THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

Re-accredited (2nd Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

Backlog Arrear Examination, March 2021

PGM 4431   **ALGEBRA-I**   **75 Marks**

Time: 3 Hrs

Answer any FIVE Questions   **5 X 15 = 75**

1. State and prove Cauchy's theorem for abelian groups.

2. If p is a prime number and $p^\alpha \setminus o(G)$, then prove that G has a subgroup of order p^α.

3. State and prove first Sylow's theorem

4. State and Prove the Jordan Holder theorem.

5. Prove that an integral domain R has the gcd property iff R has the lcm property.

6. Prove that every PID is a UFD.

7. State and Prove the Hilbert Basis theorem.

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