BIOTECHNOLOGY

PAPER 2

(PRACTICAL)

(Maximum Marks: 30)

(Time allowed: Three hours)

(*Candidates are allowed additional 15 minutes for **only** reading the paper. They must NOT start writing during this time.*)

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*Answer **all** questions.*

The intended marks for questions or parts of questions are given in brackets [ ].

Question 1

(a) You are given a petri plate labelled (**L**) containing bacterial colonies isolated from curd sample. Perform the following experiment:

Pick up a bacterial colony with the help of a needle and spread it on a clean glass slide to make a thin smear. Add a few drops of crystal violet stain to the smear and spread it evenly on the slide. Allow it to dry for 5 minutes. Next, rinse the slide gently with distilled water to wash off the excess stain. Now, add a few drops of iodine stain to the smear and keep it for two minutes. Wash off the extra stain with distilled water. Now, wash the smear with ethanol. Counter stain the smear with saffranin. Again rinse off the excess stain with distilled water. Allow the slide to dry for two minutes. Examine the slide under a light microscope.

Answer the following questions:

(i) Write your observation as seen under the microscope. **[1]**

(ii) Name the technique used in the experiment. Also, mention the use of this technique in biotechnology. **[1]**

(iii) Name the bacteria present in the culture labelled **L**. **[1]**

(b) You are provided with the photograph of a gel electrophoresis of DNA. Based on the photograph, answer the following:

(i) What do the bands seen in the photographs depict? **[1]**

(ii) Mention the basic principle involved in the process. **[1]**

(iii) Name the two major contaminants found during isolation of DNA. **[1]**

This paper consists of 3 printed pages and 1 blank page.

Question 2

You are provided with the extract of germinating pea / gram seeds (prepared in a buffer) in a beaker, labelled **E**.

(a) Mix 2% NaOH, 4% sodium potassium tartrate and 1% $CuSO_4$ in the ratio 3:3:1, in a beaker. Label it as **Solution B**.

(b) In a test tube, take 5 ml of extract of germinating pea / gram seeds, labelled **E**. Add 5 ml of **solution B** to the test tube and observe the change in the colour.

(c) In a test tube, take 2 ml of extract of germinating pea / gram seeds, labelled **E**. To this, add 5 drops of conc. HNO_3 and 1 ml of conc. NH_4OH. Observe the change. Heat the test tube over the flame for a few minutes. Observe the change.

Show it to the Visiting Examiner.

Answer the following questions:

(i) Write your observations of (b) and (c) in a tabular form: **[2]**

Experiment	Observation	Inference
(b)		
(c)		

(ii) What is the solution **B**, prepared by you, known as? **[1]**

(iii) Name the experiments performed in (b) and (c) above. **[1]**

(iv) Name the instrument used for performing quantitative analysis of substance that is present in the extract labelled **E**. **[1]**

Question 3

Identify the displayed instruments / photographs of the instruments labelled **1 to 4**.
For each instrument write:

(a) The name. **[2]**

(b) One specific use of the instrument. **[2]**

Question 4

Show the following to the Visiting Examiner for assessment.

(a) Project. **[10]**

(b) Biotechnology Practical File. **[5]**