

## 2: ELECTRICAL TECHNOLOGY (FA, FB, FC)

### Scheme of Examination

#### Std. XII

Paper	Title of the Paper	Theory		Practical		Term work	Project work	I.V.*	OJT**	Total Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)					
3	Electrical Machines	80	3	80	3	10	10	10	10	200

\* IV = Industrial Visits    \*\* OJT = On Job Training

### Practical

Sr. No.	List of Practical's	Periods
1.	Dismantling reassembling techniques of testing instruments	12
2.	To study of 3 phase transformer for its various connections i.e. star/star, star/delta, delta/star, scot	12
3.	Visit to transformer manufacturer	12
4.	Connect, start, run and reverse given 3 phase induction motor	12
5.	Measure starting and running current, voltage & speed of 3 phase induction motor	12
6.	Control the speed of 3 phase induction motor by various methods (by varying method by changing pole method)	12
7.	Dismantling the three phase motor	8
8.	Dismantling testing resembling and installation of three phase motor	12
9.	Noting data of burnt motor and remove the coils and clean the slot	12
10.	Insulate the slots, prepare new coils as per old could, in setting wedges in the slots, of rewind starter, tapping & binding & shaping of rewind starter coil	12
11.	Baking and varnishing of rewind starter	12
12.	Test the rewind motor, assemble the motor, test it and start and run	12
13.	Estimation, costing and billing of 3 phase induction motor rewind	8
14.	Find out start and end terminals by two voltmeter or two amp meter test the coil	8
15.	Study of control circuits accessories, preparation of simple circuits	12
16.	Dismantle the electric pump repairing and reassembling it	12
17.	Dismantle the submersible pump, repairing and reassemble it, study of float switch	12
18.	Study of relays, setting of relays	12
19.	Study of DOL starter and connect to three phase induction motor	12
20.	Study of fully automatic star delta starter and connect to 3 phase	12

	induction motor, replacement of faulty parts in starter	
21.	Visit to rewinding shop and prepare detailed report	12
	<b>Total</b>	<b>240</b>

## Reference Books

1. Electrical Technology - Edward Hughes
2. Electrical Technology - H. Cotton
3. Study of Electrical Appliances and devices - K.B.Bhatia
4. Elements of Electrical Gadgets - K.B.Bhatia
5. Small Appliances Servicing - P.T. Brook Woll Jr.
6. How to repair small Appliances - Jack Darr
7. Electrical Wiring Estimating & Costing - J. D. Gupta
8. Audels Home appliances servicing - Edwin P. Anderson
9. Electrical Motor Repair - I. M. Anwani
10. Electrical Wiring Estimating & Costing - S. L. Uppal
11. Electrical Motor Winding & Repair - Anwani
12. Basic Electrical Engineering - A Kastkin
13. Basic Electricity (Hindi) - K. B. Bhist
14. Maintenance of Domestic Appliances - R. B. Lal
15. Audels Electrical Motor Guide - Edwin P. Anderson
16. House Wiring Practice - T. D. Bhise
17. Indian Electricity Rules - Nausheer Bharocha
18. Fundamental's of Electricity - Kernard C. Graham
19. Electrical Engineering - B. L. Theraja P - I, II, III, IV
20. Basic electronics - By V. K. Me
21. Basic Electricals - By B. L. Jheraja

## INFRASTRUCTURE

1. Classroom =400sf with charts, display board, black board, ohp, computer with internet facility
2. Workshop/lab =600sf with required appliances and wiring material, wiring boards at least two, charts, display board, black board, ohp, computer with internet facility
3. Electric power supply at least 5KW, 3 phase
4. Pure drinking water facility
5. Library may be common but separate store required

<b>List of Equipment</b>		
<b>Sr. No.</b>	<b>Description</b>	<b>Quantity</b>
1	Air conditioner functioning	1
2	Ammeter A.C. and D.C. analog	8
3	Ammeter multi range A.C. D.C.	8
4	Armature winding machine	1
5	Battery charger	2
6	Battery lead acid diff. types	2
7	Bi-metallic relay,	2
8	Blow lamp with 1ltr capacity	1
9	Wiring board	1
10	Centrifugal Pump	1
11	Ceiling fan winding machine	1
12	Centrifugal switch	1
13	clip on meter	2
14	Coil winding machine with counter clutch arrangement	1
15	Decorating night lamp for ceiling lamp	3
16	Digital energy meter single phase	1
17	Digital energy meter three phase	1
18	Digital panel mounted ammeter 0-20A	2
19	Digital panel mounted voltmeter 0- 500 V	2
20	Digital stop watch	1
21	Digital tachometer	1
22	Dimmer stat single phase	1
23	Dimmer stat 3 phase	1
24	Drawing oven with thermostat 230V single phase	1
25	Dummy new rewinded armature for universal motor	2
26	Dummy squirrel cage rotors of 1/3 phase	2
27	Dummy stators single phase/ three phase	2
28	Dummy transformer core/ stamping diff. sizes	2
29	Earth resistance testing set with spikes	1
30	Electric hand drill machine with bits	2
31	Electric microwave oven	1

32	Electric bell indicator	2
33	Electric blender/juicer	1
34	Electric blow fan	1
35	Electrical cabinet/cabin fan	1
36	Electrical ceiling fan	4
37	Electrical cutter/grinder	1
38	Electrical domestic floor mill	1
39	Electrical domestic vaccum cleaner	2
40	Electrical exhaust fan	2
41	Electrical food processor	1
42	Electrical hand drier	1
43	Electrical heat convector	2
44	Electrical induction cooker	2
45	Electrical invertors	1
46	Electrical iron ordinary, automatic, spray, laundry	4
47	Electrical room cooler	2
48	Electrical Soldering iron	4
49	electrical table fan	1
50	Electrical tea and coffee maker	1
51	electrical toaster	2
52	Electrical UV/RO Purifier	1
53	Electrical voltage stabilizer	1
54	Electrical washing machine Semi/ Automatic	2
55	Electrical water boiler	2
56	Electrical wind generator (model)	1
57	Electronic relay, electronic timer	2
58	Emergency torch/light	2
59	External growler	1
60	Fan regulator diff. types	4
61	Fluorescent tube with accessories	5
62	Frequency meter	1
63	Internal growler 250V	1
64	Mercury vapor lamp	1
65	Sodium vapor lamp	1
66	MCB's and ELCB's	2
67	Capacitor Motor	1
68	Capacitor start capacitor run motor	1
69	Sheded pole motor	1
70	Split phase motor	1
71	Squirrel cage induction motor 3 phase	1
72	Universal motor	2
73	Multi stage pump	1
74	Ohm-meter	1
75	Oil can	1
76	Phase sequence indicator	1

77	Starter auto transformer for 3 phases induction mot.	1
78	Starter automatic star/delta for squirrel cage induction 3 phase motor	1
79	Starter DOL for squirrel cage 3phase induction motor	1
80	Transformer C.T.	1
81	Transformer 230/6V 12V 2.5A	1
82	Power factor meter	1
83	Rectifier bridge, half wave, full wave	3
84	Refrigerator	1
	<b>Total</b>	<b>142</b>

<b>List of Tools</b>		
<b>Sr. No.</b>	<b>Description</b>	<b>Quantity</b>
1	Adjustable pipe wrench350mm	2
2	Adjustable stator holder for rewinding work	2
3	Adjustable wrench	2
4	Allen key set (Metric)	2
5	Auto wire insulation stripper	5
6	Bearing puller suitable for 5HP motors	1
7	Bench vice 150mm, 200mm	2
8	Chisel cold 12mm, 300mm,12mm 350 mm	8
9	Chisel firmer with handle	4
10	Crimping tools	1
11	De-soldering pump and wire	2
12	Dial gauge	1
13	Electrical knife with double blade	5
14	Electronic leak detector digital type	1
15	File set	1
16	Fire buckets 10 ltr	2
17	Fire extinguisher	1
18	Grease gun	2
19	Hack saw mini	5
20	Hammer ball pen	4
21	Hammer claw	2
22	Hammer straight pain	2
23	Hand drill machine with bit	1
24	Home protector	1
25	Hydrometer	1
26	Insulated side cutting pliers 10mm, 150mm	10
27	Mallet	2
28	Pincer	2

29	Pipe cutter	2
30	Pliers insulated combination flat nose, long nose	20
31	Spanner box set	1
32	Spanner set ring type	1
33	Spanner set box type	1
34	Spirit level	1
35	Standard wire gauge	2
36	Scissors	4
37	Screw driver set	5
38	Screw driver connector	5
39	Tube holder	4
40	Winding wire cutter	2
41	Wire pusher	1
42	Coil spreader	2
43	Electrical wrench diff. type	1
44	Tenon saw	2
45	Neon line tester	10
	<b>Total</b>	<b>138</b>