

QN	<p style="text-align: center;">TYBSc(Mathematics) Subject: MTH-506(B):Number Theory Question Bank</p>	ANS
1)	Difference of two distinct prime numbers is -----. A) odd and prime B) even and composite C) neither prime nor composite D) all of the above	B
2)	A solution of Diophantine equation $10x + 6y \equiv 110$ is -----. A) (7,5) B) (8,5) C)(6,5) D) none of the above	B
3)	If gcd of two numbers is 1 , then the two numbers are said to be -----. A) prime numbers B) co-prime numbers C) composite numbers D) rational numbers	B
4)	Euclid's algorithm is used for finding -----. A) gcd of two numbers B) gcd of more than two numbers C) lcm of two numbers D) none of the above	A
5)	A linear Diophantine equation $ax + by = c$ has a solution iff $d \mid c$ where d is ----- . A) gcd (a , c) B) gcd (a , b) C) gcd (b , c) D) lcm (a , b)	B
6)	Which of the following is an odd composite number? A) 83 B) 95 C) 67 D) 37	B
7)	What is last digit of 2^{100} is -----. A) 2 B) 4 C)6 D) 8	C
8)	An integer $p > 1$ is called a ----- , if its only positive divisors are 1 and p . A) composite number B) prime number C) rational number D) none of the above	B
9)	The number of primes lies between 1 and 50 = -----. A) 15 B) 12 C) 16 D) 17	A
10)	Which one of the following is a prime number? A) 161 B) 171 C) 173 C) 221	C

11)	System of linear congruences has ----- solutions A) Infinite B) unique C) both A and B D) none of the above	B
12)	Let $d = \gcd(a, n)$ then $ax \equiv b \pmod{n}$ has solution if and only if -----. A) $b \mid d$ B) $d \mid b$ C) $d \mid a$ D) $d \mid n$	B
13)	The congruence $ax \equiv b \pmod{n}$ is called A) linear congruence B) quadratic congruence C) Cubic Congruence D) none of the above	A
14)	The number 5233779 is divisible by -----. A) 11 B) 5 C) 9 D) 7	C
15)	What is the remainder when 48 is divided by 3? A) 0 B) 3 C) 16 D) 48	A
16)	The only prime of the form $N^3 - 1$ is -----. A) 3 B) 5 C) 7 D) 11	C
17)	Which of the following is true ? A) $\gcd(4, 5) = 5$ B) $\gcd(4, 5) = 4$ C) $\gcd(4, 5) = 3$ D) $\gcd(4, 5) = 1$	D
18)	Every even integer greater than 2 can be written as the sum of two primes is known as -----. A) Fermat's number B) Goldbach conjecture C) Mersenne primes D) none of the above	B
19)	How many different factors does 48 have excluding 1 and 48 ? A) 12 B) 4 C) 8 D) 10	C
20)	The number $\sqrt{2}$ is ----- A) irrational B) rational C) prime D) none of the above	A
21)	Number of digits in decimal representation of any integers are -----. A) 2 B) 100 C) 10 D) none of the above	C
22)	When $a \equiv b \pmod{n}$ then remainder of a and b when divided by n are -----. A) Same B) different D) none of the above	A

	A) $6 \pmod{9}$ B) $8 \pmod{9}$ C) $9 \pmod{9}$ D) none of the above	
	The numbers $2^n - 1, n > 1$ are called as -----. A) perfect numbers B) Mersenne numbers C) Fermat numbers 36) D) none of the above	B
37)	The last digit of Fermat's number $F_n, n \geq 2$ is -----. A) 1 B) 5 C) 7 D) 10	C
38)	For $m > n \geq 0$, the Fermat's numbers F_m and F_n are -----. A) relative prime B) composite number C) even number D) odd number	A
39)	The Mersenne number M_{19} is -----. A) perfect number B) prime number D) pseudo prime number C) composite number	B
40)	If $2^n \equiv 2 \pmod{n}$ then n is called as -----. A) Prime number B) pseudo prime number C) odd number. D) even number	B
41)	If for some integer $k > 1, 2^k - 1$ is a prime then $2^{(k-1)}(2^k - 1)$ is -----. A) Fermat number B) perfect number C) Mersenne number D) none of the above	B
42)	The prime factors of $2^{11} - 1$ are -----. A) 89, 23 B) 45, 46 C) 56, 33 D) 57, 38	A
43)	An integer having the remainders 3, 11, 15 when divided by 10, 13, 17 respectively is -----. A) 1003 B) 1103 C) 1203 D) 1303	B
44)	Which of the following is a Mersenne prime number? A) M_6 B) M_7 C) M_4 D) M_8	B
45)	Let p be a prime and $ab \equiv 1 \pmod{p}$ with $b \equiv a \pmod{n}$ then -----. A) $ab \equiv a \pmod{p}$ B) $b^2 \equiv a \pmod{p}$ C) $a^2 \equiv 1 \pmod{p}$ D) none of the above	C

46)	Which of the following is a prime Fibonacci number? A) 5 B) 7 C) 11 D) 17	A
47)	Two successive odd integers p and p+2 which are primes are called -----. A) Pseudo primes B) twin primes C) Mersenne primes D) none of the above	B
48)	If p is prime and p not divides a then ----- . A) $a^{p-1} \equiv 1 \pmod{p}$ B) $a^p \equiv 0 \pmod{p}$ C) $a^p \equiv 1 \pmod{p}$ D) none of the above	A
49)	The integer of the form $2^{2n}+1$, $n \geq 0$ is called as -----. A) Perfect number B) Fermat number C) Mersenne number D) none of the above	B
50)	Which of the following is not a Mersenne prime number? A) M_3 B) M_2 C) M_4 D) M_5	C