Syllabus for the subject

of

ENGINEERING DRAWING

(For 3rd & 4th semester)

Under

CRAFTSMEN TRAINING SCHEME (CTS)

For the trades of

1. Electronics Mechanic
2. Mechanic Consumer Electronics Appliances
3. Technician Power Electronics System
4. Electrician
5. Electroplater
6. Lift and Escalator Mechanic

Re-Designed in

2015

By

Government of India

Ministry of Skill Development & Entrepreneurship

Directorate General of Training

CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE

Block - EN - 81 SECTOR - V, SALT LAKE CITY, KOLKATA - 700 091

3rd semester--- Engineering Drawing

Sector: Electronics & Hardware

For the Trade of

1. Electronics Mechanic
2. Mechanic Consumer Electronics Appliances
3. Technician Power Electronics System

Sl. No.	Topics	Duration in Hours
1	**CRO: -** Block diagram of Cathode Ray Oscilloscope (CRO). Block diagram of Digital storage Oscilloscope (DSO). Front panel view of CRO & DSO.	66
2	**Surface Mounting devices (SMD):-** Front panel view of SMD station. IC package of SMD.	
3	**Electrical Protective Devices:-** Symbol of MCB (Miniature Circuit Breaker), ELCB (Earth Leakage Circuit Breaker), DOL starter, Relays.	
4	**Microcontroller:-** Block diagram of 8051. Pin configuration of 8051.	
5	**Modulation: -** Block diagram of super Heterodyne Radio Receiver. Block diagram of AM and FM receiver.	
6	**Power supply:** Block diagram of SMPS. Block diagram of UPS-ONLINE, OFFLINE, LINE INTERACTING.	

4rd semester---- Engineering Drawing
Sector: Electronics & Hardware
For the Trade of

1. Electronics Mechanic
2. Mechanic Consumer Electronics Appliances
3. Technician Power Electronics System

Sl. No.	Topics	Duration in Hours
1	**Symbol of electronic component:-** A. Thermocouple B. Strain Gauge C. LVDT(Linear variable differential transformer) D. Proximity Sensor	66
2	**DTH system:-** Block diagram connections of Home system. Direct To Home(DTH).	
3	**Cell Phone:-** Block diagram of cell phone receiver system.	
4	**Generator:-** Front panel control for function Generator.	
5	**Project related Drawings:-** A. Dancing LED's B. Smoke detector C. Mobile charger D. Metal detector	

DETAILS OF SYLLABUS
3RD SEMESTER ENGINEERING DRAWING

Sector: Power Generation, Transmission, Distribution, Wiring, and Electrical Equipments

For the trades of

1. Electrician
2. Electroplater
3. Lift and Escalator Mechanic

Sl. No.	Topics	Duration in Hours
1	**Sign & Symbol Trade related** **Alternating Current** Drawing of simple electrical circuit using electrical symbols. Drawing of sine square & triangular waves. Diagram of battery charging circuit. Practice in reading typical example of circuit containing R, L & C. Reading of electrical drawing.	66
2	**Electronic components** Symbols for electronic components. Diode, Transistor, Zener diode, S.C.R., UJT, FET, I.C. Diac, Triac, Mosfet I.G.B.T etc. Drawing of half wave, Full wave and Bridge rectifier circuit. Drawing circuit for a single stage Amplifiers and Multi stage Amplifies and types of signals. Drawing of circuit containing UJT, FET & Simple power control circuits. Free hand drawing of Logic gates and circuits.	
3	**Electric wirings & Earthing** Detailed diagram of calling bell, & Buzzers etc Free hand sketching of Staircase wiring. Drawing the schematic diagram of plate and pipe earthing. Diagram for electroplating from A.C and D.C source.	
4	**DC machines** Graphic symbols for Rotating machines. Sketching of brush and brush gear of D.C. machines. Sketching of D.C. 3-point and 4-point starter . Layout arrangement of D.C. Generators & motors, control panel. Exercises on connection to motors through Ammeter, voltmeter & K.W. meters of electrical wiring diagram. Drawing the schematic diagram of D.C. motor speed control by Thyristor / DC Drive.	
5	**Transformer** Graphic symbols for Transformers. Free hand sketching of transformer and auxiliary parts and sectional views. Sketching a breather. Drawing the diagram of typical marking plate of a distribution transformer.	
6	**Illumination** Free hand sketching of Mercury vapour lamp, sodium vapour lamp, Fluorescent tube (Single & Twine), MHL lamp and their connection.	

DETAILS OF SYLLABUS

4th SEMESTER ENGINEERING DRAWING

Sector: Power Generation, Transmission, Distribution, Wiring, and Electrical Equipments

For the trades of

1. Electrician
2. Electroplater
3. Lift and Escalator Mechanic

Sl. No.	Topics	Duration in Hours
1	**Three phase Induction motor** Free hand sketching of Slip-ring and Squirrel cage Induction motor. Typical wiring diagram for drum controller operation of A.C. wound rotor motor. Drawing the schematic diagram of Autotransformer starter, DOL starter and Star Delta Starter. Drawing the schematic diagram of A.C. motor speed control by SCR /AC Drive.	66
2	**Alternator** Tracing of panel wiring diagram of an alternator. Drawing the schematic diagram of automatic voltage regulators of A.C. generators.	
3	**Winding** Drawing the development diagram for D.C. Simplex Lap & Wave winding with brush position. Drawing the development diagram of A.C 3 – Phase, 4 Pole 24 slots single layer winding.	
4	**Control Panel** Practice in reading panel diagram. Local & Remote control of Induction motor with inching. Forward & Reverse operation of Induction motor Automatic Star Delta Starter Automatic star delta starter with change of direction of rotation Sequential control of three motors.	
6	**Distribution of Power** Types of insulator used in over-head line. (Half sectional views) Different type of distribution systems and methods of connections. Layout diagram of a substation. Single line diagram of substation feeders.	