**MAHATMA GANDHI UNIVERSITY**

**B.Sc. DEGREE (CBCSS) BOTANY PROGRAMME**

**Semester VI -5&6(Combined) Practical**

**CELL MOLECULAR BIOLOGY AND EVOLUTION**

**&**

**BIOTECHNOLOGY AND BIOINFORMATICS**

**Questions**

**Time 3 hours Marks 40**

1. Make acetocarmine squash preparation of the root tips (**A**) supplied and identify any two stages of mitosis **(5)**  
    Preparation (1)  
    Identification (1x2)  
    Labelled Diagrams. (1x2)
2. Identify the meiotic stage in the figure/photograph (**B**). Write a note on the meiotic stage in B.  **(3)**  Identification (1)  
          Note (2)
3. Work out the problem **C** **(3)**
4. Immobilize whole cells / plant tissue (**D**)in alginate beads **(2)** Procedure / working (1)

Results (1)

1. Extract the DNA from plant material (**E**) using suitable methods  **(4)** Requirements (1)

Working (2)

Results (1)

1. Sterilize the given explant (**F**) and inoculate in to the medium supplied. Write down the sequential steps you have followed including the concentration of sterilant and time of sterilization and finial size of the inoculum used. **(5)** Steps followed (2)

Working (3)

1. Comment on **G & H** (2+2) (**4**)
2. Using molecular visualization tool Rasmol show the information of given protein **I** ( Insulin/ Haemoglobin) **(4)** Set up the colour of background (Rasmol – Background colour) (1)

Display H2 bond /Disulphide bond (1)

Display the labels specified (amino acids) (1)

Display the protein structure in model specified (1)

1. Viva voce (based on the practicals) **(2)**
2. Record **(8)**

**Instruction –Key**

1. Preference should be given for metaphase and anaphase stage . Onion root tips may be given
2. Photographs and diagrams of mriotic division may be provided
3. Elementary problems on DNA structure and replication.
4. Yeast cells /any plant tissue (meristem) can be provided
5. Suitable plant material (onion, cauliflower etc.) can be given.
6. Shoot tip/ Stem/Leaf, Nodal segment can be given as explants.
7. Equipment used in Genetic Engineering, Photographs or chemicals,Tools in Genetic Engineering / procedures or protocols/ Home page of NCBI/ Icon of Rasmol /Photographs and diagrams of cell division anomalies like lagging chromosomes, Chrmosome bridge, aneuploidy, polyploidy are to be provided
8. Tool for Rasmol has to be installed in the computer provided to the students