Time: 2 ½ Hours **Max. Marks: 60**

Instructions: 1. All questions are compulsory.
2. Draw neat and labeled diagram wherever necessary.
3. Figures to the right indicate full marks.

Q.1. Three new strains of Ragi denoted as A, B and C were developed at an agricultural research station and put under a yield trial in randomized blocks against an existing strain D. Determine whether the variation in yield is due to strains. [F (Crit) =3.86 at 5% level of significance] **(12 M)**

BLOCK I	BLOCK II	BLOCK III	BLOCK IV
$A_{81}B_{55}$	$C_{77}D_{32}$	B_{54} C_{75}	D_{32} A_{84}
C_{74} D_{35}	A_{82} B_{54}	D_{31} A_{84}	B_{53} C_{75}

OR

Q.1. i) Explain Type I and Type II errors. **(6 M)**
ii) Limitations and advantages of Latin square experiment design. **(6 M)**

Q.2. What is the meaning of the term Score and F values? Describe its importance in sequence annotation. **(12 M)**

OR

Q.2. Define Multiple Sequence alignment. Explain CLUSTALW and steps involved in it to find MSA. **(12 M)**

Q.3. Define Buffers? Explain buffer action with Henderson – Hassel Bach equation. **(12 M)**

OR

Q.3. Give an account of the technique of Electrophoresis. Add a note on its application in biology. **(12 M)**

Q.4. Describe the components and working of Mass Spectroscopy. **(12 M)**

OR

Q.4. Give the principle of Scanning Electron Microscope. Discuss the steps involved in Biological sample preparation for electron microscopy. **(12 M)**

Q. 5. Write short note on any four of the following**: (3 Marks each)** **(12 M)**

a) Dunett's test
b) Concept of ANOVA
c) BLASTn
d) Motif finding
e) Application of Infrared Spectrometer.
f) Glass Electrodes

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