22418

12223

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answer with neat sketches wherever necessary.

(4) Assume suitable data, if necessary.

(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) State the function of field winding in an electric motor.

b) State Fleming's left hands rule.

c) Classify transformers based on:

i) Construction

ii) Voltage level

d) Write any two characteristics of core type transformer.

e) Differentiate between bank of three single phase transformers and single unit of three phase transformer on any two parameters.

f) Write down any two applications of single phase auto transformer.

g) State any one advantage and any one disadvantage of potential transformer.

Marks

2. Attempt any THREE of the following: **12**

a) Draw a neat schematic diagram of all types of D.C machine.

b) Give one function and the material used for the following parts of D.C motor:–

i) Yoke

ii) Pole shoe

iii) Armature winding

iv) Brush

c) State and explain the significance of back e.m.f in D.C motor.

d) With the help of neat diagram, explain the construction of BLDC.

3. Attempt any THREE of the following: **12**

a) With the help of neat circuit diagram, describe the procedure to vary the speed of D.C shunt motor above normal speed.

b) Draw neat diagram for Equivalent circuit of transformer.

c) A single phase transformer has 1000 turns on primary and 200 turns on secondary. Calculate the primary current when secondary current is 280 ampere at a p.f of 0.8 lag.

d) A 30KVA, 2400/120V, 50HZ, single phase transformer HV winding resistance 0.1 ohm and leakage reactance 0.22 ohm. The LV winding resistance is 0.035 ohm and reactance 0.012 ohm. Find equivalent resistance reactance and impedance referred to HV side.

Marks

4. Attempt any THREE of the following: **12**

a) Draw a neat winding connection of Delta Delta for three phase transformers. Also give any two advantages of the same.

b) Draw a neat connection diagram of open delta three phase transformer and give any two disadvantages of this connection.

c) Compare power transformer and distribution transformer on the following parameters :–

i) Typical Voltages

ii) Power rating

iii) Maximum efficiency

iv) Type of efficiency

d) A 10KVA, single, phase 500/250 V transformer gave following test results :–

O.C. test : 250 V, 3A, 200 W (HV open)

S.C. test : 25V, 20A, 300 W (LV shorted)

Calculate efficiency and regulation at full load, 0.8 p.f lagging.

e) Why secondary of a CT should never be kept open? Explain the reason in detail.

5. Attempt any TWO of the following: **12**

a) Draw a neat labelled diagram of three point starter and state the function of no volt coil present in it.

b) State the necessity of phasing out test on a three phase transformer and describe its procedure with the help of neat diagram.

c) Explain need of parallel operation of transformer.

Marks

6. Attempt any TWO of the following: **12**

a) Draw the circuit diagram to conduct O.C. and S.C. test on a 1 KVA, 230/115 V, 50 Hz, single phase transformer. Justify the meter ranges also.

b) Discuss in detail any four cooling methods of three phase transformer.

c) i) Define all day efficiency

ii) A 10 KVA transformer has a full load efficiency of 96 percentage. The copper and iron losses at full load are equal. Loading schedule of the transformer during a day is given below. Calculate the all day efficiency.

Loading	No load	Full load	Half load	Quarter load
Number of hours	10	2	5	7