GHANA COMMUNICATION TECHNOLOGY UNIVERSITY (GCTU)

2025 ACADEMIC YEAR

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

MID – SEMESTER EXAMINATION

COURSE CODE: ENCE 281

COURSE TITLE: CRITICAL THINKING AND LOGICAL REASONING

COURSE LEVEL: BCE L 100 (Group B)

SEMESTER 2

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Question 1

Inductive reasoning involves making general conclusions based on limited or specific observations. Unlike deductive logic, which guarantees certainty if the premises are true, inductive reasoning accepts a level of uncertainty—yet it's how we navigate most real-world issues.

The quote implies that life demands decisions even when evidence is incomplete. In the case of Ghana's E-Levy cancellation, inductive reasoning has been central to public and political reactions. Let's break this down:

When the E-Levy was introduced, Ghanaians observed:

An immediate drop in mobile money transactions.

Widespread complaints about double taxation.

Public dissatisfaction and protests.

Revenue collection from the levy failing to meet targets.

These observations became premises. From them, many concluded that:

The E-Levy was a failure.

It hurt digital financial inclusion.

It was more of a political misstep than an economic solution.

Yet, these are insufficient premises—they're limited in scope, driven by short-term effects, anecdotal reactions, and partially released data. But they were "sufficient" enough for the public and even government actors to push for cancellation.

This is classic inductive reasoning: generalizing from patterns without absolute proof. The same process was used to predict that its removal might revive digital transactions—again, without full certainty.

Thus, the cancellation and the public reaction to it are examples of trying to "draw sufficient conclusions from insufficient premises." In the absence of complete economic modeling or long-term data, both citizens and leaders relied on pattern recognition, assumptions, and cause-effect reasoning to justify ending the policy.

Question 4

Democracy – A form of government (genus) in which power rests with the people through elected representatives (difference).

Laptop – A computer (genus) designed for portable use (difference).

Bank – A financial institution (genus) that receives deposits and issues loans (difference).

Student – A person (genus) actively engaged in learning or enrolled in an educational institution (difference).

Justice – A concept (genus) involving fair treatment and impartial application of rules (difference).

Teacher – A person (genus) who imparts knowledge or facilitates learning (difference).

Smartphone – A mobile device (genus) with advanced features like internet access and app functionality (difference).

Hospital – A healthcare facility (genus) for treating and diagnosing illnesses with professional staff and equipment (difference).

Law – A system of rules (genus) enforced by authority to regulate behavior (difference).

Corruption – A behavioral act (genus) involving abuse of power for personal gain (difference).

b) Use the following statements to demonstrate contrary, contradictory, subalternation, and subcontrary relationships:
Statements:

i. Some Ghanaians are supporters of NDC (Particular Affirmative).

ii. All Ghanaians are supporters of NDC (Universal Affirmative).

iii. No Ghanaians are supporters of NDC (Universal Negative).

iv. Some Ghanaians are not supporters of NDC (Particular Negative).

Contraries:

Statement ii vs iii (All vs None): Cannot both be true, but both can be false.

Contradictories:

Statement ii vs iv (All vs Some Not): One must be true, the other false.

Statement i vs iii (Some vs None): One must be true, the other false.

Subalternation:

From ii (All) to i (Some): If "All" is true, then "Some" is necessarily true.

From iii (None) to iv (Some Not): If "None" is true, then "Some Not" is also true.

Subcontraries:

Statement i vs iv (Some vs Some Not): Cannot both be false, but both can be true.

c) For each statement, determine the converse, obversion, and contraposition and assess logical equivalence:

i. Some Ghanaians are supporters of NDC

Converse: Some NDC supporters are Ghanaians

Obversion: Some Ghanaians are not non-supporters of NDC

Contraposition: Not applicable for "Some"

ii. All Ghanaians are supporters of NDC

Converse: All NDC supporters are Ghanaians

Obversion: All Ghanaians are not non-supporters of NDC

Contraposition: All non-supporters of NDC are non-Ghanaians

iii. No Ghanaians are supporters of NDC

Converse: No NDC supporters are Ghanaians

Obversion: All Ghanaians are not supporters of NDC

Contraposition: All supporters of NDC are non-Ghanaians

iv. Some Ghanaians are not supporters of NDC

Converse: Some non-supporters of NDC are Ghanaians

Obversion: Some Ghanaians are not supporters of NDC

Contraposition: Not always valid for "Some" statements