NYPUNYAM
SKILLS FOR TOMORROW
February 5-7 | 2016, Thiruvananthapuram, Kerala

ELECTRICIAN

SKILL FIESTA - 2016

Test Project Format – State Level

Trade: ELECTRICIAN

Duration of the Test: **6 Hours**

Project Brief :

1. Panel board with rheostatic rotor starter has to be commissioned.
2. The concept of panel/board wiring is incorporated in which capabilities of wiring lay out, methodology of individuals skills will be displayed.
3. The candidate should work precisely to provide safe and reliable installation.

Final outcome expected from the candidates:

Speed, accuracy and flexibility to complete the task will be measured after:

- Layout of the panel board has prepared
- Accessories / equipments / instruments are mounted as per layout
- Slip ring induction motor is wired up with the panel board using metal conduit
- Proper earthing is provided
- Insulation resistance of the installation is measured
- Panel board installation is tested
- Fixing of individual components, routing of cables/ wire, checking the panel board before commissioning and integrating it with motor for testing is to be done by the candidate

DESCRIPTION OF PROJECT /TASKS

Panel board wiring for Slip Ring Induction Motor Starters

- Wiring of the given panel board
- Connect the panel board to the given 3 phase squirrel cage induction motor
- Test the circuit for results

Steps:

- Prepare the layout of the panel board
- Mark the position of the accessories
- Drill holes for wire entry and for fixing accessories wherever necessary
- Make the required mounting arrangement for the accessories
- Mount up the accessories on the panel board
- Fix the panel board on the frame work
- Wire up the accessories in the panel board – TPIC-N unit, voltmeter, ammeter, selector switch , stator and rotor starter, lamps, switch fuse units
- Check the motor, conduct insulation test
- Connect the 3 phase slip ring induction motor starter
- Connect the earth wire with earth bolts/screws measure the length, cut, skin , bend to required length – route and connect
- Label the cables end with number or letter labels
- Connect and terminals the cable ends to respective terminals
- Test the wiring visually
- Wire, route , tie and bring out the wires to be connected
- Connect the 3 phase slip ring induction motor

- Ask permission for checking the panel wiring with supply
- Show the working of 3 phase lamps
- Show the readings of measuring instruments - voltmeter & ammeter for 3 phases
- In case of fault rectify

TECHNICAL DETAILS:

Participant should possess

- Concentration, precision, accuracy should be the hall marks of his work
- Attention to every process step since mistakes are largely irreversible, costly and potentially life threatening.]
- Should collect relevant safety information & regulation
- Tools / instruments/ equipments should be handled properly
- Earthing, insulation test to be given highest priority

INSTRUCTIONS TO THE COMPETITOR:

Electrician has to ensure that

- For using power tools , goggles is a must
- Safety shoes should be worn.
- Proper dress code is followed. Eg. Shirts with sleeves and long trousers
- Wear Preferably ITI uniform without ties
- The materials should be handled with gloves
- All devices covers should be properly placed
- He should not use bare/ exposed conductors
- Tools should be handled with care

- The work place should be neat and tidy
- The visual & mandatory tests to be done before consent
- The testing of circuits with power is done after taking consent
- Crimping sockets/ lugs should be used for cable end termination
- Sufficient length of cables is provided for connecting the panel board to motor
- He should wire a safe and reliable electrical installation
- The care is taken for easy maintenance of service standards and diagnosing malfunctions

Electrician should not:

- Disturb others
- Move out of his place
- Bypass safety while working
- Switch on the units before informing examiner
- Talk/ Interventions
- Bring external tools inside
- Take others help
- Project the apparatus beyond any edge of the panel
- Use other tools for crimping
- Bring readymade wiring from outside
- Spoil/ disturb/damage/block/ competitors practical's directly or indirectly
- Try to influence Assessors /Examiners/Judges by any means

Wire up a panel board for 3-Phase Slip –Ring Induction Motor

Steps to be implemented:

- Mark the layout on the plywood panel board as per the given layout.(Figure 1)
- Drill holes for wire entry and for fixing accessories on the panel board.
- Mount the accessories & instruments in proper position firmly..
- Wire up the voltmeter & indicating lamp circuits using 1sq. mm PVC copper wire - Refer figure 2
- Wire up TPIC, ammeter circuit and starter circuits using 4 sq.mm PVC copper wire . Refer figure 2
- Label the cable ends with number or letter labels
- Harness the cable ends with number or letter labels
- Connect and terminate the cable ends to the respective terminals.
- Ensure that the cables should not overlap
- Ensure that the cables' /cable end should not cause any hindrance to the operation of switches/ starters
- Provide proper earth connections to the metal covering of TPIC , starter and angle iron frame using 14 SWG copper wire
- After completing the wiring and visually inspecting for correctness, inform the examiner for validation
- Switch on the circuit, run the motor and show the readings of ammeter and voltmeter to the examiner

Diagram 1

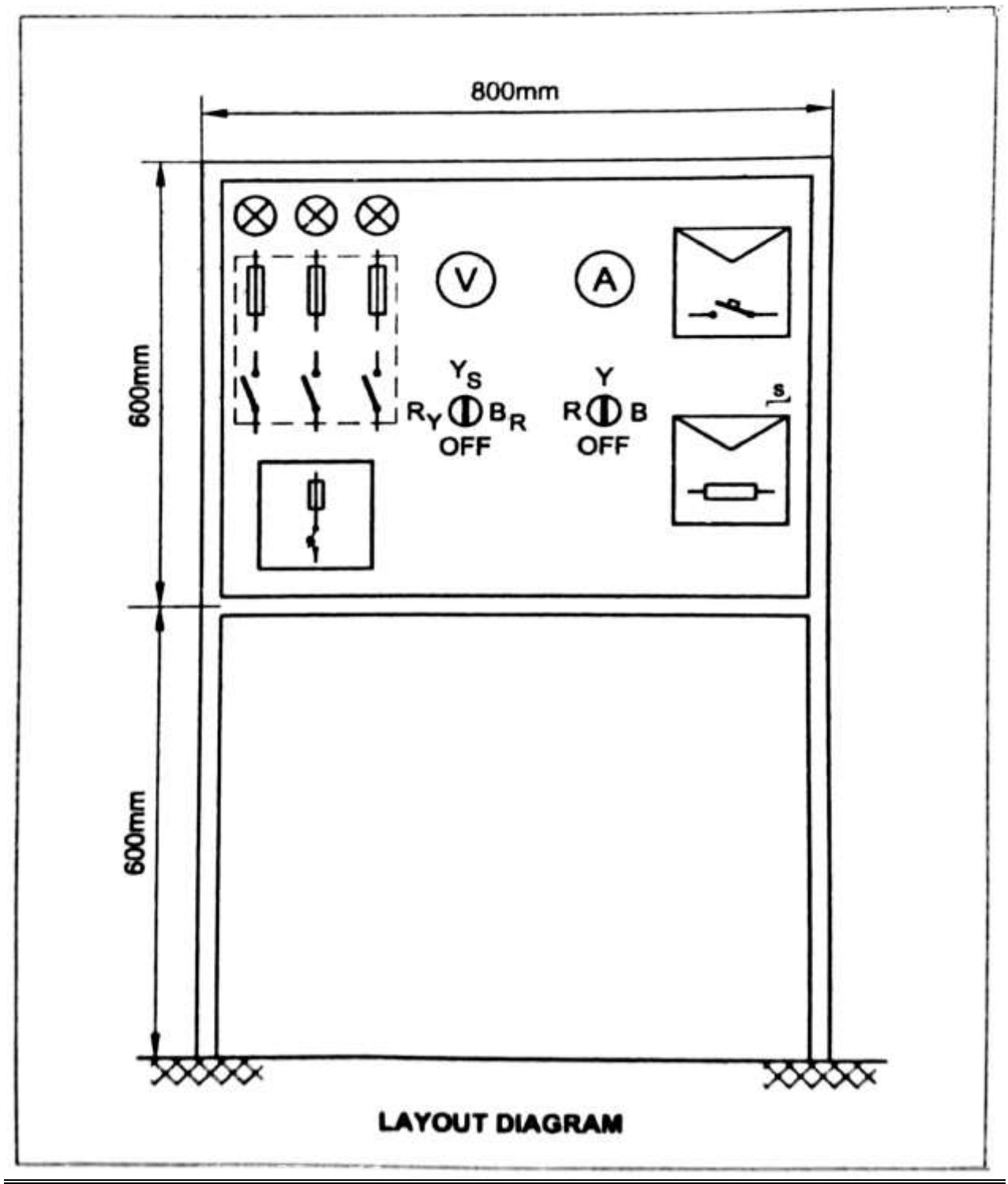
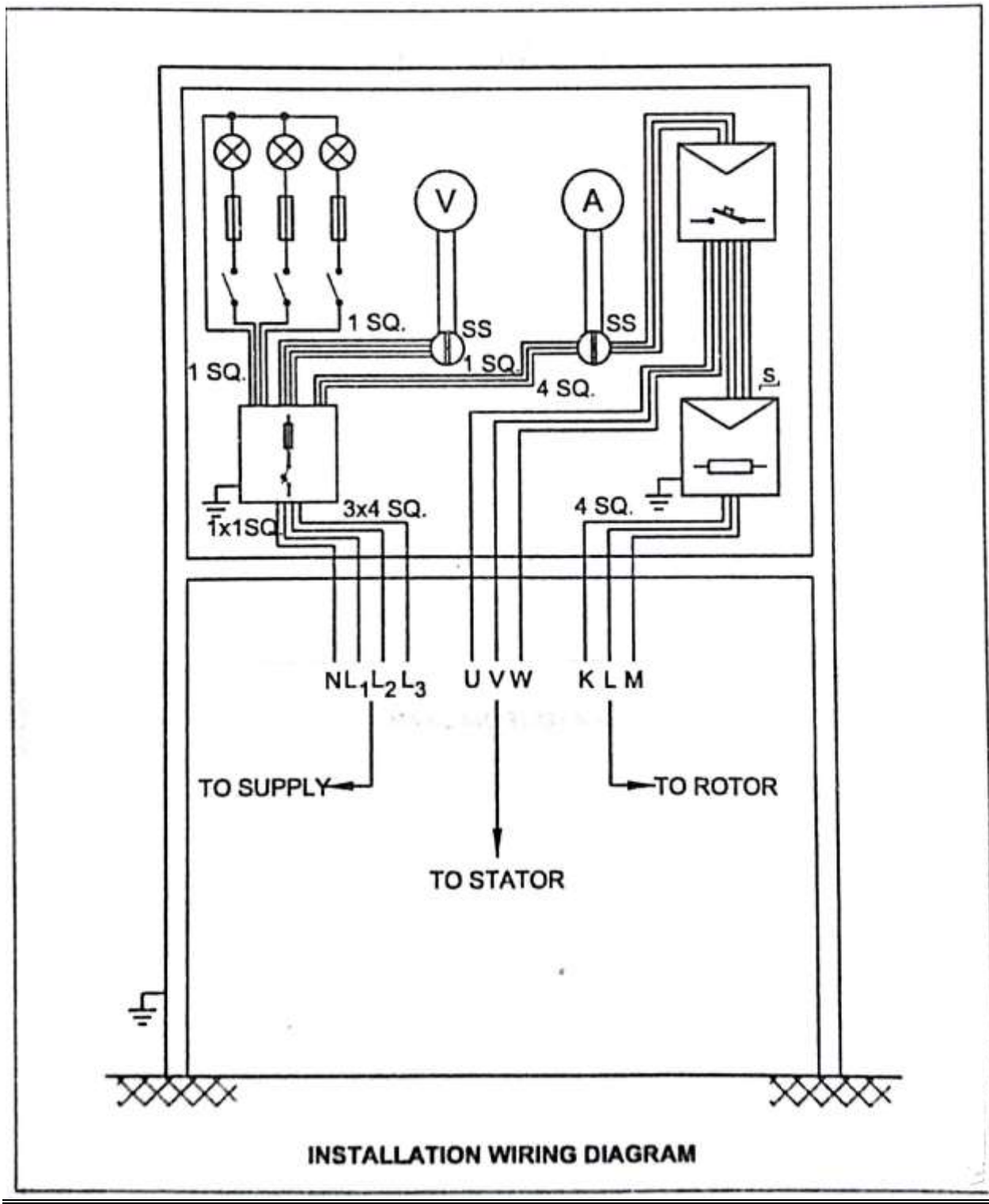
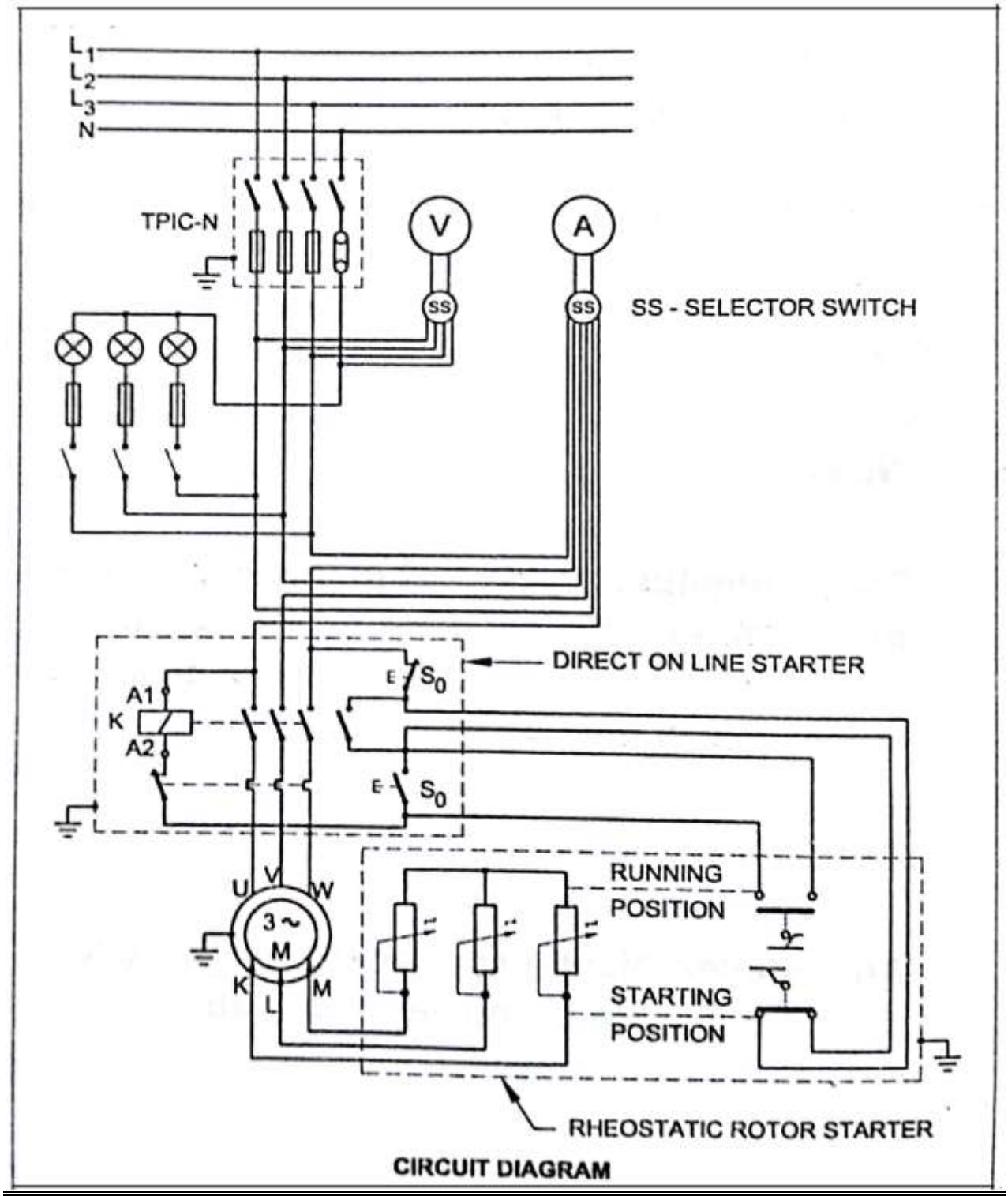


Diagram 2



INSTALLATION WIRING DIAGRAM

Diagram 3


L1
L2
L3
N
TPIC-N
V
A
SS
SS
SS - SELECTOR SWITCH
DIRECT ON LINE STARTER
A1
K
A2
E
S0
E
S0
U
V
W
3~
M
K
L
M
RUNNING
POSITION
STARTING
POSITION
RHEOSTATIC ROTOR STARTER
CIRCUIT DIAGRAM

SKILL FIESTA 2016

Consolidated Equipment list

Sl.No	Tools and Instruments	Specification	For 1 Batch	Batch of 6
1	Electricians tool Kit		1 No	6 Nos
2	Electric Drilling m/c	capacity 0 - 12 mm	1 No	6 Nos
3	Hacksaw frame adjustable	300 mm	1 No	6 Nos
4	Try square -	200 mm	1 No	6 Nos
5	Steel rule	300 mm	1 No	6 Nos
6	Crimping tool	1 - 6 sq mm	1 No	6 Nos
7	Drill bit	4 mm	1 No	6 Nos
8	Drill bit	6 mm	1 No	6 Nos
9	Meggar	1000V	1 No	6 Nos
10	Conduit Die set	25mm	1 No	6 Nos
11	Pipe vice		1 No	6 Nos
12	Fish wire		1 Set	6 Sets
	Materials Required			
1	Slip ring induction motor	3 phase 415V,50Hz,3.75Kw	1 No	6 Nos
2	Suitable starters for stator and rotor	415V, 6-10A	1 Set	1 Set
3	TPIC switch with neutral	500V ,16A	1 No	6 Nos
4	Rotary selector switch for Voltmeter- 3 position with off	500V , 6A	1 No	6 Nos
5	Rotary selector switch for Ammeter - 3 position with off	500V , 16A	1 No	6 Nos
6	Plywood panel board - one side teak	800 x 600 x 12 mm	1 No	6 Nos
7	Angle iron frame 25 x 25 x 3 mm with 2 legs 600 mm height	800 x 600 mm	1 No	6 Nos
8	Panel type MI Voltmeter	0 - 600 V	1 No	6 Nos
9	Panel type MI Ammeter	0 - 15 A	3 Nos	18 Nos
10	SPT switches - surface mounting	240 V , 6A	3 Nos	18 Nos
Sl.No	**Tools and Instruments**	**Specification**	**For 1 Batch**	**Batch of 6**
	Materials Required			
11	Rewirable fuse unit surface mounting	240 V , 16A	3 Nos	18 Nos
12	Batten Holder BC	240 V , 6A	3 Nos	18 Nos
13	Incandescent lamp	240 V ,15 Watts	3 Nos	18 Nos
14	Heavy gauge metal conduit	25 mm	17 mtr	102 mtr
15	Conduit coupler	25 mm	2 Nos	12 Nos
16	Conduit bend	25 mm	11 Nos	66 Nos
17	GI conduit saddles	25 mm	3 Nos	18 Nos
18	Flexible coupler	25 mm	4 Nos	24 Nos
19	Flexible pipe	25 mm	1 mtr	6 mtr
20	Earthing Clips	25 mm	3 Nos	18 Nos
21	PVC/ Wooden bushes	25 mm	6 Nos	36 Nos
22	Bare copper wire	14 SWG	12 mtr	72 mtr
23	PVC copper wire	4 sq mm	60 mtr	360 mtr
24	PVC copper wire	1 sq mm	10 mtr	60 mtr
25	Wood screws	20 x no 4	25 Nos	150 Nos
26	Rawl bit with holder	No. 10	6 Nos	36 Nos
27	GI wire	8 SWG	2 k	12 k
28	Cable bands or PVC / Nylon straps for cable binding	6 mm	30 Nos	180 Nos
29	Machine Screws with nuts	M5 x 30 mm	16 Nos	96 Nos
30	Crimping sockets / lugs	1 sq mm	20 Nos	100 Nos
31	Crimping sockets / lugs	4 sq mm	30 Nos	180 Nos
32	Check nuts	25 mm	4 Nos	24 Nos
33	Clamps heavy guage for 3 conduits	75 mm & 12 mm	as required	as required

MARKING SCHEME (OUT OF 100)

SUBJECTIVE MARKS AND OBJECTIVE MARKS

SECTION	CRITERION	MARKS		
		SUBJECTIVE	OBJECTIVE	TOTAL
A	Safety -Personal and Electrical	10		10
B	Installation of Panel Board Equipments		25	25
C	Circuit Wiring - Wiring of Panel Board Equipments		5	5
D	Circuit design		5	5
E	Measurements		15	15
F	Wiring and termination		10	10
G	Installation testing - Results		30	30
Total		**10**	**90**	**100**

Subjective Marking to be conducted using Bench mark and Scale to indicate

0 : No attempt

1 - 4 : Below standard

5 -8 : Above standard

9- 10 : Excellent

Objective Marking : Judgemental based on experience

: Decided by the assesor

Results : Within Time - 10 Marks

45 minutes before - 15 Marks

90 minutes before - 20 Marks

120 minutes before - 25 Marks

180 minutes before - 30 Marks