

Assignment
Subject: Mathematics
6th Semester (MAJOR)
Paper: M604
(Discrete Mathematics)

Full Marks: 15

Instruction: After completing your assignment, save it as a pdf and name it as “NAME_RollNo_M604_major” and then mail it to mathematics.adp.2021@gmail.com . Here, type your name and roll no in the place of NAME and RollNo while naming the file.

1. Answer the following questions:

2 x 3 =6

a. State the Peano's Axioms.

b. Prove that for all natural numbers (say, n) and for $x \geq -1$;
 $(1 + x)^n \geq 1 + nx$ using Mathematical Induction.

c. State Fermat's Little Theorem. Using Fermat's Little theorem, find
 $2^{20} + 3^{30} + 4^{40} + 5^{50} + 6^{60} \pmod{7}$

2. State and prove the Division Algorithm.

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3. State and prove the Chinese Remainder Theorem.

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