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| Salahaddin University–Erbil |  | Module: | Mathematical Analysis |
| College of Basic Education | Stage: | Third |
| Department: Mathematics | Round: | Second |
|  First Semester Examination 2022-2023 | Time: |  2 Hours |

Q1: Define an ordered field F, and show that for any $a,b\in F,$

 if $a<b$,and $0<c$ then $ac<bc$ . (10 Marks)

Q2: Define infinite set, and show that $A=\{…,-8,-4,0,4,8,….\}$is an infinite set.

 (10 Marks)

Q3: State Dense of rational numbers, show that between any two distinct real numbers, there is infinite set of rational number. (10 Marks)

Q4: Use $(ε,N) $method to show that a sequence $\left\{\frac{1}{n}\right\}$ converges to$ 0$. (10 Marks)

Q5: Prove or disprove the following: (5+5+5+5) Marks

1. If $a\in Q and b\in Q^{c},$ then $(a+b)\in Q^{c}$ .
2. If $\{a\_{n}\}$ converges to $a\_{0}$ and $\{b\_{n}\}$ converges to $b\_{0}$ , then $\left\{a\_{n}.b\_{n}\right\} $converges to $a\_{0}$.$b\_{0}$.
3. $Inf(\left\{\frac{n+1}{n}\right\})=0$.
4. $\{\frac{1-3^{n}}{4^{n}}\}$ is a Cauchy sequence.

 Examiner: Dr. Sami Ali Hussein