**2.6 Matrices**

**Determine whether each of these sets is finite, countably infinite, or uncountable. For those that are countably infinite, exhibit a one-to-one correspondence between the set of positive integers and that set.**

**a) the integers greater than 10**

This set is countably infinite. The integers in the set are 11, 12, 13, 14 ...

the correspondence is given by 1(11), 2(12), 3(13) ; in general n ( (n + 10).

**b) the odd negative integers**

This set is countably infinite. The integers in the set are −1, −3, −5, −7…

the correspondence is given by 1(−1), 2(−3), 3(−5); in general n ( −(2n − 1).

**c) the integers with absolute value less than 1,000,000**

This set is {−999, 999, −999, 998,…, −1, 0, 1,…, 998,999}. It is finite, with cardinality 1,999,999**.**

**d) the real numbers between 0 and 2**

This set is uncountable**.**

**e) the set A × Z+ where A = {2, 3}**

This set is countable.

**f ) the integers that are multiples of 10**

This set is countable.

**Q8. Give an example of two uncountable sets A and B such that A − B is**

**a) finite.**

Let A and B be the set of real numbers ; then A − B = Ø, which is finite.

**b) countably infinite.**

Let A set of real number and B set of non-integer positive number ; in symbols, B = A − Z+. Then

A − B = Z+, which is countably infinite.

**c) uncountable**

Let B be the set of positive real numbers. Then A − B is the set of negative real numbers and 0, which is uncountable.

**Q14. Show that a subset of countable set is also countable.**

If A is countable set, then we can list its elements, a1, a2, a3, …, an, . . .

Every subset of A consists of some of the items in this sequence, and we can list them in the same order in which they appear in the sequence, Thus the subset is also countable.