Syllabus for the subject

of

WORKSHOP CALCULATION & SCIENCE

(For 3rd & 4th semester)

Under

CRAFTSMEN TRAINING SCHEME (CTS)

(For Instrument 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
Workshop Calculation and Science
Instrument Mechanic

Calculation			Science		
Sl. No.	**Description**	**Hrs.**	**Sl. No.**	**Description**	**Hrs.**
1	Indices: Laws of indices related problems. Quadratic Equation: Introduction, solution of simple Quadratic equation and related problems.	21	1	**Elasticity:** Stress, strain, Modulus of elasticity, elastic limit, Hooks law, young's modulus.	21
2	Calculation on volume & weights of solid & hollow bodies. C.G.S. & S.I. system of units of force, weight etc. Defining work, power energy, torque. Laws of conservation of energy, Forms of energy, kinetic energy & potential energy.		2	**Material:** Introduction, types and properties. Uses of Conducting, Semi-conducting and insulating materials.	
3	Pressure:- Pneumatic pressure, PSI, bar, atmospheric pressure, pressure gauge and absolute pressure.		3	**Magnetism:** Magnetic material, magnetic field, flux density, magnetic moment, m.m.f. Reluctance, permeability, susceptibility, electromagnet, solenoid and its practical applications.	
4	Units of volume. Calculation on volume, unit conversions. Calculations on relation between volume, mass and density.		4	Heat and temperature: Definition, difference between heat and temperature. Units of temperature. Conversion of temperature units.	

4th semester
Workshop Calculation and Science
Instrument Mechanic

Calculation			Science		
Sl. No.	Description	Hrs.	Sl. No.	Description	Hrs.
1	Simple problems on profit and loss. Simple and compound interest.	21	1	Power transmission by shaft, belts and ropes.	21
			2	**Friction:** Law of friction, co-efficient of friction, angle of friction, advantage and disadvantage of friction.	
2	Control valve terminology. With simple calculations, calculations on the cost of repair and recondition control valves.		3	**Force:** Resolution and Composition of forces. Representation of forces by vectors, simple problems on lifting tackles like Jib wall, crane solution of problems with the aid of vectors, General condition of equilibrium for series of forces on a body.	
3	Number Systems: Introduction, Decimal, Binary, Octal, Hexadecimal, BCD code, ASCII code, Bit, Byte, KB, MB, GB, Conversion, Addition, Subtraction, Multiplication, Division, 1st and 2s complement method, 9s and 10s complement method. Boolean Algebra: Simplification of Boolean Algebra and equations.		4	**Gravity:** Centre of Gravity, simple experiments stable, unstable and neutral equilibrium.	
4	**Estimation & Costing:-** Simple estimation of the requirement of materials etc. as applicable to the trade. Problems on estimation and costing. Calculating on the cost of repairing/reconditioning of an instrument.				