

Certificate

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Class:

Roll No: F21030002020

Exam No: 4th Sem

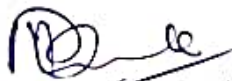
Institution SCITM

This is certified to be the bonafide work of the student in the
EC-I Laboratory during the academic
year 2022/2023.

No. of practicals certified 8 out of 10 in the
subject of EC-I



Teacher In-charge



Examiner's Signature

Principal

Date: 12.14.2023

Institution Rubber Stamp

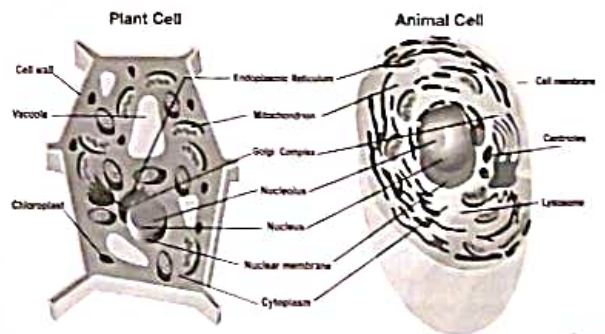
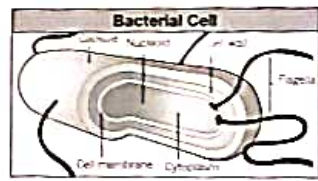
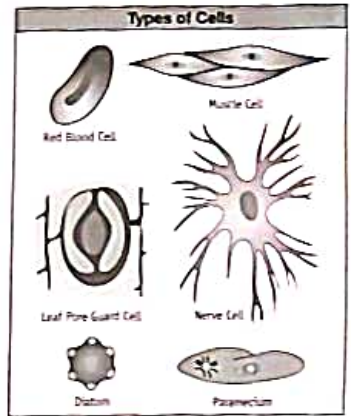
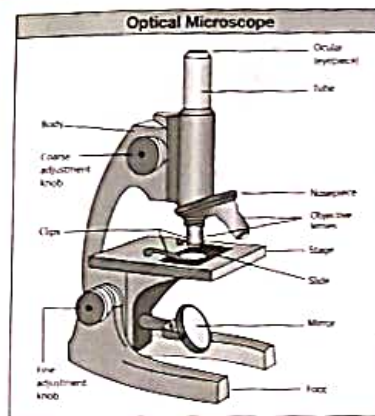
(N.B: The candidate is expected to retain his/her journal till he/she passes in the subject.)

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3.	To perform the DC SSC test of 1- ϕ phase transformer to find out the parameters of equivalent circuit.	10-22	28.2.23	7.3.23	(4) AD 8.3.23
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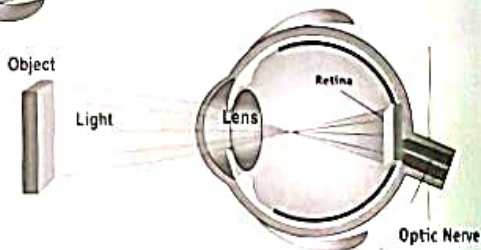
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7.	To perform no load and characteristics of a DC shunt generator.	54-56	28.3.23	4.4.23	(5) ADK 5.4.23
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38 + 9 (VIVA VOCE) = 47 ADK					

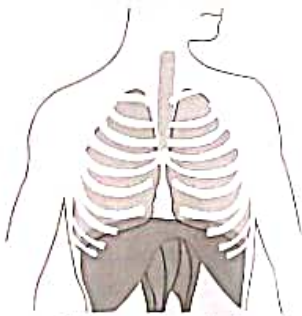


Source : Internet

THE EYE & HOW THE EYE SEES

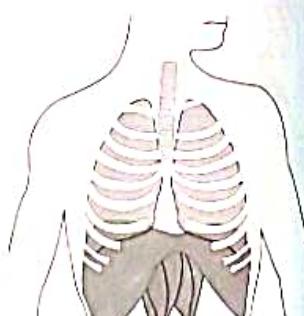


BREATHING IN



Diaphragm contracts and pulls downward, drawing air into the lungs

BREATHING OUT



Diaphragm relaxes and moves upward, pushing air out of the lungs

Date _____

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AIM OF THE EXPERIMENT:

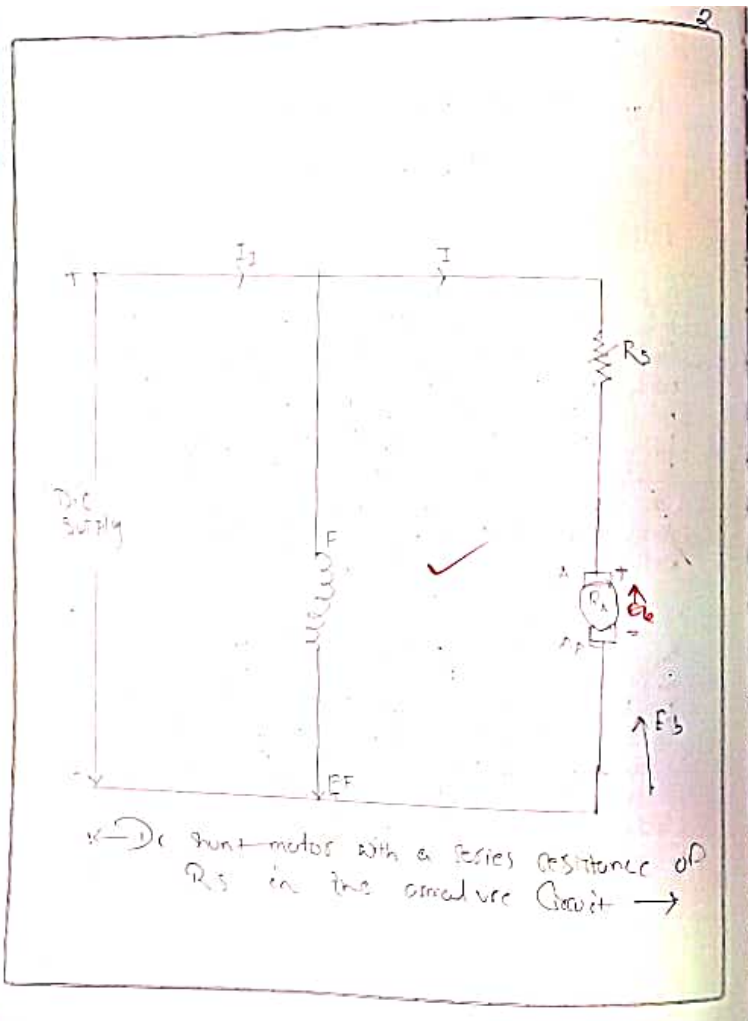
Study of a d.c. Shunt motor started.

THEORY

If a d.c. motor, which is at rest is connected to its rated supply it draws a very large current. This is because the current in its armature circuit is limited by its normally small. This current is usually many times more than the rated current of machine and is dangerous to armature circuit as well as the supply cable. So at the time of starting a d.c. motor the current in the armature circuit has to be limited to a safe value. This can be achieved by connecting a suitable starting resistance (R_s) in series with the armature, as shown in fig.

D.C. Shunt motor with a series resistance of R_s in the armature circuit with suitable starting resistance (R_s) in armature circuit the armature current at the time of starting is limited by total resistance ($R_a + R_s$) and is safe. After the motor starts a generated voltage appears across armature terminals. This voltage is proportional to the speed of the field is \propto constant and.

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Date _____
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it is in opposition to the applied voltage. This is known as back EMF. Because of this voltage, the current in the armature circuit reduces and is given by the expression.

$$I_a = \frac{V - E_b}{R_s + R_a}$$

where V is the d.c. voltage applied and E_b is back EMF. This back EMF is proportional to the speed of motor with increase in speed, there is an increase in speed, there is an increase in speed, there is an increase in speed and because of this there is a reduction of armature current. The final speed which the motor attains is such that the armature current (I_a) develops a torque which is just able to make the motor at that particular speed against the load and no further acceleration is possible. After this speed is reached the resistance R_s can be gradually reduced to zero bringing the motor to its normal running condition. (A three-point starter for a shunt motor works on the above mentioned principle and in Corcoran's additional features such as protection against 'overload' and 'no-volt'. A three-point starter (as shown in fig) has three terminals L.A. and F. terminals. It is connected to the positive terminal of supply line. A to motor and F to shunt field.

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It consists of a handle which is provided with a soft iron piece and a strong spring. This handle when moved against the force of spring makes contact with the brushes and with studs connected to the starting resistance. Brush arm is connected to the terminal F_1 in series with a coil known as 'no volt release'. The starting resistance (R_s) is connected in series with the armature. This coil is connected in series with a no volt release coil as shown in fig. For starting the motor the starter handle is moved to the first stud of the position the current drawn by short field is normal and the starting current drawn by the armature is

$$I_a = \frac{V}{R_a + R_s}$$

(No. 7 R_s)

This is known as 'ON' position, when this current becomes greater than the predetermined value the magnetic force becomes sufficient to attract a soft iron piece 'S' which goes to the 'OFF' position and stops the motor.

(4)
22-2-23

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AIM OF THE EXPERIMENT

To determine the D.C and A.C. loss of I- ϕ transformer to find out the parameters of equivalent circuit.

Machine specification

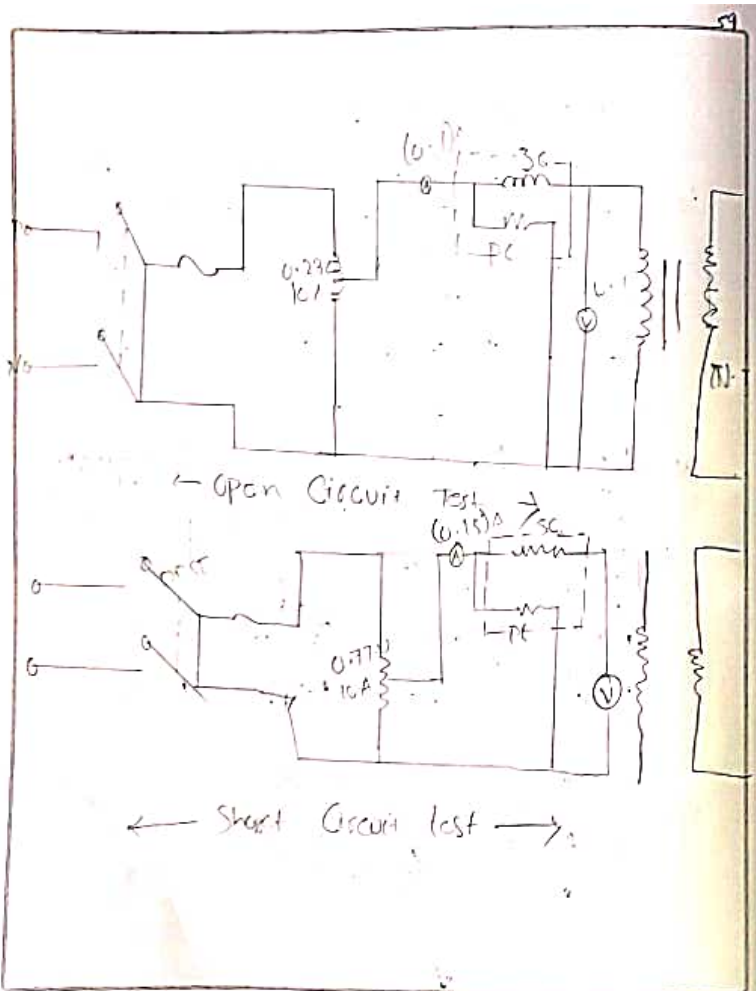
Transformer $I_p = 315 \text{ A}$, $V = 230 \text{ V}$, 50 Hz

Apparatus Required -

Sr. No.	ITEM	TYPE	SPECIFICATION	QUANTITY
1	Variable	I- ϕ	0-270V-20A	1
2	voltmeter	mV	(0-150) mV	1
3	voltmeter	mV	(0-50) V	1
4	Ammeter	mI	(0-1) A	1
5	Ammeter	mI	(0-15) A	1
6	wattmeter	Wattmeter	(0-150) W	1
7	wattmeter	Dynamometer	150V-1.2A	1
8	connecting wires/ flexible		1.5mm ²	AS required.

THEORY:

To find and the voltage regulation and efficiency the equivalent circuit - diagram is must essential. So the parameters of equivalent CKT are required to draw the equivalent CKT diagram of I- ϕ transformer.



Which can be found from the DC and SC test for or test the L-V side is used as primary for easy measurement and control also.

Cose loss (pc) = w

Volp (ospo) = w_1

cos ϕ_0 = $w_1 / V_0 I_0$

Cons loss component of no load current

IC = $I_0 \cos \phi_0$

30

RC = $V_1 I_2 \cos \phi$

WSC = $Cu I^2 R$

WSC II SC cos ϕ SC = WSC

cos ϕ SC = $WSC / VSC I_{SC}$

PROCEDURE

- 1) Connect the wires as per the (ii) diagram.
- 2) Now ~~Start~~ rotate the Dial and observe the various full scale voltage.
- 3) Now bring the variac to zero position and switch off the supply.
- 4) Take the reading clearly and properly by voltmeter and ammeter and note down it.

PRECAUTION

- ① Avoid loose connection
- ② Must wear rubber shoes.
- ③ Don't touch any hot point of the machine
- ④ Don't switch on off the supply without permission of the lab assistant or instructor.

TABLULATION :

OPEN	CKT	VALUE
Watt	Watt	Amp
20	115	0.6A

SHORT	CKT	VALUE
W	N	A
60x2	21	19.5

CALCULATION:

$$P_{\text{open loss}} = \text{core loss} + P_{\text{cu}}$$

$$I_{\text{m}} = I_0 \sin \phi_0$$

$$W_s = V_1 I_0 \cos \phi_0$$

$$\cos \phi_0 = W_s / V_1 I_0$$

$$= 20 / 115 \times 0.64$$

$$= 0.271$$

$$\phi_0 = \cos^{-1}(0.271) = 74.5^\circ$$

$$\sin \phi_0 = 0.96$$

$$I_c = I_m = I_0 \cos \phi_0$$

$$= 0.64 \times 0.271$$

$$= 0.17 \text{ A}$$

$$I_w = I_0 \sin \phi_0$$

$$= 0.64 \times 0.96$$

$$= 0.61 \text{ A}$$

CONCLUSION:

From the above experiment we studied about the open circuit test and short circuit test of 1- ϕ transformer and also found its parameter of equivalent circuit.

post Discussion question

Q. what is the difference in construction of dc motor and dc generator?
The construction of both machine is almost identical.

Q. what are types of dc motor?

① Series ② Shunt and ③ Compound motor.

Q. what are the use of shunt motor?

It is used in driving variable load like speed of drill the pump etc.

Q. what are various speed control.

① Field control method.

② Armature control method.

③ variation in applied voltage.

Q. what is the relation between flux and speed?

$$\text{Speed} \propto \frac{1}{\text{Flux}}$$

Q. what type of stator is employed with a slip-ring motor?

3-phase phase start type stator.

Q1) How the output power of motor is determined?
 $P_m = P_e (1-s)$

Q2) what are type of single phase motor?
Split phase, Capacitor induction, Shaded pole
Universal etc.

Q3) what is Universal motor?
The motor which can run with DC and well as with AC is called as Universal motor.

Q4) what are the application of universal motor?
It is used in table fans, portable machine tools, fraction etc.

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12-4-23

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