Mid-West University

Examinations Management Office

Surkhet, Nepal

End Semester Examination-2080

Level: B.Ed. / V Semester FM: 60

Time: 3.00 hrs. PM: 30

Sub: Fundamentals of Real Analysis (MATH 451)

Candidates are required to give their answers in their own words as far as practicable.

Attempt All the Questions:

Group "B" 6×5 = 30

1. Define bounded set. The set R^+ of positive real number is bounded below and unbounded above.

2. A non-empty sub set S of R is neighbourhood of a point iff $\exists\, n \in N$ such that $\left(a - \frac{1}{n}, a + \frac{1}{n}\right) \subset N$.

3. The set of limit points of a bounded sequence $\langle u_n \rangle$ is bounded.

Or

A monotonic sequence $\langle u_n \rangle$ is convergent iff it is bounded.

4. State cauchy's root test. Test the convergence of $\sum_{n=1}^{\infty}\left(1 + \frac{1}{n}\right)^{-n^2}$

5. If $\lim_{x \to a} f(x) = l$, and $\lim_{x \to a} g(x) = m$ then $\lim_{x \to a} |f(x) \pm g(x)| = l \pm m$.

6. Define right hand derivative. If f is derivable at x and is one-one on some neighborhood of x then the inverse off is derivable at f(x) and $(f^{-1})'\ (f(x)) = \frac{1}{f'(x)}$.

Or

The set of all rational number is countable.

Group "C" 2×10 = 20

7. Show that the series. $1 + \frac{x}{2} + \frac{2!}{3^2}x^2 + \frac{3!}{4^3}x^3 + \frac{4!}{5^4}x^4 + \cdots$ is convergent by Logrithmic test.

8. Define convergent sequence with an example. A sequence u convergent to L if and only if for $\varepsilon > 0\ \exists\, m \in N$ such that $|u_n - l| < \varepsilon\ \forall\, n \geq m$.

Or

State and prove cauchy's mean value theorem.

THE END