22418

23124

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 answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) 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) List the different parts of D.C. machine.

b) State the working principle of DC motor.

c) How many % frictional losses occurs in transformer.

d) Why transformer is rated in KVA instead of KW ?

e) Draw neat labeled diagram of phasing out test carried on 3 phase transformer.

f) State the use of current transformer.

g) Compare two winding transformer with auto transformer on any four points.

Marks

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

a) Explain construction and working principle of 3 phase induction motor with neat diagram.

b) Draw neat labeled diagram showing constructional parts of DC machine.

c) List different speed control methods of DC series motor. Explain any one of them.

d) A 220 V SC shunt motor runs at a speed of 850 rpm and takes current of 20 A from mains. Calculate the speed if the torque is doubled. Armature resistance is 0.2 Ω.

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

a) Explain construction and working principle of BLDC motor.

b) Derive EMF equation of transformer.

c) Draw equivalent circuit diagram of 1 phase transformer referred to secondary side. State the meaning of each term related to equivalent circuit.

d) The efficiency of a 100 KVA, 11000 / 440 V, 1Ø transformer is 87% on half load at 0.8 (lag) and 89% on full load at unity p.f. Determine iron and copper losses.

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

a) Explain with the neat diagram Scott connection scheme for conversion of 3Ø to 2Ø supply.

b) Compare distribution transformer and power transformer on any four points.

c) Give any four selection criterion for

i) Distribution transformer.

ii) Power transformer

d) A 3300/230V, 50Hz single phase transformer is to be operated at a maximum flux density of 1.2 Wb/m^2 in the core. The effective cross sectional area of the transformer is 150 cm^2. Calculate suitable values of primary and secondary turns.

e) Explain with circuit diagram use of potential transformer to measure 33 KV.

Marks

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

a) A 4 pole generator having wave wound armature winding has 51 slot each slot containing 20 conductors. What will be the voltage generated in machine when driven at 1500 rpm assuming flux per pole to be 7 mWb ?

b) Explain construction and working of isolation transformer.

c) i) State the need of parallel operation of transformer.

ii) State the conditions for parallel operation of transformer.

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

a) A 500 KVA, distribution transformer having copper and iron losses of 5 KW and 3 KW respectively on full load, The transformer is loaded as shown below.

Loading (KW)	Power Factor (lag)	No. of hrs.
400	0.8	08
300	0.75	10
200	0.8	03
No load	—	03

Calculate all day efficiency.

b) Identify the parts shown in the diagram of a transformer in Fig. No. 1.

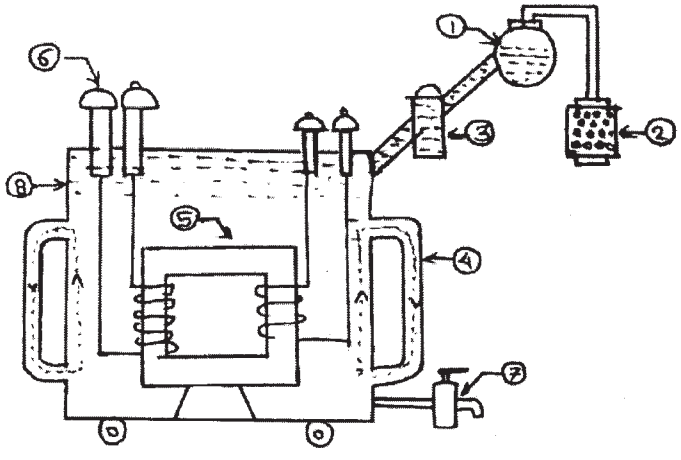

Fig. No. 1.

c) List the special features of welding transformer.