[Time: 1 **Hour]** **[Marks:25]**

Please check whether you have got the right question paper.

N.B: 1. **All** questions are **compulsory**.
2. **Figures** to the **right** indicate **Full marks.**

Q.1 Answer **any one** of the following : **10M**

A Describe the process of gene transfer by conjugation in bacteria.

B A *Neurospora* strain that required both adenine (ad) and leucine (leu) for growth was mated to a wild type strain (ad + and leu +) following products were obtained.

	1	2	3	4	5	6	7
Spore pair 1	ad leu	ad leu	ad leu	ad +	ad +	ad +	ad leu
Spore pair 2	ad leu	+ leu	ad +	+ leu	+ leu	+ leu	+ +
Spore pair 3	+ +	+ +	+ leu	+ +	+ leu	ad +	+ +
Spore pair 4	+ +	ad +	+ +	ad leu	ad +	+ leu	ad leu
TOTAL	**67**	**16**	**11**	**2**	**2**	**1**	**1**

Find the gene and centromere distance for the two genes.

Q.2 Answer **any one** of the following : **10M**

A Give an overview of the various strategies for engineering herbicide tolerance in plants.

B Explain the application of r-DNA technology in improving starch content in potato.

Q.3 Write short notes on **any one** of the following : **05M**

A Jumping genes

B Monellin as a sweetener

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