

Course outline

How does an NPTEL online course work?

Propositional Logic

Predicate Logic, Proof Strategies and Induction

Sets and Relations

Equivalence Relations, Partitions, Partial Orderings and Functions

Theory of Countability

Combinatorics Part I

Combinatorics Part II

Graph Theory Part I

Graph Theory Part II

Number theory

- Modular Arithmetic
- Prime Numbers and GCD
- Properties of GCD and Bézout's Theorem
- Linear Congruence Equations and Chinese Remainder Theorem
- Uniqueness Proof of the CRT
- Fermat's Little Theorem, Primality Testing and Carmichael Numbers

 Quiz : Week 10 Assignment

Abstract Algebra : Part I

Abstract Algebra : Part II

Video download

Live Session

Text transcripts

Week 10 Assignment

The due date for submitting this assignment has passed.

Due on 2021-03-31, 23:59 IST.

As per our records you have not submitted this assignment.

 1) Select the correct option(s) from the following : 1 point

- An integer a has a multiplicative inverse modulo n , if and only if the $\gcd(a,n) = 1$
- Checking the primality of any integer can be done using prime factorization method within an upper bound of 60 minutes
- There are an infinite number of integers but the number of prime integers is finite
- None of these options are correct

No, the answer is incorrect.
Score: 0

Accepted Answers:
An integer a has a multiplicative inverse modulo n , if and only if the $\gcd(a,n) = 1$

 2) Which of the following are the possible value(s) of x such that it leaves remainder of 1, 2, 3 and 4 when divided by 5, 7, 9 and 11, respectively? 1 point

- 1731
- 2379
- 4548
- 5196

No, the answer is incorrect.
Score: 0

Accepted Answers:
1731
5196

 3) Given $49x \equiv 1 \pmod{72}$, and $37y \equiv 97 \pmod{125}$ the value of $xy =$: 1 point

- 925
- 54
- 180
- 150

No, the answer is incorrect.
Score: 0

Accepted Answers:
150

 4) Select value(s) of x so as to simultaneously satisfy the equations $x \equiv 2 \pmod{5}$, $x \equiv 3 \pmod{7}$, and $x \equiv 5 \pmod{11}$. 1 point

- 16362
- 8277
- 12512
- 192

No, the answer is incorrect.
Score: 0

Accepted Answers:
16362
8277
12512
192

 5) Given $2^{10000} \equiv x \pmod{33}$, the value of x is 1 point

- 1
- 2
- 4
- 6

No, the answer is incorrect.
Score: 0

Accepted Answers:
1

 6) Least Common Multiple (LCM) of two integers a and b is defined as the smallest positive integer that is divisible by both a and b . Let $\text{lcm}(a,b)$ denote the LCM of a and b . Select the correct option(s) from the following: 1 point

- For all positive integers a and b , $\text{lcm}(a,b) \cdot \gcd(a,b) = ab$
- For all positive integers a and b , $\text{lcm}(a,b) = ab$
- There exist positive integers a and b such that $\text{lcm}(a,b) > ab$
- For all positive integers a and b , $\text{lcm}(a,b) + \gcd(a,b) = ab$

No, the answer is incorrect.
Score: 0

Accepted Answers:
For all positive integers a and b , $\text{lcm}(a,b) \cdot \gcd(a,b) = ab$

 7) What are the last two digits of 49^{19} ? 1 point

- 49
- 29
- 89
- 99

No, the answer is incorrect.
Score: 0

Accepted Answers:
49

 8) If $n \in \mathbb{N}$ and $\gcd(n,35)=1$ what is $n^{12} \pmod{35}$? 1 point

- 7
- 5
- 1
- 11

No, the answer is incorrect.
Score: 0

Accepted Answers:
1

 9) Choose the incorrect statement(s) from the following? 1 point

- Carmichael numbers can be proved composite using Fermat's primality testing
- Fermat's little theorem can decide whether a given number is a prime number or not
- CRT can be used to solve system of linear congruence equations
- CRT always guarantees a solution for any given system of linear congruence equations

No, the answer is incorrect.
Score: 0

Accepted Answers:
Carmichael numbers can be proved composite using Fermat's primality testing
Fermat's little theorem can decide whether a given number is a prime number or not
CRT always guarantees a solution for any given system of linear congruence equations

 10) Find x such that $5x \equiv 2 \pmod{7}$, $x \equiv 11 \pmod{13}$ and $x \equiv 17 \pmod{119}$ 1 point

- 13 mod 10829
- 168 mod 10829
- 255 mod 10829
- None of the given options

No, the answer is incorrect.
Score: 0

Accepted Answers:
None of the given options