Part B – Short Answer Questions (20 marks)

1.

1.1 Name the essential components used in Polymerase Chain Reaction (PCR) (03 marks)

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1.2 Give the roles of each of the component in a PCR mixture. (04 marks)

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1.3 List three (03) different types of PCR. (03 marks)

i.....

ii.....

iii.....

Index No.....

2.

2.1. Name four (04) factors that affect enzyme activation. (02 marks)

i.....

ii.....

iii.....

iv.....

2.2. Give three (03) advantages of using immobilized enzymes over free enzymes. (03 marks)

i.....

ii.....

iii.....

2.3. Name three (03) types of formed elements in blood and indicate one (01) function of each type of an element (05 marks)

i.....

ii.....

iii.....

Index No.....

Part C – 04 Structured Essay Questions- 60 marks

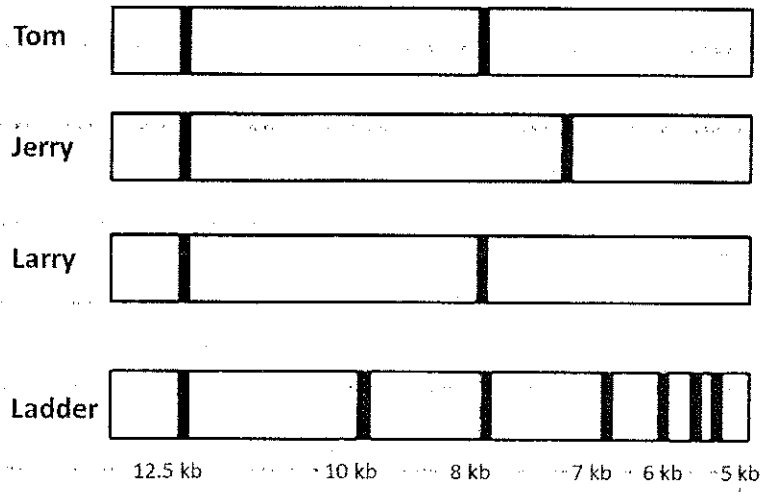
1.

1.1 State what is understood by the term "competent cells". (02 marks)

1.2 After completion of a transformation reaction, three possibilities of bacterial cells are possible in the reaction mixture. List these possibilities. (05 marks)

1.3 Indicate how researchers select the desired colonies from the pool of bacterial cells you mentioned in above in 1.2. (03 marks)

1.4 In a paternity conformation case, Tom wanted to know whether his biological father is Larry or Jerry. Following is a Restriction Fragment Length Polymorphism (RFLP) and Southern Blotting experiment, the fingerprint obtained in this case. Giving reasons justify who is the biological father of Tom. (05 marks)



2.

2.1. List essential steps in preparing a cDNA library. (03 marks)

2.2. Briefly explain how genomic library differs from a cDNA library. (04 marks)

2.3. How many clones you must screen to find your gene in a human genome (size 2.8 x 10^6 kb) library packaged in plasmid vector with a cloning limit of 20 kb with 99% certainty? Calculations should be shown clearly. (05 marks)

2.4. What is meant by a probe in molecular biology? (03 marks)

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3.

3.1. With a suitable diagram, briefly explain the antibody structure. (05 marks)

3.2. Name five (05) classes of antibodies and indicate one (01) specific function of each antibody type. (05 marks)

3.3. Name the pathways through which antibodies mediate the clearance and destruction of pathogens in the body. (03 marks)

3.4. Indicate the steps used in the generation of polyclonal antibodies. (02 marks)

4. .

4.1. What are the characteristics of antibiotics that qualify them as chemo-therapeutic agents? (03 marks)

4.2. List the criteria used in the classification of antibiotics based on the mode of action. (04 marks)

4.3. Explain the general procedure used in the manufacturing process of antibiotics. (08 marks)