1. Addition of sodium chloride- hydrochloric acid mixture to a solution that contain sulphate ion before adding the precipitating agent?

Q3- (4M)

1. What is the concentration of a sodium (23g/mol), in parts per million, if 0.02 gram of Na3PO4 (163.94 g/mol) is dissolved in 1000 grams of water?
2. Prepare 100ml of 0.1N HCl from a concentrated solution that has a specific gravity of 1.18 and is 37% (w/w) HCl. Atomic weight (H=1, Cl=35.45) g/mol.

**Q4-** The following results were obtained for turbidimetric analysis of a set standard SO4-2 solution. draw the graph (between Absorbance and concentration) and then calculate the concentration of sulphate ion in the unknown as gm/1000ml. (6M)

|  |  |
| --- | --- |
| ppm | Transmittance (T) |
| 0 | 1 |
| 10 | 0.646 |
| 20 | 0.417 |
| 30 | 0.269 |
| 40 | 0.174 |
| Unknown | 0.538 |