Faculty:	FACULTY OF ELECTRICAL ENGINEERING		
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UTM UNIVERSITI TEKNOLOGI MALAYSIA FACULTY OF ELECTRICAL ENGINEERING

BASIC POWER LABORATORY

STUDENT PACK
Transformer Feasibility Study

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Problem:

One of 132/33 kV 3 phase transformer exploded at H2H Pte Ltd Factory Substation. Initially, they are two transformers that put in parallel to supply large H2H Factory. The explosion had caused one transformer permanently damage while another transformer requires a minor repair. However, the nameplates for both transformers are missing. As an electrical consultant that assign by H2H Company, your team require to state the correct design of the transformer that can be paralleled with the existing transformer.

[Based on last record, the transformer input and output voltages are $132\angle 0° kV$ and $33\angle 150° kV$, respectively.]

1.	**Problem / Project Guide:**

Students are expected to read and understand materials related to transformer of power system network. Furthermore, students are also required to explore in the basic design of transformer winding.

Questions That Can Help You Tackle the Problem

1. How transformer winding is design?
2. What are the important parameters for parallel/synchronizing both transformers?

The students have to accomplish their task within three weeks' time. As guide, students may follow the problem solving time-line as given in table below.

(a) **Problem-solving Time-line**

Activities	Week 1	Week 2	Week 3
1. Understand/Identify/Brainstorming			
2. Design/Modeling/ Testing/Measurement			
3. Experiments/Report Writing			

Assessment criteria are standardized for all laboratories and will generally be the same for all laboratories. For further understanding about the assessment criteria, please refer to PBL Third-year Laboratory Assessment document.

Report Writing

Other than the *general guide* specified by the Laboratory Coordinator, the report must include:

- Experimental Procedures
- Experimental Data
- Photographs of the actual circuit construction
- Circuit diagram
- Photographs of your group members

Part of the student assessment will include reporting of their weekly activities and the log book.

2.	**Equipments list:**

Transformer Test Set
415V Power Supply
Data Acquisition and Control Interface

3.	**Component list:**

Connector cables, multimeters, laptop

4.	**Software**

Matlab

5.	**Additional Resources**

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6.	**References**

1. Heathcote, Martin. *J & P transformer book*. Elsevier, 2011.
2. Kulkarni, Satish V., and Shrikrishna A. Khaparde. *Transformer engineering: design, technology, and diagnostics*. CRC press, 2017.