|  |
| --- |
| **SUE.gifSalahaddin University****College Science****Environmental Health and Science****Second Stage (2022-2023)****Practical Environmental Indices** |

**Q1/ Calculate the drinking water quality index of the river, by using BIS methods.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameters** | **pH** | **EC** | **TDS** | **T.alk** | **T.har** | **Ca** | **Mg** | **Nitrate** | **Cl** | **SO4** | **Flu** | **Fe** |
| **Rivers** | **7.5** | **850** | **350** | **199.4** | **280** | **40** | **35** | **50** | **150** | **40** | **1.5** | **2** |
| **Limited** | **8.5** | **2000** | **1000** | **200** | **300** | **75** | **30** | **45** | **250** | **200** | **1** | **0.3** |
| **wi** | **3** | **3** | **5** | **2** | **3** | **2** | **2** | **5** | **3** | **3** | **5** | **2** |

**Q2/ From the following parameters calculate EF?**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Metals** | **As** | **Cd** | **Cr** | **Hg** | **Ni** | **Zn** | **Pb** | **Fe** |
| **Concentration** | **20** | **1** | **120** | **2** | **40** | **100** | **40** | **301** |
| **Background** | **8.5** | **0.44** | **77** | **0.1** | **25** | **65** | **23** | **200** |

**Q3/ Calculate the stander deviation of COD of 400 sites along greater Zab river.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **COD mg.l-1** | **15-25** | **25-35** | **35-45** | **45-55** | **55-65** | **65-75** | **75-85** |
| **Number of sites** | **30** | **40** | **100** | **110** | **80** | **30** | **10** |

**Q4/ Measure the air quality index of atmosphere around Erbil city, When O3 ppb=125, PM2.5=100, CO ppm= 18.5**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **AQI categories** | **AQI range** | **O3 ppb** | **PM2.5** | **CO ppm** |
| **Good** | **0-50** | **0-59** | **0-12** | **0-4.4** |
| **Moderate** | **51-100** | **60-75** | **12.1-35.4** | **4.5-9.4** |
| **USG** | **101-150** | **76-95** | **35.5-55.4** | **9.5-12.4** |
| **Unhealthy** | **151-200** | **96-115** | **55.4-150.4** | **12.5-15.4** |
| **Very Unhealthy** | **201-300** | **116-374** | **150.5-250.4** | **15.5-30.4** |
| **Hazardous** | **301-500** | **375-408** | **250.5-350.4** | **30.5-40.4** |

**Q5/ Define Environmental Index?**

**Q6/ Write Soil Factors?**

**Q7/ What AQI?**

**Q8/ What is important of AQI?**

**Q9/ What is IWQI?**

**Q10/ Write laws of IWQI?**

**Q11/ A sample of 450 soil road sites from Erbil city was taken and the average of lead was found to be 220 µg.kg-1 with a standard deviation of 30 µg.kg-1 . Could the mean level of lead in the population be 95 µg.kg-1.**

**Q12/ Measure the air quality index of atmosphere around Erbil city, When O3 ppb=125, PM2.5=100, CO ppm= 18.5**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **AQI categories** | **AQI range** | **O3 ppb** | **PM2.5** | **CO ppm** |
| **Good** | **0-50** | **0-59** | **0-12** | **0-4.4** |
| **Moderate** | **51-100** | **60-75** | **12.1-35.4** | **4.5-9.4** |
| **USG** | **101-150** | **76-95** | **35.5-55.4** | **9.5-12.4** |
| **Unhealthy** | **151-200** | **96-115** | **55.4-150.4** | **12.5-15.4** |
| **Very Unhealthy** | **201-300** | **116-374** | **150.5-250.4** | **15.5-30.4** |
| **Hazardous** | **301-500** | **375-408** | **250.5-350.4** | **30.5-40.4** |

**Q13/** **On Jan 10, 2009, the following air quality data have been recorded in Baghdad. Calculate and report AQI. NO2 = 550 ppb, PM10 = 224 µg/m3, CO = 25µg/m3 and O3= 250 ppb.**



**Q14/ What is Geoaccumulation Index?**

**Q15/ What is Enrichment Factors?**

**Q16/ What Ecological risk assessment?**

**Q17/ Define Composting?**

**Q18/ Write types of composting?**

**Q19/ What is solid waste management?**

**Q20/ Write compost quality index parameters?**

**Q21/ What is C/N?**

**Q22/ Write laws of CQI?**

**Q23/ Define Biodiversity?**

**Q24/ Define Species diversity?**

**Q25/ Define Genetic diversity?**

**Q26/ What is Shannon Index?**

**Q27/ What is Simpson Index?**

**Q28/ What is Similarity Index?**

**Q29/ Define Water Quality Index?**

**Q30/ Write laws of WQI?**

**Q31/ Write roles color in AQI?**

**Q32/ Why AQI having health messages?**

**Q33/ Q2/ From the following parameters calculate Igeo index?**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Metals** | **As** | **Cd** | **Cr** | **Hg** | **Ni** | **Zn** | **Pb** | **Fe** |
| **Concentration** | **20** | **1** | **120** | **2** | **40** | **100** | **40** | **301** |
| **Background** | **8.5** | **0.44** | **77** | **0.1** | **25** | **65** | **23** | **200** |

**Q34/ Calculate the standard error of COD of 400 sites along greater Zab river.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **COD mg.l-1** | **15-25** | **25-35** | **35-45** | **45-55** | **55-65** | **65-75** | **75-85** |
| **Number of sites** | **30** | **40** | **100** | **110** | **80** | **30** | **10** |

**Q35/ Calculate the CV% of COD of 400 sites along greater Zab river.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **COD mg.l-1** | **15-25** | **25-35** | **35-45** | **45-55** | **55-65** | **65-75** | **75-85** |
| **Number of sites** | **30** | **40** | **100** | **110** | **80** | **30** | **10** |

**Q36/ Define Vermicomposting?**

**Q37/ What is leachate pollution Index?**

**Q38/ What Waste water index?**

**Q39/ What are difference between WQI and IWQI?**

**Q40/ Calculate the drinking water quality index of the river, by using BIS methods.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameters** | **pH** | **EC** | **TDS** | **T.alk** | **T.har** | **Ca** | **Mg** | **Nitrate** | **Cl** | **SO4** | **Flu** | **Fe** |
| **Rivers** | **7.5** | **850** | **350** | **199.4** | **280** | **40** | **35** | **50** | **150** | **40** | **1.5** | **2** |
| **Limited** | **8.5** | **2000** | **1000** | **200** | **300** | **75** | **30** | **45** | **250** | **200** | **1** | **0.3** |
| **wi** | **3** | **3** | **5** | **2** | **3** | **2** | **2** | **5** | **3** | **3** | **5** | **2** |

**Q41/ From the following parameters calculate EF and Igeo index?**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Metals** | **As** | **Cd** | **Cr** | **Hg** | **Ni** | **Zn** | **Pb** | **Fe** |
| **Concentration** | **20** | **1** | **140** | **2** | **60** | **110** | **40** | **301** |
| **Background** | **8.5** | **0.44** | **77** | **0.1** | **25** | **65** | **23** | **200** |

**Q42/ The following data shows the concentration of heavy metals mg/kg in soil, Calculate the potential ecological risk index RI?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **As** | **Cd** | **Cr** | **Cu** | **Pb** | **Zn** |
| **Soil** | **60.6** | **2.86** | **16.76** | **245.7** | **45.98** | **378.98** |
| **Background** | **15** | **1** | **90** | **50** | **70** | **175** |
| **T*f*** | **5** | **30** | **10** | **5** | **1** | **2** |

**Q43/ Write Summery about AQI?**

**Q44/ Why AQI more successful than PSI?**

**Q45/ What is history of AQI?**

**Q46/ Write steps of water quality index calculation?**

**Q47/ Write sources and kinds of pollutants effects on human health?**

**Q48/ What are soil indicators?**

**Q49/ Why are indicators important?**

**Q50/ Define soil quality?**