

M.Sc. Degree Examinations - Even Semester 2021

II Year IV Semester

Functional Analysis

Max Marks: 25

Answer any Five questions (5 * 5 = 25)

1. State and prove Minkowski's inequality
2. If N is a normed linear space, then prove that the closed unit sphere S^* in N^* is a compact Hausdorff space in the weak * topology.
3. State and prove uniform boundedness theorem
4. If M is a proper closed linear subspace of a Hilbert space H , then prove that there exists a non-zero vector z_0 in H such that $z_0 \perp M$.
5. Define normal operators. If T is an operator on H , then prove that T is normal if and only if its real and imaginary parts commute.
6. Justify: The spectrum of x is empty or not.
7. If f_1 and f_2 are multiplicative functionals on A with the same null space M , then prove that $f_1 = f_2$.