**Annexure – I**

**Details of Theory Syllabus**

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|  | **Topic** |
| 1. | Basic Electricity - Current, Voltage, Conductor, Insulator D.C., A.C., Resistance, Ohm’s Law, Voltmeter, Ammeter power & heating effect or current. |
| 2. | Use of Electricity as applied to welding - A.C. - D.C. types of Electric welding and application. |
| 3. | Principles of arc welding - necessity of welding machines types of machines - care and maintenance. |
| 4. | Arc - its formation & characteristics - arc length its effect and uses, advantages & dis-advantages. Polarity-types, uses. |
| 5. | Principles of arc welding - Use of welding fixture. |
| 6. | Arc blow definition, distortion in arc welding, causes & effects, methods of minimizing its effects. |
| 7. | Welding symbols - description and use, edge preparation-necessity - types on plate thickness. |
| 8. | Electrode - types, size, holder (description with sketch) LS. - 815-1974. Selection |
| 9. | Basic joint types **-** Butt **-** Flange **-** Butt (Pieces differing in thickness) |
|  | Lap, Corner, Tee, Slot and Plug Lap, Edge, Strapped, Spot - (Single spot - 3 Work pieces) - Sketches of all - Techniques of welding all the above cases, filet weld. |
| 10. | Advantages & disadvantages of Butt joint and Lap joint., Reading of Simple Drawings |
| 11. | Tables incorporating -  a) Rated current against Plate thickness.  b) Size of Electrode against Plate thickness. |
| 12. | Sequence of deposition - Single continuous pass - Back step sequence - Teehnique. |
| 13. | Single layer, Single pass - Multi layer, Multi pass, Basic patterns of weaving motion of electrode - Illustration with sketches - Weave beads - Normal bead (Stringer) - Zig - Zag motion, Looped motion. |
| 14. | Tools and Equipments required for Arc Welding - names - types - uses care & maintenance. |
| 15. | Welding machine - Generator, Transformer Set, Rectifier - 5 Funtions, Demonstration’s on welding set. |
| 16. | Safely in welding work & first aid knowledge. |
| 17. | Are welding defects - reasons and remedies. |
| 18. | Pipe and plate welding - difference - Sample Example. |
| 19. | Gas welding - types of fuel gases, Oxy - acetylene welding - types of flames and their uses. |
| 20. | Weldability and materials having good welding characteristics. |

**Detail of Practical Syllabus**

1. Training introduction - Recapitulations & Interaction with theory part learned / learning, Machinery used in the trade. Introduction to safety equipment and their uses. Setting up of Arc and Gas apparatus / machineries – Striking on Arc - adjustment of flame.

2. Operating generator, transformer and rectifier.

3. Marking out of M. S. Plate or flat, filing square to dimensions.

4. Edge chipping & cutting, Hack sawing, drilling.

5. Position F by Arc - Fusion run practice with / without filler rod. Straight line beads on M. S. plates 6/8/10 mm thick:

6. Butt weld square butt joint on M. S. Plate 6 & 8 mm -

Position F. Fillet weld Lap joint on M. S. Plate 3 mm position F.

7. Fillet weld Lap joint on M. S. Plate, M. S. Plate 5 mm position F. Butt weld in open square butt joint, M. S. Plate 5 mm, Position F. Butt weld single ‘Vee’ butt joint, M. S. Plate 10 mm position F (E).

8. Fusion run with filler rod on M. S. Plate at par with theory, Fillet weld ‘Tee’ joint on M. S. Plate 10 mm. position H (E). Butt weld single 15 ‘Vee’ joint on M. S. Plate 10 mm. position H (E).

9. Fillet weld inside corner joint. M. S. Plate 6-8 mm. Position H. Fusion run with filler weld Tee - joint M. S. Plate 10 mm. position ‘Vee’ (E)

10. Butt weld : Square butt joint. M. S. Plate 6 mm. position H.Fusion run with filler rod on M. S. Plate - 6 mm. position ‘V’.

11. Weaved bead on M. S. Plate - 6/8/10 mm. position F (E). Fillet weld open corner joint on M. S. Plate - 6/8/10 mm. position F (E). Fillet 1 Tee joint on M. S. Plate 10 mm. position F (E).

12. Butt weld / Single Vee butt joint -Grooved and fillet -M. S. Plate mm. position upward (E). Straight line beads on M. S. Plate 10 mm. position OH (E) - Tee joint in same manner.

13. Fillet weld Lap joint. M. S. Plate 6 mm. position ‘V’. Tee joint in same manner - 6 mm. plate - Fillet weld out side corner joint. M. S. Plate 6 mm. position ‘V’ (E).

14. Fillet Lap joint. M. S. Plate 10 mm. position OH (E). Butt weld single ‘V’ butt joint M. S. Plate 8 mm. position OH (E).

15. Fillet taper tray (plate M. S.), Elbow joints, Pipe joint - Tee pipe -equal & unequal pipes.

16. Tube or pipe welding fixing position - Their straight & corner joints -in fixed and rotating position.

17. Production jobs as per drawing such as furniture items.

18. Preparation of utility goods for domestic use by steel wire, preparation of different models with 5 mm. M. S. Rods or wire for common structural items - Grills, Gratings, Gates etc.

**Detail of Employability Skills Syllabus**

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| **Sl. No.** | **Content** | **Details** |
| 1. | English Literacy & Communication Skills | Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)  Transformation of sentences, Voice change, Change of tense, Spellings. Reading and understanding simple sentences about self, work and environment. Construction of simple sentences, Writing simple English.  Speaking with preparation on self, on family, on friends, classmates, on know, picture reading gain confidence through role-playing . Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.  Communication and its importance, Principles of Effective communication, Types of communication – verbal, non verbal, written, email, talking on phone. Non verbal communication –characteristics, components-Para-language,  Body – language,  Barriers to communication and dealing with barriers.  Handling nervousness/ discomfort.  Self awareness, Importance of Commitment, Ethics and Values, Ways to Motivate Oneself, Personal Goal setting and Employability Planning.  Manners, Etiquettes, Dress code for an interview, Do’s & Don’ts for an interview, Problem Solving, Confidence Building, Attitude. |
| 2. | I.T. Literacy | Introduction, Computer and its applications, Hardware andperipherals, Switching on-Starting and shutting down ofcomputer.  Basics of Operating System, WINDOWS, The user interfaceof Windows OS, Create, Copy, Move and delete Files andFolders, Use of External memory like pen drive, CD, DVDetc, Use of Common applications.  Basic operating of Word Processing, Creating, opening andclosing Documents, use of shortcuts, Creating and Editing ofText, Formatting the Text, Insertion & creation of Tables.Printing document.  Basics of Excel worksheet, understanding basic commands,creating simple worksheets, understanding sample worksheets,use of simple formulas and functions, Printing of simple excel sheets  Internet, Concept of Internet (Network of Networks),  Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internetusing Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication.  Information Security and antivirus tools, Do’s and Don’ts in Information Security, Awareness of IT – ACT, types of cyber crimes. |
| 3. | Entrepreneurship Skills | Entrepreneurship vs. management, Entrepreneurial motivation. Performance & Record, Role & Function of Entrepreneur, Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of PLC, Sales &distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.  Preparation of Project. Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.  Project formation, Feasibility, Legal formalities i.e.,Shop Act, Estimation & Costing, Investment procedure – Loan procurement – Banking Processes. |
|  | Productivity & Quality Tools | Definition, Necessity, Meaning of GDP.  Personal / Workman – Incentive, Production linked Bonus, Improvement in living standard. Industry Nation.  Skills, Working Aids, Automation, Environment, Motivation. How improves or slows down.  Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.  Meaning of quality, Quality characteristic. Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles.  Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.  Purpose of Housekeeping, Practice of good House keeping. Basic quality tools with a few examples |
|  | Occupational safety, health and Environment Education &Labour Welfare Legislation | Introduction to Occupational Safety and Health importance of safety and health at workplace. Basic Hazards, Chemical Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards.  Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.  Basic principles for protective equipment.  Accident Prevention techniques – control of accidents and safety measures.  Care of injured & Sick at the workplaces, First-Aid &Transportation of sick person.  Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen’s compensation Act. |