BINDURA UNIVERSITY OF SCIENCE EDUCATION
BIOLOGICAL SCIENCES DEPARTMENT
BACHELOR OF SCIENCE HONOURS DEGREE IN BIOTECHNOLOGY
MEDICAL BIOTECHNOLOGY (BTECH423)

EXAMINATION   **2 HOURS (100 MARKS)**

INSTRUCTIONS

Answer **FOUR** (4) questions. You **MUST** answer **QUESTION 1** from Section A and any THREE (3) questions from SECTION B. Each question carries 25 marks. Where a question contains subdivisions, the mark value of each part is given in brackets. Illustrate your answer were appropriate with large clearly labeled diagrams. You should not spend more than 30 minutes on each question.

SECTION A (COMPULSORY)

1. (a) Identify the labels of the biosensor below from **A to E.**   [10]
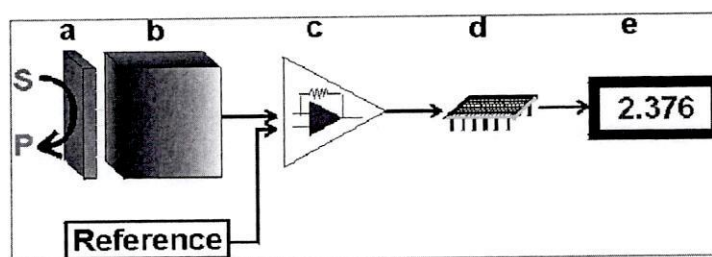

Figure 1: Illustration of the design of a biosensor.

(b) Explain the reasons behind the use of enzymes as biomarkers.   [10]

(c) Define the term biomarker and give **one** (1) example of an enzyme biomarker. [5]

SECTION B. Choose any THREE (3) from FIVE (5) questions below.

2. With the aid of a labeled diagram, describe the gene therapy technique.   [25]

3. Citing examples in your answer, explain how biotechnology is used in human medicine.   [25]

4. (a) Briefly outline how pharmacogenomic has assisted in tailor-made drugs. [15]
    (b) Write short notes on genetic diagnosis aiding human genome study. [10]

5. Explain how the field of proteomics has aided in cancer treatment. [25]

6. Describe the differences and similarities between molecular and cellular cloning. [25]

END OF EXAMINATION PAPER