BACHELOR OF MEDICAL LABORATORY SCIENCES (BMLS) HONOURS
MDU5407 – LABORATORY AUTOMATION AND INSTRUMENTATION
FINAL EXAMINATION

Part B: Structured Essay Questions (40 marks)

Question 01

State two (02) applications of each of the following techniques. (2.5 Marks * 4 = 10 Marks)

i. Southern blotting

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ii. Electrophoresis

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iii. Adsorption chromatography

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iv. Flame photometry

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Question 02

i. List two (02) types of auto analyzers depending on the working principle. (02 marks)

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ii. State two (02) advantages and two (02) disadvantages of an auto-analyzer. (02 Marks)

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iii. List four (04) factors you would consider in the expansion of existing automation in your laboratory. (04 marks)

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iv. State two (02) applications of dry chemistry analyzer. (02 Marks)

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Question 03

State one (01) cause and one (01) solution for the following incidences occurring in a medical laboratory. (2.5 Marks * 4 = 10 Marks)

i. The analyzer does not start.

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ii. The LCD screen is difficult to read.

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iii. The cuvette does not fit in the sample holder compartment of the wet chemistry analyzer.

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iv. The dry chemistry analyzer does not perform as expected.

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Question 04

i. List four (04) factors that affect the scattering of light in a spectrophotometric instrument.

(02 Marks)

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ii. Draw schematic diagrams of turbidometry and nephelometry instruments. (04 Marks)

iii. List two (02) applications of turbidometry. (02 Marks)

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iv. State the difference between photoluminescence and chemiluminescence. (02 Marks)

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Part C: Essay Questions (30 marks)

Question 01

A solution of guanosine showed an absorbance of 0.700 at 275 nm. If the path length of the cuvette is 1 cm, the molar absorptivity coefficient of guanosine is ϵ 275=8400$M^{-1cm-1\epsilon}$ and the maximum absorption wavelength of Guanosine is 275nm, calculate the concentration of the guanosine. Indicate and explain the law that you used in the calculation. (15 Marks)

Question 02

Briefly explain the importance of automation in hematology. (15 Marks)

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