Electrical quiz 10

42.What will be the primary and secondary current of a transformer?
a. Seconday current of a transformer is only the actual load current.
b. The primary current will be the sum of the magnetising currents of both windings and the current which counter balances the demagnetising effect of the secondary load current.

43.What are the ACSR conductors used for 11 & 22 kV and LT conductors?
ACSR,7/4.09 mm for HT.
ACSR,7/3.35 mm for HT.
ACSR,7/2.29 mm for LT lines.

44. What is the maximum length allowable for HT distribution and LT lines?
10 kM for HT lines subject to regulation limit of +/-6%
3 kM for LT lines subject to regulation limit of +/- 6%

45. What is a three phase circuit?
A combination of three circuits energised by alternating electro motive forces which differ in phase by one third of a cycle ,i.e,120 degree for transfer of optimum power.

46. Why is three phase preferred and not other numbers?
Basically any number of phases are possible but in case of "even" number phases like 2, 4, 6...., will have have equal angle in them (180,90,60 deg ....)and as such a pair of phases in such system will always be in opposite direction to each other resulting higher neutral current.Whereas, in a 3 phase power system, none of the phases are in phase opposition resulting very small neutral current.Also, 5,7,9...   odd ones are possible , but uneconomical due to number of conductors(6,8,10 nos.) and hence the material involved will be higher. Hence, the optimum required phases is only three.

Also,the 120 degree offset of the three waveforms that provides a smoother continuous transfer of power without any time difference and hence only with a little bit voltage ripple.Also, 3 phases provide power throughout the cycle (i.e. there is no point of time when there would not be voltage

difference between phases to provide power.

47. What are the values of Form factor,Crest factor of sine waves?
Form factor:
It is the ratio of the root mean square (RMS) value to the average value of an alternating quantity (current or voltage) and is equal to 1.11.
Crest or Peak Factor:
It is the ratio of maximum value to the R.M.S value of an alternating quantity and is equal to 1.414(root 2).

48.Define Load Factor,Diversity Factor and Plant Load Factor.
a.Load Factor/
Demand factor/ Max.Utilization factor :
The ratio of the maximum coincident demand or load of a system, or part of a system, to the total connected load of the system is load or demand factor and usually less than one.Depends upon the nature of load,viz,domestic,commercial,industry,hospitals,educational institutions,etc. Lower the load factor, less the system capacity required to serve the connected load.
b. Diversity Factor
DF is defined as the ratio of the sum of the maximum demands of the various part of a system to the coincident maximum demand of the whole system. The maximum demands of the individual consumers of a group do not occur simultaneously.
i.e),DF:Max demand of the subdivision system/
Max demand of the whole system.
Shall be more than 1.00.
c.Plant Load Factor
It is a measure of the output of a power plant compared to the actual output to that of it can maximum generate.
PLF: Actual energy generated /Maximum possible energy that can be generated.

49. What is the electrical tension?

Electro Motive Force or Potential Difference is referred as electrical tension.

50. What do you mean by phase difference?

The time difference of any two electrical quantities of the same frequency at any instant is the phase difference between the two .
First quantity to reach the maximum value is said to be in lead with it's lagging quantity.

51. What is the conventional direction of any vector diagram?
Counter clockwise.

52. How many vector groups in transformer windings connection and based on which parameter?
Three groups based on angular displacement between the primary and secondary windings with Zero or 30 or 180 degree.

53.Define Peak Value, Average Value and RMS Value of a sine wave?
Peak/Crest/ Max Value:
The maximum value attained by an alternating quantity during one cycle is called its Peak value at 90 degrees.
Em ,Im:1.414 Erms,
1.414 I rms.
Average Value:
The average or mean value of a sine wave
(symmetrical alternating quantity) is the average value measured over only one half of a cycle, since, the average value over one complete cycle is zero regardless of the peak amplitude.
The average value of a sine wave of voltage or current is 0.637 times the peak value, (Vm or Im).i.e,(2/3.14)Vm.
The average voltage value of 230 V (rms) is 207 volts.

RMS Value:
It is square root of the average of instantaneous voltage or current values of the AC.Irms =0.707(Imax).