Electrical quiz 7
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Contribution by: C.Kaliaperumal/Former Chief Engineer/TNEB/India

24. Which type of winding is used in both core and shell-type transformer?

In core type, concentric and inter leaved type of windings are used. In concentric, as both windings are placed on same side, the flow of currents in windings should be in opposite direction as per Lenz Law. The low voltage windings are placed near the core, to reduce the insulation withstand voltage near the core. In inter leaved type, half of each winding is placed on a limb.
In shell type sand-witched type, windings are used to decrease the leakage flux. Grading of insulation is done as descending order of priority.

25. How is the Back to Back test on transformers conducted?
Back to Back test or *Sumpner test*is a factory test done on two transformers on full load to find out the full load loss and their heat run ability without actually loading.The LV side of the two transformers are connected in parallel with each other and connected to variable supply voltage. The HV side of the two transformers are connected in series so that the voltage across them is equal and opposite simulating a zero voltage condition and a variable voltage source is connected. Now, rated voltage is applied in the LV side with the variac supplying to HV side is set on zero. At this condition both the transformers are working at Open Circuit condition and wattmeter reading reads the sum of core losses of both Transformers. Now, gradually the variac setting of the HV side is increased till the rated HV current and the wattmeter reads the sum of copper loss of both Transformers. Also, both Transformers are checked for heat run test simultaneously without actually loading them. The transformers are kept in this condition for 48 hours and temperature is noted on hourly basis till it maintains constant temperature and should be within the limit.

26. Why is a circular core not preferred in a transformer?
Although circular cross section of core would be compatible with circular windings, it is highly inconvenient because laminations of different sizes are to be stacked. In a rectangular cross section core, laminations are of the same size could be easily arranged.Moreover mechanical strength of the core falls, when riveting the circular laminations, which is why rectangular core is universally adopted.

27. What is the cause of saturation in transformers?
Saturation of transformer is mainly based on type of material used in core. Every material has the limit above which increase in magnetic field strength (H in Ampere Turn/m) will not increase the flux density (B in Tesla) in the magnetic material which can be known from the B-H curve of the particular material. Saturation of magnetic core is exceeding their capability and no longer respond linearly with magnetic flux to increases in primary current. The secondary therefore no longer follows the primary, basically it holds. Generally, core saturation depends upon the Voltage to frequency ratio which should be always maintained constant. On the other hand ,if voltage is higher than the equipment rated voltage, it will draw more magnetising current that simply means higher value of H and will cause saturation.

28. What happens when a transformer is saturated?
The flux control is lost, current increases, heats up and if allowed to continue, rapidly builds up temperature making the windings very hot and causing the enamel insulation to fail, shorting out the transformer and causing major hazards leading to transformer failure.

29. what are active and passive electrical components?
Activecomponents:
Those components which require external source to their operation is called active Components. For Example: Diodes, Transistors, SCR etc.
The Diode will not conduct the current until the supply voltage reach to 0.3(In case of Germanium) or 0.7V(In case of Silicon) and SCR require **triggering voltage to conduct.**
Passive Components:
Those components which do not require any external source for their operation are called Passive Components.
For Eg: Resistor, Capacitor, Inductor, & transformers.

30. Why one of the secondary terminals of the Instrument transformers are grounded?
a.The unlike polarity terminal of the CT and neutral of the PT is grounded to avoid voltages due to capacitive coupling between the CT secondary and the line being monitored (CT Primary) and also for PT.
b.Instrument transformer's secondary reference terminal grounded as protection against electrostatic voltages or insulation failure.