Please choose the only correct one of the four options below（4 points for each one）

1. When DEC=17，BIN should be

A.0100101 B.00010001 C.00000017 D.00101101

2. Which one is wrong

A. When Q=T,P=T, P IMPLISE Q = T

B. When Q=T,P=F, P IMPLISE Q = F

C. When Q=F,P=F, P IMPLISE Q = F

D. When Q=F,P=T, P IMPLISE Q = T

3. Which of the following is a binary of 15

A.1111 B. 1101 C. 0011 D.1011

4. Which one is not Infinite(无限的) set

A.Z B.N C.N\*N D.{1,2，3……9999999}

5. gcd（208,598）=

A.13 B.26 C.39 D.52

6. When Q = T, P = F ，the following statement is wrong

A. P AND Q is T

B. P OR Q is F

C. P IMPLISE Q is F

D. P XOR Q is F

7, When A={{1，2}，{3, 4，5}，{7，8}}，the following statement is wrong。

A、； B、{1，2}A；

C、{{4，5, 6}}A； D、{3，4，5}A 。

Please answer these questions directly（4 points for each one）

1. Please write down the truth table of (P OR Q) AND R
2. gcd(24,18)=
3. binary:110110+10011101=
4. Please describe the difference between strong induction and general induction
5. Please write down the trueth table proof (P IMPLIES Q) OR （Q IMPLIES P）is T
6. POW({1, 5, 6, 8})=
7. (300)=
8. Please describe the Well-ordering Theorem

Please judge whether the following options are correct（1.5 points for each one）

1. The set {N\*N} is countable(可数的) infinite set
2. When P = T, Q = F, Q and P = T
3. √11 is Is a rational number
4. If the human can fly, then you won’t get good grades（In mathematical logic）
5. if R has an in arrow of > = 1, that is, every point in the companion field column has at least one arrow pointing to it, then we say that it is a total.
6. Elements contained in a but not in B are difference sets.

Please give specific(具体的) answer to the following questions

1. Please prove that is an irrational number（5 points）
2. Every integer greater than 1 can be decomposed into the product of prime factors （by Well-ordering Theorem）（每一个大于1的整数都能被分解成质因数的乘积）（8 points）
3. ∀n >0, a^n is even, then a is even (Contradiction)（8 points）
4. The balance of microseconds in the center of Starr depends on two buckets of water hidden in a secret chamber. The big bucket has a capacity of 25, and the small one has a capacity of 10. If there's exactly 13 gallons of water in a bucket at any one time, stark center will collapse. According to certain rules, xuannong can fill and empty the bucket remotely through a display. We represent these machines as a state（10 points）