QN	**TYBSc(Mathematics)** **Subject: MTH-506(B):Number Theory** **Question Bank**	**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 | d B) d | b C) d | a D) d | 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**

23)	a≡b(mod n) means ---------. A) n | (a - b) B) a = b + qn C) both A and B D) none of the above	**C**
24)	If a≡b(mod n) and b≡c(mod n) then ---------. A) ac ≡ bc(mod n) B) a ≡ c(mod n) C) both A and B. D) none of the above	**B**
25)	What is the remainder when 1! + 2! + 3! + 4! is divided by 12 ? A) 0 B) 9 C) 12 D) 3	**B**
26)	When 16! is divided by 17 then remainder is --------. A) 1 B) -1 C) 0 D) none of the above	**B**
27)	The first perfect number is -------. A) 6 B) 24 C) 8 D) 4	**A**
28)	When 5^{10} is divided by 11, the remainder is ---------. A) 5 B) 0 C) 1 D) 11	**C**
29)	If (p - 1)! ≡ -1 (mod p) then p is a ---------. A) composite number B) odd number C) finite number D) prime number	**D**
30)	Which of the following is a perfect number? A) 28 B) 27 C) 26 D) 25	**A**
31)	A composite number n is called pseudo prime if --------. A) n | (2^n+1) B) n | (2^n-1) C) n | (2^n- 2) D) none of the above	**C**
32)	If a ≡ b (mod n) then --------. A) b ≡ a (mod n) B) ac ≡ bc (mod cn) C) a^k ≡ b^k (mod n) D) all of the above	**D**
33)	If ax ≡ b (mod n) and gcd (a , n) = 1 then system has -------- solutions modulo n. A) n B) 1 C) a D) b	**B**
34)	A number when divided by 2 ,3 ,or 5 gives remainder 1. This number is -------. A) 31 B) 47 C) 49 D) 53	**A**
35)	The solution of the linear congruence 4x ≡ 5 (mod 9) is ---------.	**B**

	A) 6 (mod 9) B) 8 (mod 9) C) 9 (mod 9) D) none of the above	
36)	The numbers 2^n-1, n>1 are called as ----------. A) perfect numbers B) Mersenne numbers C) Fermat numbers D) none of the above	B
37)	The last digit of Fermat's number F_n , n ≥ 2 is ---------. A) 1 B) 5 C) 7 D) 10	**C**
38)	For m > n ≥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 ≡ 1 (mod p) with b ≡ a (mod n) then ----------. A) ab ≡ a (mod 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**