MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : PE-EE 601C/PE-EEE 601B Electrical Machine Design

UPID : 006612

Time Allotted : 3 Hours *Full Marks :70*

The Figures in the margin indicate full marks.
Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer *any ten* of the following : [1 x 10 = 10]

(I) How is a synchronous motor excited ?

(II) How is the maximum allowable load on machine determined ?

(III) Which Viscosity of transformer oil permits rapid circulation of oil?

(IV) Which type of winding is used for balance loading of three phrase transformer?

(V) How is over load capacity of induction motor calculated?

(VI) What is the function of damper winding?

(VII) Why vibration and noise happen in 3 phrase induction motor ?

(VIII) Which type of material is generally used in electro magnet ?

(IX) Where disc and contineous disk winding are used ?

(X) What is the value of flux density in the stator core ?

(XI) What is the nature of power factor when armature reaction cross magnetizes ?

(XII) Which type of power is control by synchronous compensator`?

Group-B (Short Answer Type Question)

Answer *any three* of the following : [5 x 3 = 15]

2. What is the difference between magnetic circuit and thermal circuit? What are the factors that limit the design of a machine ? [5]
3. What are the electrical properties of transformer oil? [5]
4. What is positive tapping and negative tapping ? [5]
5. How area of stator slot of Induction motor is cxalculated ? [5]
6. What are the effect of short circuit ratio on machine performance? [5]

Group-C (Long Answer Type Question)

Answer *any three* of the following : [15 x 3 = 45]

7. (a) How can tooth pulsation loss be minimized in case of induction motor ? [5]
   (b) Which factor should be considered when estimating the length of air gap of induction motor ? [5]
   (c) Why integral slot winding are used in induction motor ? [5]
8. (a) How is specific magnetic loading determined ? Explain. [5]
   (b) What is thermal resistance ? Explain [5]
   (c) What is ambient temperature ? Explain [5]
9. (a) What is surge phenomenon of transformer ? [5]
   (b) What is leakage reactance of winding ? [5]
   (c) What are the parameters that change with change of frequency of transformer? [5]
10. (a) Why brush carbon are often graphited? [5]
    (b) Why the value of flux density is limited by current density in conductor? [5]
    (c) What is leakage flux and leakage co-efficient ? [5]
11. (a) Discuss in short about industrial generator (Synchronous machine). [5]
    (b) Classify the various losses in synchronous machine . [5]
    (c) Discuss in short about Short ckt characteristics of three phase synchronous machine . [5]

*** END OF PAPER ***