**MAHATMA GANDHI UNIVRSITY**

**B.Sc. (Model II –Vocational) Botany Degree Examination**

**Practical II – Vocational Subject – Plant Biotechnology**

**Course V &VII** (Combined)

**Basics of Molecular Cloning Techniques & Genetic Engineering**

1. **Hours 40 marks**

1. Identify the given plasmid. Name enzyme ‘X’ and write down its recognition sequence of cleavage and procedure

x

Identification : 1 mark

Tetr

Amp**r**

Enzyme X : 1 mark

Recognition sequence : 1 mark

Procedure : 2 mark (5 marks)

2. Identify the given experimental setup ‘A’. Write down the principle and procedure.

Identification : 1 mark

Principle : 1 mark

Procedure : 1 mark

(3 marks)

3. Write down the procedure for the preparation of competent cells for transformation

1. marks

4. Write down the function of the given chemical ‘B’ in bacterial transformation

1. mark

5. Prepare liquid media ‘C’ for culture of transformed cells. Write down the procedure.

Preparation : 2 marks

Procedure : 2 marks (4 marks)

6. Load the given sample ‘D’ in Agarose gel. Write down the principle and procedure for Agarose gel electrophoresis.

Loading : 3 marks

Procedure : 3 marks (6 marks)

7. Identify the given experimental setup ‘E’. Write down the principle and procedure.

Identification : 1 mark

Principle : 2 mark

(3 marks)

8. Draw a flow chart to construct a ----------- transgenic plant ‘F’ and mention its significance.

Flow chart : 2 mark

Significance : 1 mark (3 marks)

9. Comment on ‘G’

Comment : 2 mark (2 marks)

10. Viva voce (based on practical) (3 marks)

11. Record (8 marks)

**KEY :**

1. Plasmid -pBR 322

Enzyme X - ECOR1

Recognition sequence -GAATTC

CTTAAG

2. A Identification – **Southern Blotting**

Transformants on Ampicillin / IPTG, X Gal medium

3. B - Ca Cl2

* IPTG,
* XGal,
* Ampicillin,
* Nutrient Agar

4. C Preparation of 10ml or 20ml of liquid media

5. D DNA sample with bromophenol blue dye

6. E Agroinfection, Microinjection, Biolistics,

Liposome mediated gene transfer, Electroporation

7. F Herbicide resistance, Bacterium resistance,Virus resistance,

Insect resistance

9. G, Poly Ethylene Glycol, Dextran, Calcium phosphate, DMSO

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**B.Sc. (Model II –Vocational) Botany Degree Examination**

**Practical II – Vocational Subject – Plant Biotechnology**

**Course VI&VIII** (Combined)

**Plant Tissue Culture & Biotechnology for Crop Improvement**

**Time 3Hours Marks: 40**

1. Identify the explants ‘A’ and ‘B’ and comment on it.

Identification : 1 mark

Comment : 2 marks

(3x2=6 marks)

1. Prepare cotton plugs for the given tissue culture medium ‘C’

(2 marks)

1. Identify and comment on the given stages ‘D’ ‘E’ and ‘F’ in plant tissue culture

Identification : 1 marks

Comment : 2 marks

(3x 3=9 marks)

1. Sterilize and inoculate the given material ‘G’ and write own the procedure

**OR**

Subculture the given material ‘G’ and write down the procedure of subculture

Method : 3 marks

Procedure : 2 marks

(5 marks)

1. (a) Write down the chemicals added as macronutrients in MS medium

1 marks

(b) Calculate the quantity of each macronutrient to be taken for the preparation

Of---------- X concentration of 1 lit of the stock. 2 marks

(c) Calculate the volume of the above stock to be taken for the preparation of ----- lit

of MS media 1 marks

(4 marks)

6. Identify and comment on the given experiment setup ‘H’

Identification : 1 marks

Comment : 2 marks (3x1=3marks)

1. Viva voce (based on practical) (3 marks)
2. Record (8 marks)

**KEY** :

1. Explants ‘A’ and ‘B’

Nodal segment, internodes, leaf petiole, inflorescence, anthers, leaf, flower bud

1. ‘C’ Neat cotton plugs of non-absorbant cotton covered with gauze cloth.
2. ‘D’ ‘E’ and ‘F’– callus culture, shoot induction, multiple shoots, rooting culture,

Hardening, *in vitro* flowering, contaminated culture, charcoal medium.

1. ‘G’ Nodes/ leaf explant **OR** Callus culture , nodal culture.
2. ‘H’ - Paper raft nurse technique, synthetic seeds.