CONCLUSION
Conclusion

This experimental work was undertaken to investigate the effect of water stress by various methods on Pea and Amaranthus during germination period. Water stress was induced by different methods.

I. NaCl - Ion Stress.
II. PEG treatment - osmotic stress.
III. Desiccation stress.

1. Germination percent was not appreciably affected by NaCl, germination was delayed in Pea and Amaranthus under ionstress. While in osmotic stress Pea in germination percent and duration of germination was highly affected. Uptake of water was slow which delayed or restricted the processes of growth.

2. There was discerned a correlation between concentration of salt and extension of growth seedlings as also in PEG treatment which restricted extension of seedlings growth.

   Both NaCl and PEG are water stresses yet NaCl due to its ionic stress Na⁺ and Cl⁻ ion increased the osmotic pressure and osmotic stress also caused water stress. Due to stress imbitition was delayed. Desiccation stress causes water loss from seedlings and cells have to start to adjust. The stress was induced by different methods so it may affect either in the same way as there of PEG and NaCl or may be different.

3. Moisture content was not affected under salt treatment. It is well documented under saline condition plant try to adjust their osmotic balance by accumulation of organic solution specially hexose, disaccharides and proline.

   Secondly biochemical changes induce may be the same in all three stresses all three organs or may response variously as in Pea as the present investigation records.
Effect of salt stress water uptake is not affected but due to ionic stress enzyme activities was affected, while in PEG stress water uptake was lower due to restricted water enzymes activity was affected varies any of these reason can be possible explanation for the lower fresh and dry weight in stress condition.

A] Since germination is resumption of metabolic activity all enzymic activities are either triggered or activated for e.g. alpha amylase denovo synthesis while B- amylase is activated which already present in dormant seed activated activities of amylase, protease etc. rest up to the break down of stored food of cotyledon or endosperm and mobilizing sugar, amino acid etc. to the embryoaxis which is sight of physiological activities considering the PEG treatment of PEA amylase activity was not too much affected and growth of epicotyle and hypocotyle restricted.

while in Amaranthus seedlings was affected by amylase activity. It was higher then control and growth was not too much restricted.

B] Protease activity was suppressed under osmotic stress and desiccation stress in Pea and Amaranthus. Protein and aminoacids were also lowered. Here enzyme substrate relation is seen. Aminoacids content was less so synthesis of Protein was lower and Protein values were lower.

C] In case of Amaranthus Protein level was higher and aminoacids content was lower which indicated that hydrolysis of protein was prevented by enzymic activity, but synthesis of protein was higher, evidence of this was the higher protease activity under water stress.

D] Proline level was tremendously increased by desiccation treatment when seedlings loose water, at that time proline
act as a protective substance. Thus proline accumulation depend on the nature of stress imposed while it was not affected by NaCl and PEG stresses.

E] Behaviour responses of amylase and invertase activities were similar as increasing under salt stress and PEG stress while under desiccation treatments their response were inversely related.

F] Irrespective of any stress sugar level was higher in case of Pea seedlings which helps in osmoregulation. Reducing sugar concentration being indicates that they are being supplied for respiratory substances. Higher oxidation occurred to provide energy.

G] Total sugar and reducing sugar level were higher in epicotyle/hypocotyle as compared to cotyledon which suggested embryaxis is growing system requiring more energy. It also suggests translocation of sugar from cotyledon to embryaxis.

H] Amaranthus seedlings showed low content of total sugar and reducing sugar in salt and osmotic stress and invertase activity was higher indicating hydrolysis of sucrose was higher and also utilization of hexose sugar.

I] Opposite trend was seen between peroxidase activity and catalase activity under saline treatment and desiccation treatment.

J] These enzymes bear relation with respiration and toxic products such as $H_2O_2$. Both enzymes utilized common substrate $H_2O_2$ so its relation observed was inverse.

K] However in Amaranthus both activities increased under osmotic stress showing highly oxidative processes occurring during stress. In case of PEG both oxidizing activities were decreased under osmotic stress which indicated lower energy.
Although all the three stages were water stresses viz desiccation PEG there are different responses as salinity developed earlier while PEG or osmotic cause restricted availability of water in the case of desiccation there is a gradually lost of water there by cause of drought NaCl also causes water deficit but has also ionic toxic effects. During stress oxiditive and hydrolysing processes predominant as was postulated by Stocker and Slayter (1960). The present studies all in agreement of this postulations.

"The woods are lovely, dark and deep.
But I have promises to keep,
And miles to go before I sleep,
And miles to go before I sleep."

- Robert Frost.