QP Code : 15282

(3 Hours)   [Total Marks : 100

N.B :   (1) Question no. **1** is **compulsory**.
        (2) Attempt any **four** from out of remaining **six** questions.
        (3) Assume suitable data if necessary and justify the same.

1.   Answer the following questions :—
        (a) Explain any five types if enclosers of three phase induction motor.   5
        (b) List various assumptions made for calculations of leakage reactance in case   5
            of transformer.
        (c) Explain various types of insulating materials location in machine.   5
        (d) Write about choice of flux density for designing of transformer.   5

2. (a) Derive an output equation of single phase and three phase transformer.   10
    (b) A 315 KVA, 6600/440 volts, 50hz, 3 phase core type transformer has the following   10
        design data :-
            -   Maximum flure density   =   1.3 wb/m^2
            -   Emf per turn   =   15 volts
            -   Stacking factor   =   0.9
            -   Window space factor   =   0.3
            -   Current density   =   3A/mm^2
            -   Overall width   =   Overall height
            -   Use three stepped core.
        Calculate the over all diemnsions.

3. (a) Derive the output equation of induction motor.   10
    (b) Extimate the stator core dimensions, number of stator slots and number of stator   10
        conductors per slot for a 100kw, 3.3kv, 50Hz, 12 pole star connected slip ring
        induction motor. Assume :-
            -   Average gap density   =   0.4 wb/m^2
            -   Conductors per meter   =   25,000 A/m
            -   Efficiency   =   0.9
            -   Power factor   =   0.9
            -   Winding factor   =   0.96
        Choose main dimension to give best power factor. The slot loading should not
        exceed 500 ampere conductors.

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LM-Con.:6947-14.

4. (a) Explain different methods of cooling of transformer with neat sketches. **10**

   (b) A single phase, 230 volts, 50Hz, transformer is built from stampings having a relative permeability of 1000. The length of the flux path is 2 meter, the area of cross-section of the core is $2 \times 10^{-3} m^2$ and the primary winding has 575 turns. Extimate the maximum flux and no load current of the transformer. The iron loss at the working flux density is 2.6 w/kg. Iron density 7.8×10^3 kg/m³, Stacking factor = 0.9. **10**

5. (a) Explain the factors affecting the length of air gap in designing of induction motor. **10**

   (b) What are the different parts of magnetic circuit of three phase induction motor? Estimate the total magnecising mmf of a induction motor and derive an expression for magnetizing current in terms of mmf. **10**

6. (a) Explain various types of leakage fluxes in induction motor with neat diagrams. **10**

   (b) Explain Designing aspects of EEM interms of stator, rotor and air gap. **10**

7. (a) Compare between **10**
      (i) Cold rolled steel sheets and Hot rolled steel sheets.
      (ii) Copper and aluminium.

   (b) What is dispersion coefficient and explain its effect on maximum power factor of induction motor. **10**