C09-EE-**402**

3474

BOARD DIPLOMA EXAMINATION, (C-09)

MARCH / APRIL - 2019

DEEE - IV SEMESTER EXAMINATION

A.C. MACHINES - I

Time : **3** Hours] [Total Marks : **80**

PART - A **3×10=30**

Instructions : *(1) Answer **ALL** questions.*
*(2) Each question carries **THREE** marks.*
(3) Answer should be brief and straight to the point.

1 Write the differences between core type and shell type transformers.

2 Define all day efficiency of a distribution transformer.

3 Draw the circuit diagram for conducting SC test on a single phase transformer.

4 State any three advantages of 3-phase transformer over bank of three single phase transformers.

5 Mention any three applications of instrument transformers.

6 State the advantages of an Auto transformer.

7 Define :

(a) Synchronous reactance

(b) Synchronous impedance of an Alternator

8 Write any three advantages of stationary armature over rotating armature.

9 Define voltage regulation of an alternator.

10 Write the conditions for operating alternators in parallel.

PART - B 10×5=50

Instructions : *(1) Answer any **FIVE** questions.*
*(2) Each question carries **TEN** marks.*
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11 Describe Sumpner's test (Back to Back Test) on a single phase transformer.

12 (a) Explain the working of transformer.

(b) Various losses in a transformer.

13 Two single phase trnsformers with an equal voltage ratio are running in a parallel and supplying a load of 100kW at 0.8 p.f. lag. The equivalent impedances of the transformers are referred to secondary are $(0.5 + j3)\ \Omega$ and $(0.6 + j10)\ \Omega$. find the load shared by each transformer.

14 (a) Derive E.M.F. equation of single phase transformer.

(b) A single phase 600/230 V, 50 HZ transformer has a core area of 400 cm^2 and a maximum flux density of 1.18 wb/m^2, calculate the number of turns in primary and secondary windings.

15 (a) Briefly explain the oil natural air forced cooling of Power Transformer with a neat sketch.

(b) Briefly explain the oil forced air forced cooling of Power Transformer with a neat sketch.

16 Explain the constructional details of an alternator.

17 A 3 phase, 16 Pole Alternator has 144 slots with 4 conductors per slot, the winding being double layer winding. Flux in the air gap is 50 mwb, sinusoidally distributed. The coil span is 150^o (Electrical). Find the EMF generated when the Alternator shaft is driven at 375 rpm.

18 Two alternators working in parallel supply at the following loads :

Lighting Load of 500 KW

1000 KW at P.F. of 0.9 Lagging

800 KW at P.F. of 0.8 Lagging and

500 KW at P.F. of 0.9 Leading

One alternator is supplying 1500 KW at 0.95 PF Lagging. Calculate the KW output and power factor of the other machine.
