Syllabus for the subject

**of**

**WORKSHOP CALCULATION & SCIENCE**

(For 3rd & 4th semester)

**Under**

**CRAFTSMEN TRAINING SCHEME (CTS)**

For the trades of

**Under Group - A**

**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**

**SYLLABUS FOR WORKSHOP SCIENCE AND CALCULATION Code No. WSC- 3rdSem-Gr. A CTS-SEMESTER-III**

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **Workshop Calculation** | **Workshop Science** | **Total** |
| **No** |  |  | **Hrs.** |
|  |  |  | **42** |
| 1 | - Geometrical construction & theorem: | - Forces definition. |  |
|  | division of line segment, parallel lines, | - Compressive, tensile, shear forces and |  |
|  | similar angles, perpendicular lines, isosceles | simple problems. |  |
|  | triangleand right angled triangle. | -Stress,strain, ultimate strength, factor of |  |
|  |  | safety. |  |
|  |  | -Basic study of stress-strain curve for MS. |  |
| 2 | - Area of cut-out regular surfaces: circle and | - Temperature measuring instruments. |  |
|  | segment and sector of circle. | Specific heats of solids & liquids. |  |
| 3 | - Area of irregular surfaces. | - Thermal Conductivity, Heat loss and |  |
|  | - Application related to shop problems. | heat gain. |  |
| 4 | - Volume of cut-out solids: hollow cylinders, | - Average Velocity, Acceleration & |  |
|  | frustum of cone, block section. | Retardation. |  |
|  | - Volume of simple machine blocks. | - Related problems. |  |
| 5 | - Material weight and cost problems | - Circular Motion: Relation between |  |
|  | related to trade. | circular motion and Linear motion, |  |
|  |  | Centrifugal force, Centripetal force |  |
| 6 | - Finding the value of unknown sides and |  |  |
|  | angles of a triangle by Trigonometrical |  |  |
|  | method. |  |  |
|  |  |  |  |
| 7 | - Finding height and distance by |  |  |
|  | trigonometry. |  |  |

1. - Application of trigonometry in shop problems. (viz. taper angle calculation).

**SYLLABUS FOR WORKSHOP SCIENCE AND CALCULATION Code No. WSC- 4thSem-Gr. A CTS-SEMESTER-IV**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Topic** |  | **Workshop Calculation** | | **Workshop Science** | **Total** |
| **No** |  |  |  |  | **Hrs.** |
|  |  |  |  |  | **42** |
| 1 |  | **Graph:** |  | - Friction- co-efficient of friction, |  |
|  |  | - Read images, graphs, diagrams | | application and effects of friction in |  |
|  |  | Workshop practice. |  |
|  |  | – bar chart, pie chart. | |  |
|  |  |  |  |
|  |  | - Graphs: abscissa and ordinates, graphs of | | **Centre of gravity** and its practical |  |
|  |  | straight line, related to two sets of varying | | application. |  |
|  |  | quantities. | |  |  |
|  |  |  | |  |  |
| 2 |  | Simple problem on Statistics: | | - Magnetic substances- natural and |  |
|  |  | - Frequency distribution table | | artificial magnets. |  |
|  |  | - Calculation of Mean value. | | - Method of magnetization. Use of |  |
|  |  | - Examples on mass scale productions. | | magnets. |  |
|  |  | -Cumulative frequency | |  |  |
|  |  | -Arithmetic mean | |  |  |
| 3 |  | Acceptance of lot by sampling method | | - Electrical insulating materials. |  |
|  |  | (within specified limit size) with simple | | - Basic concept of earthing. |  |
|  |  | examples (not more than 20 samples). | |  |  |
|  |  |  |  |  |  |
| 4 |  |  |  | - Transmission of power by belt, |  |
|  |  |  |  | pulleys & gear drive. |  |
|  |  |  |  | - Calculation of Transmission of |  |
|  |  |  |  | power by belt pulley and gear drive. |  |
|  |  |  |  |  |  |
| 5 |  |  |  | - Heat treatment and advantages. |  |
| 6 |  |  |  | Concept of pressure – units of |  |
|  |  |  |  | pressure, atmospheric pressure, |  |
|  |  |  |  | absolute pressure, gauge pressure – |  |
|  |  |  |  | gauges used for measuring pressure |  |
| 7 |  |  |  | Introduction to pneumatics & |  |
|  |  |  |  | hydraulics systems. |  |