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| **Title of the Exercise:** To operate two transformers in parallel and find their load sharing |
| **Date:** |
| **Aim: To operate two transformers in parallel and find their load sharing** |
| **Tool used : MATLAB** |
| **Electrical Circuit:**  Graphical user interface, application, Teams  Description automatically generated  **Parameters used for the study**  Transformer rating = 50KVA  V1=2400V (primary voltage in Rms)  V2=240V (Secondary voltage in Rms)  Frequency f=50 Hz  **D:\PDF\Sem 3\DC Machines Lab\Week 9\transformer values.JPG** |
| **Theoretical Analysis**  Calculate the values of IAC and IBC by given formulae  ≃ & ≃  Equivalent impedence of Transformer 1 referred to secondary side.  Equivalent impedence of Transformer 2 referred to secondary side. |
| **Calculations:**  **1st Transformer(K=0.1)**  R1=0.788ohm  R1’= 78.88ohm(R1’ = R1/K2)  Similarly  X11=1.0024ohm  X1’=100.224ohm  R2=0.00748ohm  X12=0.010028  **2nd Transformer(K=1/10)**  R1=1.3ohm  R1’=130ohm(R1’ = R1/K2)  Similarly  X11=3 ohm  X1’=300 ohm  R2=0.002 ohm  X12=0.03  Za= {(0.007488+74.88)2 +(0.010024+100.224) 2}1/2 = 125.12ohm  Zb= {(130+0.02)2 +(300+0.03) 2}1/2 = 326.984ohm |
| **Procedure for simulation study**  • Write the coding for initializing the input parameters and as per requirement of plots in m file and save it.  • Open new Simulink file and make mathematical modelling as per circuit diagram and save it.  • Run the m file first, after that run Simulink file.  • View the result in Scope.  • Again, run m file and view the plots.  • Make various plots and write the results. |
| **Simulation Diagram**  Diagram  Description automatically generated |
| **Results and Discussions**   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **S.No.** | **Vload** | **Iload** | **Ia** | **Ib** | **Iac** | **Ibc** | **ZL**   |  |  | | --- | --- | | **RL** | **LL** | | | 1 | 127.3 | 121.4 | 88.29 | 33.82 | 87.80 | 33.597 | |  |  | | --- | --- | | 1 | 0.001 | | | 2 | 209.8 | 41.88 | 30.47 | 11.65 | 30.29 | 11.59 | |  |  | | --- | --- | | 5 | 0.001 | | | 3 | 233.1 | 7.426 | 5.402 | 2.07 | 5.371 | 2.055 | |  |  | | --- | --- | | 20 | 0.1 | | | 4 | 239 | 0.7637 | 0.5562 | 0.2173 | 0.552 | 0.2113 | |  |  | | --- | --- | | 5 | 1 | | | 5 | 240.1 | 0.2551 | 0.1872 | 0.0771 | 0.1845 | 0.0706 | |  |  | | --- | --- | | 20 | 3 | | |
| **Comparisions**  In case 2   * 41.88\*326.984/(125.12+326.984)=30.29A * 41.88\*125.12/(125.12+326.984)=11.59A   Hence:  ≃ & ≃ |
| **Conclusion**  Parallel operation of transformers and their load sharing is done successfully. |
| **Inference**  ≃ & ≃  Is achieved successfully. |
| **References**  NIL |