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**

**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

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| --- | --- | --- | --- | --- |
| **Sl.** |  | **Topics** |  | **Duration** |
| **No.** |  |  |  | **in Hours** |
|  | **Sign & Symbol Trade related** |  |  |  |
|  | **Alternating Current** | |  |  |
|  | Drawing of simple electrical circuit using electrical symbols. | |  |  |
| 1 | Drawing of sine square & triangular waves. | | 66 | |
|  | Diagram of battery charging circuit. | |  |  |
|  | Practice in reading typical example of circuit containing R, L & C. | | | |
|  | Reading of electrical drawing. | |  |  |
|  | **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. | |  |  |

1. 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.

**Electric wirings & Earthing**

Detailed diagram of calling bell, & Buzzers etc

1. 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.

**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 .

1. 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.

**Transformer**

Graphic symbols for Transformers.

1. 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.

**Illumination**

1. 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

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| --- | --- | --- |
| **Sl. No.** | **Topics** | **Duration in** |
|  |  | **Hours** |
|  |  |  |
|  | **Three phase Induction motor** | 66 |

Free hand sketching of Slip-ring and Squirrel cage Induction motor.

1. 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.

**Alternator**

Tracing of panel wiring diagram of an alternator.

1. Drawing the schematic diagram of automatic voltage regulators of A.C. generators.

**Winding**

Drawing the development diagram for D.C. Simplex Lap & Wave winding

1. with brush position. Drawing the development diagram of A.C 3 – Phase, 4 Pole 24 slots single layer winding.

**Control Panel**

Practice in reading panel diagram.

Local & Remote control of Induction motor with inching.

1. 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.

**Distribution of Power**

Types of insulator used in over-head line. (Half sectional views)

1. Different type of distribution systems and methods of connections. Layout diagram of a substation.

Single line diagram of substation feeders.