CERTIFICATE

Name : Kishore Miniara Class: (5th Sem)

Roll No : L210300026O3 Exam No.

Institution SCITM Semiliguda

This is certified to be the bonafide work of the student in the

EC-II *Laboratory during the academic*

year 20 / 20

No of practicals certified 6 *out of* 10 *in the*

subject of EC-II

.....
Teacher In-charge

.....
Examiner's Signature

.....
Principal

Date : 9.11.22

Institution Rubber Stamp

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

Particulars of The Experiments Performed

Date	Serial No	Experiment NO.	Subject/Experiment	Page No	Signature	Remarks
21.9.2022		01	Study of star-delta starter connection and runing a 3Ø induction motor	1–4	(1) 24.9.22	
23.9.2022		02	To study of DOL starter connection and running a 3-Ø induction motor	5–8	(2) 13.10.22	
12.10.2022		03	Study of Buchholz's relay	9–11	(3) 20.10.22	
19.10.2022		04	Study of induction type over current reverse power relay	12–18	(4) 27.10.22	
26.10.2022		05	Parallel operation of two alternators and study of load sharing	19–23	(5) 3.11.22	
2.11.2022		06	Determination of regulation of alternator by direct loading	24–30	(6) 9.11.22	
			29+18 (01 04 06 a) = 47			

PHYSICAL PROPERTIES OF SOME SUBSTANCES

	c.c.
	2.70
	8.4 to 8.7
	8.93
	22 to 26
	2.25
	8.3 to 8.5
	2.4 to 2.6
	2.9 to 4.5
	19.32
	7.86
	11.34
	8.5
	2.5 to 2.8
	1.15
	8.90
	87 to 93
	28.45
	10.49
	7.28
	7.14

LIQUIDS in 0°C

Alcohol	0.79
Carbon disulphide	1.3
Glycerine	1.26
Mercury	13.59
Olive Oil	.92
Petrol	0.64

MELTING POINTS OF SOLID ORGANIC SUBSTANCES (in °C)

Solid	M.P
Naphthalene	80.2
Phenol	40.9
Resorcinol	110
Pyrogallol	133
Tartaric acid	142
Citric acid	154
Benzoic acid	122.4
Salicylic acid	158
Oxalic acid sublime	101
L—D(+) Glucose	146
Cane sugar	160
Iodoform	120.123
Acetamide	80.1
Para dichlorobenzene	53
Acetanilide	11
Chloral Hydrate (Solid)	57

BOILING POINTS OF SUBSTANCES (IN oC)

Liquid	B.P.
Benzene	80.1
Toluene	110
Methyl alcohol	66
Ethyl alcohol	78
Glycerol	182
Benzaldehyde	178.9
Acetic acid	117.9
Acetone	56.24
Formic acid	100.8
Ethyl acetate	77.1
Ethyl benzoate	212.4
Chloroform	61.7
Chlorobenzene	131.7
Nitrobenzene	210.85
Aniline	184.4
Chloro hydrate (Liquih)	795

DRY TEST FOR ACID RADICAL

ydrochloric	Effervescence takes place evolving	
mmng.	(a) a colourless and odourless gass turning clear limewater milky.	(a) Carbonate
	(b) a colourless gass with a pungent smell of burning sulphur, turning acidified dichromate paper green.	(d) Sulphate
	(c) a colourless gass with a rotton egg smell turning lead acetate paper black	(c) Sulphide
	(d) a colourless gass with a pungent smell of burning sulphur, turning acidified dichromate paper green and also separates colloidal sulphur.	(d) Thiosulphate
	(e) a brown fumes having nitrous smell. Evolution of a gass together with hydrogen turning lead acetate paper black.	(e) Nitrite Any Sulphur acids
	(a) Brown fumes having nitrous smell which increases on adding copper turning.	(a) Nitrate and Nitrite
ydrochloric it (sulphur	(b) Brown vapour having pungent penetrating smell and increases on adding MnO_2.	(b) Bromide
	(c) Violes vapour depositing black solid and increases on adding MnO_2.	(c) Iodide
lphuric acid per turnings	(d) An only appearance at the beginning but on heating disappears evolving white acidic fumes which becomes dense with amonia vapour and turns clear water drop turbid.	(d) Fluoride
	(e) White acidic fumes which becomes dense with ammonia vapour and on adding MnO_2 gives a pungens penetrating smell turning moist starch iodide paper blue. Green edged flame.	(e) Chloride
ulfuric acid ol and the		
alcohol and	Green edged flame.	Borate
test using	Brown vapour giving yellow ppt. with lead acetate some acidified with acetic acid.	Boric acid
(Action of acid and		Chloride
test using	Positive test as above.	Chromate
lphuric acid id concible. ammonium on be cone.	A colourless vapour turning clear water drop-turbide	Silicate
	Yellow ppt. in cold or on boiling.	Arsenate
		Phosphate.

Expt.No. 01

Page No. 01
Date.

Aim of the experiment:- study of starting of 3-Phase induction motor with star-delta stator

APPARATUS REQUERED

Sl No	Name of the Apparatus	Rang		
1	Voltmeter	(0-300)(600)	moving iron	IND
2	Ammeter	(0-15) Amp	moving iron	IND
		(0-5/10) amp		
3	star-delta starter		manual	IND
4	connecting wire.			

MACHINE SPECIFICATION :-

Sl	Name of the machine	Rang Type	Type	Quantity
1	3Φ squirel cage	3Hp 440V	squirel cage	IND

THEORY :-

A-Three Phase induction motor when started from rest behaves like a three phase transformer with its secondary short circuited in this test we applied a reduced voltage to circulate the full load current if full voltage is supplied in the short circuited test then a very high current will be circulated in case of induction motor

OXFORD

Teacher's Signature .....

Expt.No.

Page No. 2
Date.

Star is connected to 3-Phase supply so motor draws heavy current a which damage the motor if follows for a long time due to high inertion Produce a more voltage in the line due to this the other machinary will be affected Therefor the starter are necessary for motor are 3-Types

(i) Star delta starter
(ii) DOL starter
(iii) Auto transformer

Star - Delta starter :-

This star delta is used in the case of motor which are built to run normally with a delta connected stator winding it consist of two way switch connects the motor in star for starting and then in delta for normally runing when star connected the applied voltage over each motor phase is reduced by a factor $1/\sqrt{3}$ and hence the torque developed become 1/3 of that which have been ducted of motor we are directly connected in delta the line current is reduced to 1/3 hence durenig starting period when motor is Y connected it take 1/3rd of much starting current.

1st Per Phase = 1/3 rd Per Phase

OXFORD

Teacher's Signature .....

Expt No.

Page No. 13
Date /

Procedure :-

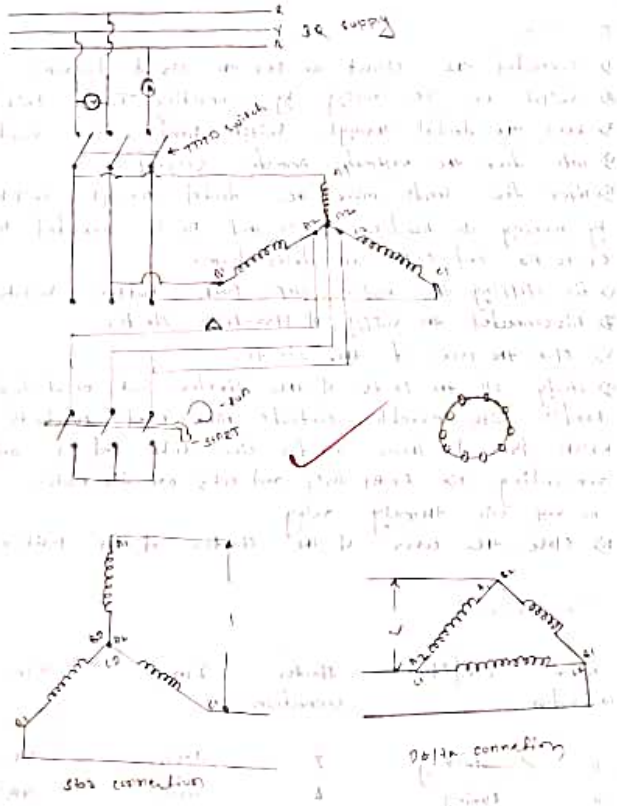
1) connected the circuit as per the circuit diagram
2) Switch on 3φ supply by connecting TPTD switch
3) Keep the double throw switch handle down words
4) note down the voltmeter ammeter reading
5) After few limit move the double throw switch by moving to handle up so that T_1 is connected B_2 C_1 to A_2 and C_2 B_1 in delta form.
6) for stopping the motor step push button switche
7) Disconnected the supply of star-delta starter
8) open the cover of the starter
9) study all the parts of the starter such as starter/run handle with movable contacts nine fixed contacts in which three of them are for line L_1L_2 and L_3 and remaining six B_1B_2 T_1C_1 and C_2B_2 are for motor no volt coil thermally relay
10) Close the cover of the starter at its position

Tabulation :-

No of observation	condition	Starter connection	I in	V_{in}
1	starting	Y	1.8A	418.8V
2	Running	Δ	43.12A	415V
3	Single phase			

OXFORD

Teacher's Signature .....



Expt.No.

Page No. / 4
Date. /

PRECAUTION :-

While performing the starting of 3 phase induction motor following precaution should be observed

1) The change over from star to delta connection should not be made until the motor attains about 90% of synchronous speed

2) Before coniute the cover of the starter supply must be disconnected

CONCLUSTION :- From the above exprement we conclude that when the handle is at start position the terminal of the starter connection in star and when comes at run position terminals are connected in delta no-volt coil and overload coil save the motor from under voltage and over loading

5

29.11.22

Name - Kishore Minoka
Rg-No - 2103000200 3
Br - Electrical Engg
Sem - 5th

OXFORD

Teacher's Signature .....

Expt.No. 6

Page No. 24
Date.

Name of the Experiment :-

Pedermination of voltage regulation of an alternator by zero power factor method

Aim of the Experiment :-

To find out the voltage regulation of 3-ϕ alternator by zero power factor

Theory :-

Plotting O.C.C :-

The o.c.c of the alternator is plotted the trgit is drawn to occ this is the air gap line & is represent the o.c.c of alternator it the reactance of iron portion of the magnetic circuit of machine is neglected compare to the reactance of air gap.

Plotting of zero power factor :-

It is the curve between terminal voltage and field current when the alternator is delivering its full rated current to a zpf lagging load

This alternator is delivering its full rated current to a zpf lagging load the test is carried out by running the alternator at synchronous speed and connecting a purely

OXFORD

Teacher's Signature .....

Expt.No.

Page No. 25
Date.

inductive load to the terminal

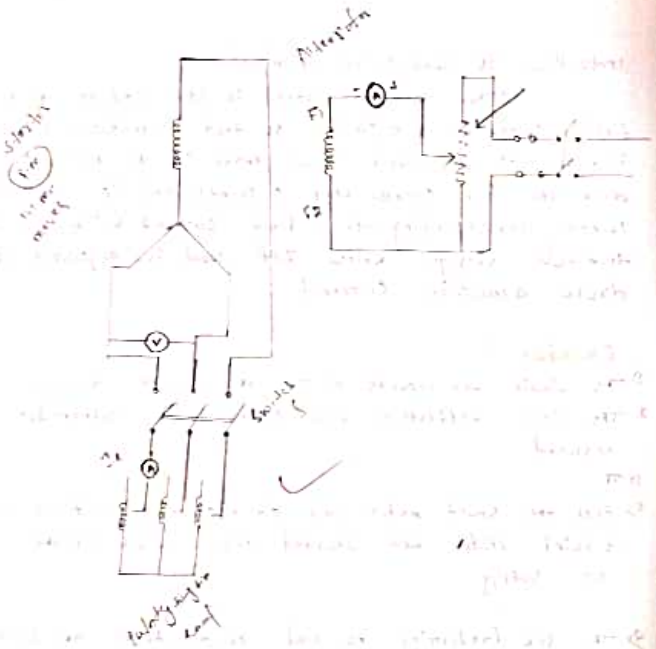
The load is varied is steps and at each step field current is adjusted so that armature current is equal to the rated value. There is no need to draw the full curve only 2 points and 'c' that is point corresponding to 0 field current while related terminals voltage while ZPF load is adjusted to drate armature current

Procedure :-

1) The circuit was connected as per the circuits diagram
2) The zero excitation was applied to the alternator was ensured
3) Both the shunt motor and alternator by makers of 3-point stator was started once switch on the DC supply
4) The one performing no load characteristics the field current was varried and volt is different currents is measured
5) Again the ZPF was performed when field current load fixed.

OXFORD

Teacher's Signature .....



Expt.No.

Page No. 26
Date.

ST NO	NO load character	ZPF	characteristic
1	0	0	0.58 145 4.5
2	0.1	70	0.68 175 4.5
3	0.2	135	0.80 201 4.5
4	0.3	180	
5	0.4	205	
6	0.5	220	
7	0.6	232	
8	0.7	249	
9	0.8	249	

PRECAUTION :-

1) Avoid loose connection

2) Wear rubber and leather shoes

3) Don't start the machine with the permission concern teacher.

4) Don't touch any bar parts of the panel

Teacher's Signature .....

Expt.No.

Page No. 27
Date.

ANALYSIS And DISCUSSION :-

from the graph Taxs drop = 160 · 20 = 40

OI = FB · 0·27A = 5V

$E = \sqrt{(V\cos\theta)^2 + (V\sin\theta + IaRa)^2}$

$= \sqrt{(230 + 0.8)^2 + (230 \times 0.6 + 40)^2}$

$= 256 \cdot 0V$

point N corresponding to E_0

Voltage regulation $= \frac{E_0 - V}{V} \times 100$

$= \frac{270 - 230}{230} \times 100 = 17.39\ \%$

Experiment Quiz :-

1) what is a.c.c ?

O.C.C is the airgap line and it is represented as the o.c.c curve of the alternator if reluctance of iron of the magnetic circuits of machine is neglected as compare to the reluctance of airgap

OXFORD

Teacher's Signature .....

Expt.No.

Page No. 28
Date.

4) What is ZPF curve ?

ZPF curve is the curve between terminal voltage & field current when alternator is delivering its full load current at a ZPF lag current at a ZPF lagging load

3) What are the types of alternator in the basic of rotor

- cylindrical pole type rotor alternator
- salient pole types rotor alternator

4) What is the voltage regulation ?

It is the defined as the difference between new load voltage and terminal voltage divided by terminal voltage and multiply by 100

5) formula for voltage regulation ?

$$VR = \frac{E_0 - V}{V} \times 100$$

where E_0 = no load voltage V = terminal voltage

6) what is slip ring ?

It is an electromagnetic devices that

OXFORD

Teacher's Signature .....

Expt.No.

Page No./ 29
Date./

allow the transmission of power from motor to motor or vice versa

7) What is Principle of alternator

Alternator work on the principle of electromagentic induction is when flux linking a conduction changes an emf is induced in the conductor

8) Frequency & speed relation in alternator

$N_s = 120 f/p$

N_s = synchronous speed f = frquency
p = no of poles

9) formula of power fuction ?

$\cos \phi = P/VI$

OXFORD

Teacher's Signature .....

Expt.No.

10) What is distribution factor ?

The distribution factor is one of the winding factor which is known as kd it is the ratio of emf with distribution winding & concentration winding.

9.11.22

Kishore Minjars
Roll No - L2103000????
Br - Electrical engg
(5th Sem)

Teacher's Signature ....