**Definition:-**

1. An monomorphism is :AB called split if Im() is direct summand of B.
2. An epimorphism :BC is called split if ker () is direct summand of B.

**Proposition**:-

1. For :AB be an R-homomorphism. The following statement are equivalent:
2. is split monomorphism.
3. exists a homomrphism :BA such that =.
4. For :BC be a R-homomorphism, the following are equivalent:
5. For is split epimorphism.
6. There exists a homomorphism :CB such that =.

Proof: - (1) (a)

Since Im() is direct summand of B i.e. B such that B= .

Let : B be a projection homomorphism (a) Im(), .

Let :AIm() such that (a)=(a).

(i.e.) be the restraction of

is isomorphism.

: Im() A ,then we have

Define =:BA such that (a)=( )(a)=((a))=.(a)=a=.aA.

(b)(a)  
proof:- Since =. Thus is isomorphism, where is monomorphism

is monomorphism.

**Corollary(\*):-** We have Im()ker()=B (i.e.) Im() is direct summand of B .Thus is split monomorphism.

**Corollary(\*):-** The diagram AB is com. i.e. =.

Then if is isomorphism B= Im()ker().