ATTENDANT OPERATOR DAIRY

COMPETENCY BASED CURRICULUM

(Duration: 2 Yrs.)

APPRENTICESHIP TRAINING SCHEME (ATS)

NSQF LEVEL- 5

SECTOR – AGRICULTURE AND ALLIED SERVICES

सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

Directorate General of Training

Skill India
कौशल भारत-कुशल भारत

ATTENDANT OPERATOR DAIRY

(Revised in 2018)

APPRENTICESHIP TRAINING SCHEME (ATS)

NSQF LEVEL - 5

Developed By

Ministry of Skill Development and Entrepreneurship
Directorate General of Training
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
EN-81, Sector-V, Salt Lake City,
Kolkata – 700 091

ACKNOWLEDGEMENT

The DGT sincerely expresses appreciation for the contribution of the Industry, State Directorate, Trade Experts and all others who contributed in revising the curriculum. Special acknowledgement to the following industries/organizations who have contributed valuable inputs in revising the curricula through their expert members:

Special acknowledgement is extended by DGT to the following expert members who had contributed immensely in this curriculum.

Co-ordinator for the course:

Sl. No.	Name & Designation Sh./Mr./Ms.	Organization	Expert Group Designation
1.	M J Daniel, Dairy Manager	Worli Dairy, Bombay – 18	Chairman
2.	M R Krishnamurthy, ADT	RDAT (WR), Bombay – 22	Secretary
3.	G Jana, Regional Director	RDAT (WR), Bombay – 22	Member
4.	Dr. B G Mokashi, Asst. Director (Animal Husbandry)	Regional Dy. Director of Animal Husbandry, Bombay	Member
5.	Dr. N S Tadpathrikar, Head, Dept. of Animal Production etc.	Bombay Veterinary College, Bombay – 12	Member
6.	U J Vaishnav, Asstt. Manager Service	Amul Dairy, Kaira Dist. Co-operative Milk Producers' Union Ltd., Anand – 1	Member
7.	A B Bhatt, Project Manager	National Dairy Development Board, Bombay – 20	Member
8.	M K Kawadkar, Trade Testing Officer	Directorate of Technical Training, Maharastra State	Member
9.	U R Hate, Asstt. Dairy Manager	Worli Dairy, Bombay – 18	Member

CONTENTS

1. BACKGROUND

1.1 Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate (ITI pass-outs) issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry**.** There are four categories of apprentices namely**; trade apprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by NCVT and those successful in the trade tests are awarded the National Apprenticeship Certificate.

The period of apprenticeship training for graduate (engineers), technician (diploma holders and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

1.2 Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger proportion of apprentices, will be critical to success; as will stronger collaboration between industry and the trainees to ensure the supply of skilled workforce and drive development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

1.3 Reformation

The Apprentices Act, 1961 has been amended and brought into effect from 22nd December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.
- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.
- Scope has been extended also to non-engineering occupations.
- Establishments have been permitted to outsource basic training in an institute of their choice.
- The burden of compliance on industry has been reduced significantly.

2. TRAINING SYSTEM

2.1 GENERAL

Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under aegis of National Council of Vocational Training (NCVT). Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) are two pioneer programmes of NCVT for propagating vocational training.

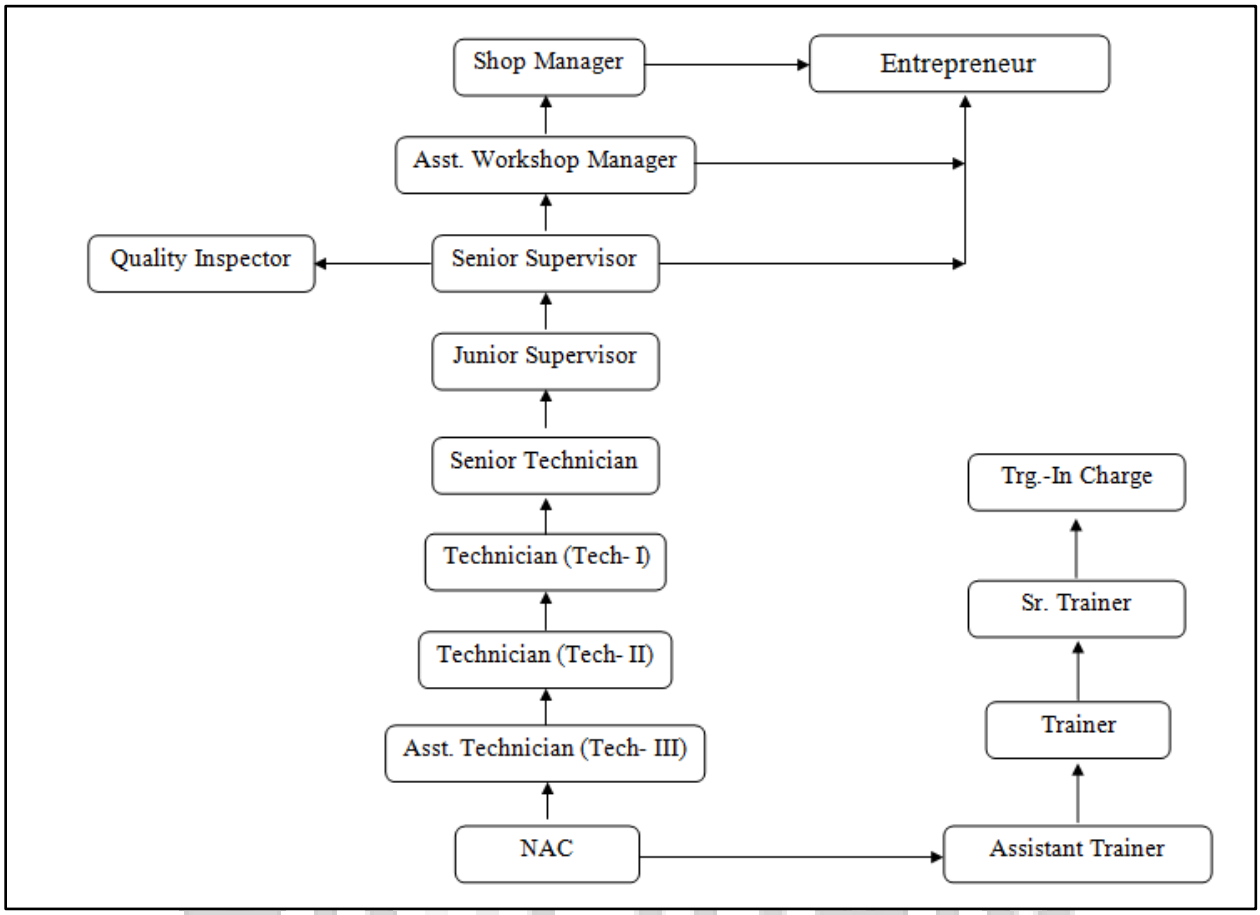
Attendant Operator Dairy trade under ATS is one of the most popular courses delivered nationwide through different industries. The course is of two years (02 Blocks) duration. It mainly consists of Domain area and Core area. In the Domain area Trade Theory & Practical impart professional - skills and knowledge, while Core area - Workshop Calculation and science, Engineering Drawing and Employability Skills imparts requisite core skills & knowledge and life skills. After passing out the training programme, the trainee is being awarded National Apprenticeship Certificate (NAC) by NCVT having worldwide recognition.

Broadly candidates need to demonstrate that they are able to:

- Read & interpret technical parameters/document, plan and organize work processes, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge, core skills & employability skills while performing jobs and solve problem during execution.
- Check the job/assembly as per drawing for functioning, identify and rectify errors in job/assembly.
- Document the technical parameters related to the task undertaken.

2.2 CAREER PROGRESSION PATHWAYS:

- Indicative pathways for vertical mobility.



2.3 COURSE STRUCTURE:

Table below depicts the distribution of training hours across various course elements during a period of two years (*Basic Training and On-Job Training*) : -

Total training duration details: -

Time (in months)	1-3	4-12	13-15	16-24
Basic Training	**Block– I**	-----	**Block – II**	------
Practical Training (On - job training)	----	**Block – I**	------	**Block – II**

A. Basic Training

For 02 yrs. Course (Engg) :-(**Total 06 months:** 03 months in 1st yr. + 03 months in 2nd yr.)

For 01 yr. course (Engg) :-(**Total 03 months:** 03 months in 1st yr.)

S No.	Course Element	Total Notional Training Hours	
		For 02 Yrs. course	**For 01 Yr. course**
1.	Professional Skill (Trade Practical)	550	275
2.	Professional Knowledge (Trade Theory)	240	120
3.	Workshop Calculation & Science	40	20
4.	Engineering Drawing	60	30
5.	Employability Skills	110	55
	Total (Including internal assessment)	**1000**	**500**

B. On-Job Training:-

For 02 yrs. Course (Engg) :-(**Total 18 months:** 09 months in 1st yr. + 09 months in 2nd yr.)

Notional Training Hours for On-Job Training: 3120 Hrs.

For 01 yr. course (Engg) :-(**Total 12 months**)

Notional Training Hours for On-Job Training: 2080 Hrs.

C. Total training hours:-

Duration	Basic Training	On-Job Training	Total
For 02 yrs. course (Engg)	1000 hrs.	3120 hrs.	4120 hrs.
For 01 yr. course (Engg)	500 hrs.	2080 hrs.	2580 hrs.

2.4 ASSESSMENT & CERTIFICATION:

The trainee will be tested for his skill, knowledge and attitude during the period of course and at the end of the training programme as notified by Govt of India from time to time. The Employability skills will be tested in first two semesters only.

a) The **Internal assessment** during the period of training will be done by **Formative assessment method** by testing for assessment criteria listed against learning outcomes. The training institute have to maintain individual *trainee portfolio* as detailed in assessment guideline. The marks of internal assessment will be as per the template (Annexure – II).

b) The final assessment will be in the form of summative assessment method. The All India Trade Test for awarding NAC will be conducted by NCVT on completion of course as per guideline of Govt of India. The pattern and marking structure is being notified by govt of India from time to time. **The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check** individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

The minimum pass percent for Practical is 60% & minimum pass percent for Theory subjects 40%. The candidate pass in each subject conducted under all India trade test.

2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking assessment. Due consideration should be given while assessing for team work, avoidance/reduction of scrap/wastage and disposal of scarp/wastage as per procedure, behavioral attitude, sensitivity to environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work

Evidences of internal assessments are to be preserved until forthcoming semester examination for audit and verification by examination body. The following marking pattern to be adopted while assessing:

Performance Level	Evidence
(a) Weightage in the range of 60 -75% to be allotted during assessment	
For performance in this grade, the candidate with occasional guidance and showing due regard for safety procedures	• Demonstration of good skill in the use of hand tools, machine tools and workshop

and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.	equipment • Below 70% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A fairly good level of neatness and consistency in the finish • Occasional support in completing the project/job.
(b) Weightage in the range of above75% - 90% to be allotted during assessment	
For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship.	• Good skill levels in the use of hand tools, machine tools and workshop equipment • 70-80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A good level of neatness and consistency in the finish • Little support in completing the project/job
(c) Weightage in the range of above 90% to be allotted during assessment	
For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	• High skill levels in the use of hand tools, machine tools and workshop equipment • Above 80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.

3. JOB ROLE

Brief description of Job roles:

Dairy Worker, General performs all or several tasks in preparation of various dairy products. Pasteurizes raw milk or other dairy product to remove harmful bacteria. Develops bacterial culture for use in making butter, buttermilk, cheese and other products. Separates cream from milk and churns it into butter. Curdles milk and converts curds into cheese. May make ice-cream.

Separator Man; Cream Separator; Cream man (Dairy) operates milk separator to separate cream from milk. Assembles and adjusts separator as necessary, according to type of product for which separated cream or milk is to be used; places empty containers below cream and skimmed outlets; pours milk into separator; switches on centrifugal machine which automatically carries milk into bowl and separates milk into fat and skimmed milk; regulates separator to obtain required percentage of cream for making butter or ghee; cleans plant using hot water, soda and other detergent solutions. May also attend to pasteurizing plant.

Butter Maker performs all or several tasks for making butter. Pasteurizes milk to eliminate harmful bacteria. Separates cream from milk in centrifuge. Adds lactic ferment to ripen cream. Pours or pumps cream into mechanical churn. Starts churn to make butter, controlling butter moisture, temperature and time of churning. May add salt to butter in churn. My take samples of butter for testing. May boil and strain butter to make 'ghee' and be designated as GHEE MAKER.

Cheese Maker cooks milk and specified ingredients to make cheese according to formula. Pasteurizes and separates milk to obtain prescribed butter fat content; turns valves to fill vat with milk and heat milk to specified temperature; starts agitator to mix ingredients; tests samples of milk for acidity and allows agitator to mix ingredients until specified level of acidity is reached; dumps and mixes measured amount of rennet into milk; stops agitator to allow milk to coagulate into curd; cuts curd or separates curd with hand scoop to release whey (watery part); observes thermometer, adjusts steam valve, and starts agitator to stir and cook curd at prescribed temperature for specified time; squeezes and stretches sample of curd with figures and extends cooking time to achieve desired firmness or texture; scoops curd into burlap containers to drain off excess moisture; places cheese in moulds and presses it into shape. May salt cheese by immersing them in brine or roll cheese in dry salt, pierce or smear cheese with cultured wash to develop mould growth, and place or turn cheese blocks on shelves to cure cheese. May supervise ripening of cheese. May specialize in making particular type of cheese. May Pasteurize milk and operate centrifugal machine to separate cream out of pure milk.

Ice-Cream Maker makes ice-cream by mixing milk, sugar and other ingredients and by freezing mixture in freezing machine. Measures and mixes ingredients according to recipe; pasteurizes mixture to eliminate harmful bacteria; pumps ingredients through a homogenizer to break-down butter-fat globules; pours mixture into freezing machine; starts machine to stir and cool mixture; unloads machine when ice-cream of required consistency is obtained; cleans and sterilizes machines, and other equipment with hot water. May form ice-cream into special shapes. May operate ice-block washing machine.

Dairy Products Makers, Others Dairy Workers (non-farm), Other include all other dairy workers not elsewhere classified, for example, those salting cheese by immersing them in brine or by rubbing them with dry salt, sterilizing milk; operating machines which homogenize milk, moulding butter or cheese into shape, packing and wrapping butter with paper, making condensed or powdered milk, etc. and may be designated according to nature of work performed.

Pasteurizing Plant Operator; Pasteurizer (Dairy) operates pasteurizing plant to remove harmful bacteria from raw milk and other dairy products. Pumps cold raw milk or other dairy products through a heating tank; maintains liquid at required temperature for a specified time and pumps it through cooling unit into bottling machine; checks thermometers and gauges and makes necessary adjustments to ensure that liquid is properly pasteurized; cleans and sterilizes tanks and inter-connecting pipes; disconnects filter and renew or cleans straining devices. May drain out pasteurized milk into container through tap fitted in plant.

Mixing Tank Operator tends mixing tank to mix skimmed milk powder and water to form toned milk. Opens taps to admit specified quantity of water into tank as indicated by meter; measures required quantity of milk powder and adds it into tank; switches on machine which churns and mixes powder and water into milk; tests sample to ensure conformity to specification, using testing apparatus; empties tank, cleans and sterilizes equipment.

Reference NCO-2015:

(i) 7513.0100-Dairy Worker, General
(ii) 7513.0200-Separator Man
(iii) 7513.0300-Butter Maker
(iv) 7513.0400-Cheese Maker
(v) 7513.0500-Ice-Cream Maker
(vi) 7513.9900-Dairy Products Makers, Others
(vii) 8160.0300-Pasteurising Plant Operator (Dairy)
(viii) 8160.0400-Mixing Tank Operator

4. NSQF LEVEL COMPLIANCE

NSQF level for Attendant Operator Dairy trade under ATS: **Level 5**

As per notification issued by Govt. of India dated- 27.12.2013 on National Skill Qualification Framework total 10 (Ten) Levels are defined.

Each level of the NSQF is associated with a set of descriptors made up of five outcome statements, which describe in general terms, the minimum knowledge, skills and attributes that a learner needs to acquire in order to be certified for that level.

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are:

a. Process
b. professional knowledge,
c. professional skill,
d. core skill and
e. Responsibility.

The Broad Learning outcome of Attendant Operator Dairy trade under ATS mostly matches with the Level descriptor at Level- 5.

The NSQF level-5 descriptor is given below:

Level	Process Required	Professional Knowledge	Professional Skill	Core Skill	Responsibility
Level 5	Job that requires well developed skill, with clear choice of procedures in familiar context.	Knowledge of facts, principles, processes and general concepts, in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problem by selecting and applying basic methods, tools, materials and information.	Desired mathematical skill, understanding of social, political and some skill of collecting and organizing information, communication.	Responsibility for own work and Learning and some responsibility for other's works and learning.

5. GENERAL INFORMATION

Name of the Trade	ATTENDANT OPERATOR DAIRY
NCO - 2015	7513.0100, 7513.0200, 7513.0300, 7513.0400, 7513.0500, 7513.9900, 8160.0300, 8160.0400
NSQF Level	Level – 5
Duration of Apprenticeship Training (Basic Training + On-Job Training)	Two years (02 Blocks each of one year duration).
Duration of Basic Training	a) Block –I : 3 months b) Block – II : 3 months **Total duration of Basic Training: 6 months**
Duration of On-Job Training	a) Block– I: 9 months b) Block–II : 9 months **Total duration of Practical Training: 18 months**
Entry Qualification	Passed 10th class examination under 10+2 system of education with Science and Mathematics or its equivalent.
Selection of Apprenticeship	The apprentices will be selected as per Apprenticeship Act amended time to time.
Instructors Qualification for Basic Training	As per ITI instructors qualifications as amended time to time for the specific trade.
Infrastructure for Basic Training	As per related Trade of ITI
Examination	The internal examination/ assessment will be held on completion of each block. Final examination for all subjects will be held at the end of course and same will be conducted by NCVT.
Rebate to Ex-ITI Trainees	----N/A---
CTS trades eligible for Attendant Operator Dairy Apprenticeship	----N/A---

Note:

- *Industry may impart training as per above time schedule for different block, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspects is compromised.*
- *For imparting Basic Training the industry to tie-up with ITIs having such specific trade and affiliated to NCVT.*

6. LEARNING OUTCOME

6.1 GENERIC LEARNING OUTCOME

The following are minimum broad Common Occupational Skills/Generic Learning Outcome after completion of the Attendant Operator Dairy course of 02 years duration under ATS.

Block I & II

1. Recognize & comply safe working practices, environment regulation and housekeeping.
2. Understand and explain different mathematical calculation & science in the field of study. *[Different mathematical calculation & science – Conversion of Units, Percentage, & Mensuration-Area & Volume of different surfaces and solids, and Properties of materials, Ferrous & non-ferrous metals, Mass, Weight, Density etc.].*
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical figures like Triangles, Square, Rectangle, Rhombus, Parallelogram, Circle etc., Lettering & Numbering, Freehand sketching of Hand tools used for Attendant Operator Dairy / Wireman / Electrician/ trade & wire joints, Signs & symbols for Electrical components used in electrical circuits, Schematic diagram of plate and pipe earthing, insulators used in over head line, Layout diagram of a substation, Free hand sketches of various equipments.].*
4. Select and ascertain measuring instrument and measure dimension of components and record data.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.
8. Plan and organize the work related to the occupation.

6.2 SPECIFIC LEARNING OUTCOME

Block – I

1. Study in detail about normal process including sequential and smooth start up and shut down procedures. Plan and use fitters hand tools used for chipping, filling, drilling and threading.
2. Fit parts together in set order using nuts, bolts, screws and pins etc. with necessary wrenches, spanners and other special tools.

3. Operate & maintain Dairy processing equipments like various types of valves, gaskets, pipes, tanks, pressure vessels etc.
4. Carry out joints for various pipes that are required for transferring milk from one place to another.
5. Fits pipe with vessels. Conduct simple fitting work.
6. Operate and maintain simple equipments/machineries used in Dairy industry.
7. Know the use of various types of cans.
8. Know methods of washing cans using both automatic and manual machines.
9. Handle milk from cans to tank, Milk sampling, cleaning and washing methods of can, Tankers etc.
10. Know the use of conveyor system used in industry.
11. Know the Ingredients of milk.
12. Know use of testing equipments for milk.
13. Know the functions of Lactometer and other instruments.
14. Know pasteurization process, homogenization, standardization, reconstitution and recombination.
15. Operate and maintain milk powder making machinery.
16. Use of cold stores & air pressure, use of refrigeration units and related equipments.
17. Repair of pipe lines and water pumps etc.
18. Operation, upkeep and maintenance of silos and pumps, water pumps study of liquid milk and its conversion into powder form.
19. Practical work on milk and milk products, handling and ancillary operation connect thereto.

Block – II

20. Know the use of milk in making of butter, ghee, powder, cheese, chocolate etc.
21. Carry out Gassing, soldering of tins, etc. with use of gassing and soldering equipments.
22. Study of pasteurization cycle.
23. Know the process to churn cream; handle butter milk, washing and sterilize equipments and use of detergent.
24. Storage of milk and milk products, Handle and process milk, Repair machineries connecting milk and milk products.
25. Know the use of tanker for handling.
26. Add color and other chemical substance in processing of milk and milk products.
27. Know about various packing materials and paper pack for butter, tins-small and big etc.
28. Process of mixing ingredients in cheese making.
29. Automatic processes of packing of milk and milk products. Pack milk powder and other products.

30. Manufacture and mould chocolate and other confectionary products using milk products.
31. Use temperature instruments and the process of reading those.

Note: *Learning outcomes are reflection of total competencies of a trainee and assessment will be carried out as per assessment criteria.*

7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING OUTCOME	
LEARNING OUTCOMES	**ASSESSMENT CRITERIA**
1. Recognize & comply safe working practices, environment regulation and housekeeping.	1.1 Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements.
	1.2 Recognize and report all unsafe situations according to site policy.
	1.3 Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	1.4 Identify, handle and store / dispose off dangerous/unsalvageable goods and substances according to site policy and procedures following safety regulations and requirements.
	1.5 Identify and observe site policies and procedures in regard to illness or accident.
	1.6 Identify safety alarms accurately.
	1.7 Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	1.8 Identify and observe site evacuation procedures according to site policy.
	1.9 Identify Personal Productive Equipment (PPE) and use the same as per related working environment.
	1.10 Identify basic first aid and use them under different circumstances.
	1.11 Identify different fire extinguisher and use the same as per requirement.
	1.12 Identify environmental pollution & contribute to avoidance of same.
	1.13 Take opportunities to use energy and materials in an environmentally friendly manner
	1.14 Avoid waste and dispose waste as per procedure
	1.15 Recognize different components of 5S and apply the same in the working environment.
2. Understand and explain different mathematical calculation & science in the field of study. *[Different*	2.1 Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat & temperature, force, motion, pressure, heat treatment, centre of gravity, friction.

mathematical calculation & science – Conversion of Units, Percentage, & Mensuration-Area & Volume of different surfaces and solids, and Properties of materials, Ferrous & non-ferrous metals, Mass, weight, Density etc.].	2.2 Measure dimensions as per drawing.
	2.3 Use scale/ tapes to measure for fitting to specification.
	2.4 Comply with given tolerance.
	2.5 Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.
	2.6 Ensure dimensional accuracy of assembly by using different instruments/gauges.
	2.7 Explain basic electricity, insulation & earthing, Different types of flow, viscosity, Reynolds's number.
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical figures like Triangles, Square, Rectangle, Rhombus, Parallelogram, Circle etc., Lettering & Numbering, Freehand sketching of Hand tools used for Attendant Operator Dairy / Wireman / Electrician/ trade & wire joints, Signs & symbols for Electrical components used in electrical circuits, Schematic diagram of plate and pipe earthing, insulators used in over head line, Layout diagram of a substation, Free hand sketches of various equipments.].*	3.1 Read & interpret the information on drawings and apply in executing practical work.
	3.2 Read & analyse the specification to ascertain the material requirement, tools, and machining /assembly /maintenance parameters.
	3.3 Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.
	3.4 Read & interpret the signs and symbols for electrical components and AC/DC systems.
	3.5 Encounter drawings with electrical circuit diagrams and layout diagrams.
4. Select and ascertain measuring instrument and measure dimension of components and record data.	4.1 Select appropriate measuring instruments such as Ammeter, voltmeter, meggar, earth tester etc. (as per tool list).
	4.2 Ascertain the functionality & correctness of the instrument.
	4.3 Measure dimension of the components & record data to analyse them with given drawing/measurement.
5. Explain the concept in	5.1 Explain the concept of productivity and quality tools

productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	and apply during execution of job.
	5.2 Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.
	5.3 Knows benefits guaranteed under various acts.
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	6.1 Explain the concept of energy conservation, global warming, pollution and utilize the available recourses optimally & remain sensitive to avoid environment pollution.
	6.2 Dispose waste following standard procedure.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	7.1 Explain personnel finance and entrepreneurship.
	7.2 Explain 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.
	7.3 Prepare Project report to become an entrepreneur for submission to financial institutions.
8. Plan and organize the work related to the occupation.	8.1 Use documents, drawings and recognize hazards in the work site.
	8.2 Plan workplace/ assembly location with due consideration to operational stipulation
	8.3 Communicate effectively with others and plan project tasks
	8.4 Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same.
SPECIFIC OUTCOME	
Block-I & II (Section:10 in the competency based curriculum)	
*Assessment Criteria i.e. the standard of performance, for each specific learning outcome mentioned under **block – I & block – II** (section: 10) must ensure that the trainee achieves well developed skill with clear choice of procedure in familiar context. Assessment criteria should broadly cover the aspect of **Planning** (Identify, ascertain, estimate etc.); **Execution** perform, illustration, demonstration etc. by applying 1) a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information 2) Knowledge of facts, principles, processes, and general concepts, in a field of work or study 3)Desired Mathematical Skills and some skill of collecting and organizing information, communication) and **Checking / Testing** to ensure functionality during the assessment of each outcome. The assessments parameters must also ascertain that the candidate is responsible for own work and learning and some responsibility for other's work and learning.*	

8. SYLLABUS

BASIC TRAINING (Block – I)

Duration: (03) Three Months

Week No.	Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
1.	Familiarization with dairy industry, importance of trade training machinery used in the trade, type of work done by trainees in the dairy, type of jobs made by the trainees in the trade. Introduction to safety including fire fighting equipment & their uses etc.	Importance of safety and general precautions observed in the industry. Importance of the trade in the development of industrial economy of country recreational and medical facilities and other extracurricular activities of the institute.
2.	Importance to the cleanliness and hygiene with specific reference to milk and milk products. Clean and maintain the cleanliness of the work area using approved sanitizers and keep it free from dust, waste, flies and pests.	Importance to the cleanliness and hygiene, precautions observed in the institute and in the section
3.	Use of fitters hand tools, chipping, filling, drilling and threading. Use of nails, screws, spanners etc.	Introduction of various types of fitters hand tools and their uses. Introduction of various types of nails, screws, spanners etc.
4.	Use of various types of valves. Use of various types of gaskets. Use of various type of pipes. Joints for various pipes. Assemble fittings, valves, bowls, strainers and other parts of equipment to prepare for production.	Introduction to various types of valves. Introduction to various types of gaskets. Introduction to various types of pipes. Different types of joints for pipe fittings.
5.	Use of Fitter hand tools and their care and maintenance.	Introduction to types and uses of simple equipments used for machinery such as hand tools and machine tools. Preventive maintenance of simple equipments, corrective maintenance of simple equipments.
6.	Use of various type of tanks, pressure vessels etc. Fitting of pipe with vessels. Turn valves to pump sterilizing solution and rinse by passing water through pipes to sterilize equipments.	Introduction to various types of tanks, pressure vessels. Introduction to fitting of pipes with vessels.
7.	Simple fitting work. Use of various types of cans.	Introduction of simple fitting work. Introduction to various types of cans.

8.	To know automatic methods of can washing. To know manual methods of can washing.	Introduction to automatic methods of can washing. Introduction to manual methods of can washing.
9.	Handling of milk from can to tank. Cleaning and washing methods of tankers etc. Turn valves to admit steam into pipes of the pasteurizer	Introduction of handling of milk from can to tank. Instructions regarding all types of tankers etc. & various types of cleaning them.
10.	Use of conveyor system.	Types and uses of conveyor system.
11.	Milk sampling. Ingredients of milk.	What is milk sampling, density of milk etc. Introduction to testing equipment for milk.
12.	To know use of testing equipments for milk, functions of Lactometer and other instruments. Attend minor repairs/faults of all machines (if any)	Introduction to testing equipments for milk.
13.	**Assessment/Examination 03days**	

Note: - *More emphasis to be given on video/real-life pictures during theoretical classes. Some real-life pictures/videos of related industry operations may be shown to the trainees to give a feel of Industry and their future assignment.*

BASIC TRAINING (Block – II)

Duration: (03) Three Months

Week No.	Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
1-3	To know Pasteurization process, homogenization, standardization, reconstitution and recombination.	What is pasteurization process, types of heating systems in pasteurization (H.T.S.T), operation of pasteurizers, cleaning & maintenance of the pasteurizers.
4-5	To know the use of power making machinery.	Process of milk condensing, process of drying milk condensing equipments, drying equipments.
6	Use of air pressure required for pasteurisation, homogenisation, standardization, reconstitution and recombination.	Uses of air pressure in instrumentation and equipments.
7	Use of cold stores. Set process parameters of the chilling tank like temperature, time etc. Circulate refrigerant and pre-cooled water through coils to cool milk.	Roll of cold store for preservation of milk and milk products.
8	Use of refrigeration units and related equipments.	Use of refrigeration in dairy industry.
9	Repair of pipe lines and water pumps.	Instructions regarding repairing work of pipe lines and pumps.
10	Upkeep and maintenance of silos and pumps. Ensure periodic maintenance of all machines and equipment following the SOP or suppliers instructions/manuals.	Introduction to upkeep & maintenance of silos and pumps.
11	Processing liquid milk into other products like butter, cheese, milk powder, ice-cream, chocolates etc.	Various processes of milk conversion into products.
12	Practical work on milk products handling and ancillary operations connected thereto.	
13	**Assessment/Examination 03 days**	

Note: -*More emphasis to be given on video/real-life pictures during theoretical classes. Some real-life pictures/videos of related industry operations may be shown to the trainees to give a feel of Industry and their future assignment.*

9. SYLLABUS - CORE SKILLS

9.1 WORKSHOP CALCULATION SCIENCE & ENGINEERING DRAWING

Block – I		
Sl. No.	**Workshop Calculation and Science (Duration: - 20 hrs.)**	**Engineering Drawing (Duration: - 30 hrs.)**
1.	**Unit**: Systems of unit- CGS, MKS/SI unit, unit of length, Mass and time, Conversion of units **Material Science** : Properties -Physical & Mechanical, Types –Ferrous & Non-Ferrous, difference between Ferrous and non-Ferrous metals	**Engineering Drawing: Introduction and its importance** - Viewing of engineering drawing sheets. Method of Folding of printed Drawing Sheet as per BIS SP:46-2003
2.	**Fractions**: Fractions, Decimal fraction, Addition, Subtraction, Multiplication and Division of Fractions and Decimals, conversion of Fraction to Decimal and vice versa. Simple problems using Calculator	**Drawing Instruments : their uses** Drawing board, T-Square, Drafter (Drafting M/c), Set Squares, Protractor, Drawing Instrument Box (Compass, Dividers, Scale, Diagonal Scales etc.), Pencils of different Grades, Drawing pins / Clips.
3.	**Properties of Material** : properties - Physical & Mechanical, Types –Ferrous & Non-Ferrous, difference between Ferrous and Non-Ferrous metals, introduction of Iron, Cast Iron, Wrought Iron, Steel, difference between Iron and Steel, Alloy steel, carbon steel, stainless steel, Non-Ferrous Alloys.	**Lines :** - Definition, types and applications in Drawing as per BIS SP:46-2003 - Classification of lines (Hidden, centre, construction, Extension, Dimension, Section) - Drawing lines of given length (Straight, curved) - Drawing of parallel lines, perpendicular line Methods of Division of line segment
4.	**Average :** Problems of Average. **Ratio &Proportion** : Simple calculation on related problems.	**Dimensioning:** - Definition, types and methods of dimensioning (functional, non-functional and auxiliary) - Types of arrowhead - Leader Line with text - Position of dimensioning (unidirectional, aligned, oblique as per BIS SP:46-2003) - Symbols preceding the value of dimension and dimensional tolerance.
5.	**Mass, Weight and Density**: Mass, Unit of Mass, Weight, difference	**Free hand drawing of** - Lines, polygons, ellipse, etc.

	between mass and weight, Density, unit of density.	- geometrical figures and blocks with dimension Transferring measurement from the given object to the free hand sketches.
6.	**Percentage**: Introduction, Simple calculation. Changing percentage to decimal and fraction and vice-versa.	**Symbolic Representation (as per BIS SP:46-2003) of :** - Fastener (Rivets, Bolts and Nuts) - Bars and profile sections - Weld, brazed and soldered joints. - Electrical and electronics element - Piping joints and fittings.
7.	- Forces definition. - Definition and example of compressive, tensile, shear forces, axial and tangential forces. Stress, strain, ultimate strength, factor of safety for MS. **Speed and Velocity**: Rest and motion, speed, velocity, difference between speed and velocity, acceleration, retardation.	Free hand sketches of hand tools and of different types of valves, gaskets, pipes and pipe fittings.
8.	**Mensuration:** Area and perimeter of square, rectangle, parallelogram, triangle, circle, semi circle. Volume of solids – cube, cuboids, cylinder and Sphere. Surface area of solids – cube, cuboids, cylinder and Sphere. - Area of cut-out regular surfaces: circle and segment and sector of circle. - Volume of cut-out solids: hollow cylinders, frustum of cone, block section. - Volume of simple solid blocks.	Free hand sketch of all types of nails, screws, spanners etc..
9.	**Algebra** : Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables). - Circular Motion: Relation between circular motion and Linear motion, Centrifugal force, Centripetal force.	Free hand sketch of all types of fitters hand tools viz. various types of nails, screws, spanners etc.
10.	**Work, Power and Energy**: work, unit of work, power, unit of power, Horse	Free hand sketches of various tanks and pressure vessels used in Dairy industry.

	power, mechanical efficiency, energy, use of energy, potential and kinetic energy, examples of potential energy and kinetic energy.	
Block – II		
Sl. No.	**Workshop Calculation and Science (Duration: - 20 hrs.)**	**Engineering Drawing (Duration: - 30 hrs.)**
1.	**Friction** and its application in Workshop practice.	- Machined components; concept of fillet & chamfer; surface finish symbols. - Screw thread, their standard forms as per BIS, external and internal thread, conventions on the features for drawing as per BIS.
2.	**Heat & Temperature**: Heat and temperature, their units, difference between heat and temperature, boiling point, melting point, scale of temperature, relation between different scale of temperature, Thermometer, pyrometer, transmission of heat, conduction, convection, radiation.	Free hand sketches of various types of cans.
3.	**Basic Electricity**: Introduction, use of electricity, Types of current_ AC, DC, their comparison, voltage, resistance, their units. Conductor, insulator, Types of connections – series, parallel, electric power, Horse power, energy, unit of electrical energy. Concept of earthing.	- Reading & interpretation of assembly drawing and detailing.
4.	**Heat treatment** – Necessity, different common types of Heat treatment.	Free hand sketches of equipments.
5.	**Graph:** - Read images, graphs, diagrams bar chart, pie chart. - Graphs: abscissa and ordinates, graphs of straight line, related to two sets of varying quantities.	- Reading of drawing. Simple exercises related to missing lines, dimensions and views. How to make queries.
6.	**Transmission of power:** By belt, pulleys & gear drive.	Free hand sketch of different types of condensing & drying equipments.
7.	**Concept of pressure** – units of pressure, atmospheric pressure, gauge pressure – gauges used for measuring pressure**.** **Introduction to pneumatics & hydraulics systems.** Solution of NCVT test papers	- Simple exercises related to trade related symbols. - Solution of NCVT test papers.

9.2 EMPLOYABILITY SKILLS

(DURATION: - 110 HRS.)

Block – I (Duration – 55 hrs.)	
1. English Literacy	Duration : 20 Hrs. Marks : 09
Pronunciation	Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)
Functional Grammar	Transformation of sentences, Voice change, Change of tense, Spellings.
Reading	Reading and understanding simple sentences about self, work and environment
Writing	Construction of simple sentences Writing simple English
Speaking / Spoken English	Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Cardinal (fundamental) numbers ordinal numbers. 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.
2. I.T. Literacy	Duration : 20 Hrs. Marks : 09
Basics of Computer	Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.
Computer Operating System	Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications.
Word processing and Worksheet	Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, 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.

Computer Networking and Internet	Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internet using 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. Communication Skills	Duration : 15 Hrs. Marks : 07
Introduction to Communication Skills	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.
Listening Skills	Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening. Triple- A Listening - Attitude, Attention & Adjustment. Active Listening Skills.
Motivational Training	Characteristics Essential to Achieving Success. The Power of Positive Attitude. Self awareness Importance of Commitment Ethics and Values Ways to Motivate Oneself Personal Goal setting and Employability Planning.
Facing Interviews	Manners, Etiquettes, Dress code for an interview Do's & Don'ts for an interview.
Behavioral Skills	Problem Solving Confidence Building Attitude
Block – II	

Duration – 55 hrs.		
4. Entrepreneurship Skills		Duration : 15 Hrs. Marks : 06
Concept of Entrepreneurship	Entrepreneur - Entrepreneurship - Enterprises:-Conceptual issue Entrepreneurship vs. management, Entrepreneurial motivation. Performance & Record, Role & Function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.	
Project Preparation & Marketing analysis	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.	
Institutions Support	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.	
Investment Procurement	Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.	
5. Productivity		Duration : 10 Hrs. Marks : 05
Benefits	Personal / Workman - Incentive, Production linked Bonus, Improvement in living standard.	
Affecting Factors	Skills, Working Aids, Automation, Environment, Motivation - How improves or slows down.	
Comparison with developed countries	Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.	
Personal Finance Management	Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.	
6. Occupational Safety, Health and Environment Education		Duration : 15 Hrs. Marks : 06
Safety & Health	Introduction to Occupational Safety and Health importance of safety and health at workplace.	

Occupational Hazards	Basic Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.
Accident & safety	Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.
First Aid	Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person.
Basic Provisions	Idea of basic provision legislation of India. safety, health, welfare under legislative of India.
Ecosystem	Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.
Pollution	Pollution and pollutants including liquid, gaseous, solid and hazardous waste.
Energy Conservation	Conservation of Energy, re-use and recycle.
Global warming	Global warming, climate change and Ozone layer depletion.
Ground Water	Hydrological cycle, ground and surface water, Conservation and Harvesting of water.
Environment	Right attitude towards environment, Maintenance of in -house environment.
7. Labour Welfare Legislation	Duration : 05 Hrs. Marks : 03
Welfare Acts	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.
8. Quality Tools	Duration : 10 Hrs. Marks : 05
Quality Consciousness	Meaning of quality, Quality characteristic.
Quality Circles	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.
Quality Management System	Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.
House Keeping	Purpose of House-keeping, Practice of good Housekeeping.
Quality Tools	Basic quality tools with a few examples.

10. DETAILS OF COMPETENCIES (ON-JOB TRAINING)

The **competencies/ specific outcomes** on completion of On-Job Training are detailed below: -

Block – I

1. Study in detail about normal process including sequential and smooth start up and shut down procedures. Plan and use fitters hand tools used for chipping, filling, drilling and threading.
2. Fit parts together in set order using nuts, bolts, screws and pins etc. with necessary wrenches, spanners and other special tools.
3. Operate & maintain Dairy processing equipments like various types of valves, gaskets, pipes, tanks, pressure vessels etc.
4. Carry out joints for various pipes that are required for transferring milk from one place to another.
5. Fits pipe with vessels. Conduct simple fitting work.
6. Operate and maintain simple equipments/machineries used in Dairy industry.
7. Know the use of various types of cans.
8. Know methods of washing cans using both automatic and manual machines.
9. Handle milk from cans to tank, Milk sampling, cleaning and washing methods of can, Tankers etc.
10. Know the use of conveyor system used in industry.
11. Know the Ingredients of milk.
12. Know use of testing equipments for milk.
13. Know the functions of Lactometer and other instruments.
14. Know pasteurization process, homogenization, standardization, reconstitution and recombination.
15. Operate and maintain milk powder making machinery.
16. Use of cold stores & air pressure, use of refrigeration units and related equipments.
17. Repair of pipe lines and water pumps etc.
18. Operation, upkeep and maintenance of silos and pumps, water pumps study of liquid milk and its conversion into powder form.
19. Practical work on milk and milk products, handling and ancillary operation connect thereto.

Block – II

20. Know the use of milk in making of butter, ghee, powder, cheese, chocolate etc.
21. Carry out Gassing, soldering of tins, etc. with use of gassing and soldering equipments.
22. Study of pasteurization cycle.

23. Know the process to churn cream; handle butter milk, washing and sterilize equipments and use of detergent.
24. Storage of milk and milk products, Handle and process milk, Repair machineries connecting milk and milk products.
25. Know the use of tanker for handling.
26. Add color and other chemical substance in processing of milk and milk products.
27. Know about various packing materials and paper pack for butter, tins-small and big etc.
28. Process of mixing ingredients in cheese making.
29. Automatic processes of packing of milk and milk products. Pack milk powder and other products.
30. Manufacture and mould chocolate and other confectionary products using milk products.
31. Use temperature instruments and the process of reading those.

Note:

1. Industry must ensure that above mentioned competencies are achieved by the trainees during their on job training.
2. In addition to above competencies/ outcomes industry may impart additional training relevant to the specific industry.

ANNEXURE – I

INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

ATTENDANT OPERATOR DAIRY			
LIST OF TOOLS AND EQUIPMENT for Basic Training			
A. TRAINEES TOOL KIT			
Sl. no.	**Name of the Tool &Equipments**	**Specification**	**Quantity**
1.	Caliper outside spring	6”/150 mm.	1 No.
2.	Caliper outside spring	6”/150 mm.	1 No.
3.	Dividers spring	6”/150 mm.	1 No.
4.	Hammer ball pein	1 lb. Handled	1 No.
5.	Hand drilling machine	0” to 20 C.P	1 No.
6.	Rule steel	12”/300 mm. English and metric	1 No.
7.	Screw driver	12’ × $\frac{1}{2}$” blade/ 300 ×10mm.	1 No.
8.	Safety goggles		1 No.
9.	Hacksaw frame adjustable	For 8” to 12” blades / 200 to 300 mm.	1 No.
10.	Work bench	6’ ×3 $\frac{1}{2}$" × 2 $\frac{1}{2}$" width 4 vices 5’ jaws 2m. × 15m. × 750m.	1 No. (For 4 apprs.)
11.	Almirah	6’×4’×18’	1 No.
12.	Taps and dies complete set	in box B.A., B.S.F., B.S.W., American and metric	1 Set each.
13.	File flat	12” bastard/300mm.	1 No.
14.	File flat	10” second cut /250 mm.	1 No.
15.	Pipe Wrench Stillson pattern	18” long/450 mm.	1 No.
16.	Chain wrench	3” pipe/150 mm.	1 No.
17.	Plier	Combination 8”/200mm.	1 No.
18.	Double ended spanners set of wit worth sizes	From 1/8” × 3/16” to *c* ×9/16”	1 Set.
19.	Double ended spanners set of metric size	8 × 9 to 20 × 22	1 Set.
20.	Double offset double ended ring spanners set of 7 witworth sizes	From 1/8” × 3/16” to $\frac{1}{2}$” ×9/16”	1 Set.
21.	Socket set	$\frac{1}{2}$” drive, 3/8’ to 1-1/4” with ratchet handle	1 Set.
22.	Steel tape	10 ft. In case	1 No.
23.	Pipe cutter	3 wheel type, 3” pipe / 75 mm	1 No.
24.	Pipe die set complete with die stock	from 1/8” to 1” dia.	1 No.

	and bushing for pipes		
25.	Pipe vice	3”/75 mm.	1 No.
26.	File half round 2nd cut	8”/200 mm.	1 No.
27.	File round 8” 2nd cut	8”/200 mm.	1 No.
28.	Centre punch	6”/150 mm.	1 No.
29.	Chisel cold flat	1”/25 mm.	1 No.
30.	Square Engineers	6”/150 mm.	1 No.
31.	Pipe Bending spring	$\frac{1}{2}$” to $\frac{3}{4}$” (10-20mm)	1 Set.
32.	Electric soldering Iron	125 W.	1 No.
33.	Spanner adjustable	12” /300 mm.	1 No.
34.	Hammer chipper	$\frac{1}{2}$” lb	1 No.
WORKSHOP FURNITURE			
35.	Table/Desk		01 per trainee
36.	Stool/chair		01 per trainee
37.	Table for Teacher		01 per classroom
38.	Chair for Teacher		01 per classroom
39.	Black Board with easel		01 set.
40.	Charts		01 set.

INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND ENGINEERING DRAWING

TRADE: ATTENDANT OPERATOR DAIRY

LIST OF TOOLS& EQUIPMENTS FOR - 20 APPRENTICES

1) **Space Norms** : 45 Sq. m.(For Engineering Drawing)

2) Infrastructure:

A : TRAINEES TOOL KIT:-			
Sl. No.	**Name of the items**	**Specification**	**Quantity**
1.	Draughtsman drawing instrument box		21
2.	Set square celluloid	45^o (250 X 1.5 mm	21
3.	Set square celluloid	30^o-60^o (250 X 1.5 mm	21
4.	Mini drafter		21
5.	Drawing board	700mm x500 mm IS: 1444	21
B : Furniture Required			
Sl. No.	**Name of the items**	**Specification**	**Quantity**
1	Drawing Board		20
2	Models : Solid & cut section		as required
3	Drawing Table for trainees		as required
4	Stool for trainees		as required
5	Cupboard (big)		01
6	White Board	(size: 8ft. x 4ft.)	01
7	Trainer's Table		01
8	Trainer's Chair		01

TOOLS & EQUIPMENTS FOR EMPLOYABILITY SKILLS		
Sl. No.	**Name of the Equipment**	**Quantity**
1.	Computer (PC) with latest configurations and Internet connection with standard operating system and standard word processor and worksheet software	10 Nos.
2.	UPS - 500VA	10 Nos.
3.	Scanner cum Printer	1 No.
4.	Computer Tables	10 Nos.
5.	Computer Chairs	20 Nos.
6.	LCD Projector	1 No.
7.	White Board 1200mm x 900mm	1 No.
Note: - Above Tools & Equipments not required, if Computer LAB is available in the institute.		

ANNEXURE-II

FORMAT FOR INTERNAL ASSESSMENT

Name & Address of the Assessor :			**Year of Enrollment :**
Name & Address of ITI (Govt./Pvt.) :			**Date of Assessment :**
Name & Address of the Industry :			**Assessment location: Industry / ITI**
Trade Name :	**Semester:**		**Duration of the Trade/course:**
Learning Outcome:			

Sl. No	Candidate Name	Father's/Mother's Name	Safety consciousness	Workplace hygiene	Attendance/ Punctuality	Ability to follow Manuals/ Written instructions	Application of Knowledge	Skills to handle tools & equipment	Economical use of materials	Speed in doing work	Quality in workmanship	VIVA	Total internal assessment Marks	Result (Y/N)
Maximum Marks (Total 100 Marks)			**15**	**5**	**10**	**5**	**10**	**10**	**5**	**10**	**15**	**15**		
1														
2														