

Raniganj Girls' College

Department of Mathematics

SEM-ii, Mathematics(hons)

Course code: BSCHMTMC201

Course name: Real Analysis

Short questions

1. Answer any five questions:

5*2=10

- a. Prove that between any two rational numbers there is another rational number.
- b. Let $S = \{(-1)^m + 1/n ; m, n \in \mathbb{N}\}$ Find the derived set of S.
- c. Give an example to show that an unbounded sequence may have a convergent sub sequence .
- d. $\{x_n\}$ be a sequence of non-negative terms converge to l . prove that $l \geq 0$.
- e. State Cauchy General principle of convergence.
- f. Let A,B be subsets of R and $A \subset B$, then prove that $A' \subset B'$, A' , B' are derived set of A and B.
- g. What is meant by saying that ' S possesses heine Borel property ' ?
Does the set $S = \{1/n : n \in \mathbb{N}\}$ possess this property? Justify your assertion.
- h. Can a non – empty finite set be a neighbourhood of any of its points ?
Give reason.