

FOOD BEVERAGES

NSQF LEVEL- 6



SECTOR- FOOD INDUSTRY

COMPETENCY BASED CURRICULUM
CRAFT INSTRUCTOR TRAINING SCHEME (CITS)



GOVERNMENT OF INDIA
Ministry of Skill Development & Entrepreneurship
Directorate General of Training
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
EN-81, Sector-V, Salt Lake City, Kolkata – 700091

FOOD BEVERAGES

(Non-Engineering Trade)

SECTOR – FOOD INDUSTRY



CRAFT INSTRUCTOR TRAINING SCHEME (CITS)

Skill India
कौशल भाजन कुशल भारत
NSQF LEVEL - 6

Developed By

Government of India
Ministry of Skill Development and Entrepreneurship

Directorate General of Training
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE

EN-81, Sector-V, Salt Lake City,
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Skill India
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1. COURSEOVERVIEW

The Craft Instructor Training Scheme is operational since inception of the Craftsmen Training Scheme. The first Craft Instructors' Training Institute was established in 1948. Subsequently, 6 more institutes namely, Central Training Institute for Instructors (now called as National Skill Training Institute (NSTI), NSTI at Ludhiana, Kanpur, Howrah, Mumbai, Chennai and Hyderabad were established in 1960's by DGT. Since then the CITS course is successfully running in all the NSTIs across India as well as in DGT affiliated institutes viz. Institutes for Training of Trainers (IToT). This is a competencybased course of one year duration. "Food Beverages" CITS trade is applicable for Instructors of "Food Beverages" CTS Trade.

The main objective of Craft Instructor training programme is to enable Instructors explore different aspects of the techniques in pedagogy and transferring of hands-on skills so as to develop a pool of skilled manpower for industries, also leading to their career growth & benefiting society at large. Thus promoting a holistic learning experience where trainee acquires specialized knowledge, skills & develops attitude towards learning & contributing in vocational training ecosystem.

This course also enables the instructors to develop instructional skills for mentoring the trainees, engaging all trainees in learning process and managing effective utilization of resources. It emphasizes on the importance of collaborative learning & innovative ways of doing things. All trainees will be able to understand and interpret the course content in right perspective, so that they are engaged in & empowered by their learning experiences and above all, ensure quality delivery.

2. TRAINING SYSTEM

2.1 GENERAL

CITS courses are delivered in National Skill Training Institutes (NSTIs) & DGT affiliated institutes viz., Institutes for Training of Trainers (IToT). For detailed guidelines regarding admission on CITS, instructions issued by DGT from time to time are to be observed. Further complete admission details are made available on NIMI web portal <http://www.nimionlineadmission.in>. The course is of one-year duration. It consists of Trade Technology (Professional skills and Professional knowledge), Training Methodology and Engineering Technology/ Soft skills. After successful completion of the training programme, the trainees appear in All India Trade Test for Craft Instructor. The successful trainee is awarded NCIC certificate by DGT.

2.2 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of one year:

| S No. | Course Element | Notional Training Hours |
|-------|---------------------------------------|-------------------------|
| 1. | Trade Technology | |
| | Professional Skill (Trade Practical) | 640 |
| | Professional Knowledge (Trade Theory) | 240 |
| 2. | Soft skills | |
| | Practical | 100 |
| | Theory | 100 |
| 3. | Training Methodology | |
| | TM Practical | 320 |
| | TM Theory | 200 |
| | Total | 1600 |

2.3 CAREER PROGRESSION PATHWAYS

- Can join as an Instructor in vocational training Institute/ technical Institute.
- Can join as a supervisor in Industries.

2.4 ASSESSMENT & CERTIFICATION

The CITS trainee will be assessed for his/her Instructional skills, knowledge and attitude towards learning throughout the course span and also at the end of the training program.

a) The Continuous Assessment (Internal) during the period of training will be done by **Formative Assessment Method** to test competency of instructor with respect to assessment criteria set against each learning outcomes. The training institute has to maintain an individual trainee portfolio in line with assessment guidelines. The marks of internal assessment will be as per the formative assessment template provided on www.bharatskills.gov.in

b) The **Final Assessment** will be in the form of **Summative Assessment Method**. The All India Trade Test for awarding National Craft Instructor Certificate will be conducted by DGT as per the guidelines of DGT. The learning outcome and assessment criteria will be the basis for setting question papers for final assessment. The external examiner during final examination will also check the individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS CRITERIA

| S No. | Subject | | Marks | Internal Assessment | Full Marks | Pass Marks | |
|-------------|----------------------|-----------------|------------|---------------------|------------|------------|---------------------|
| | | | | | | Exam | Internal Assessment |
| 1. | Trade Technology | Trade Theory | 100 | 40 | 140 | 40 | 24 |
| | | Trade Practical | 200 | 60 | 260 | 120 | 36 |
| 2. | Soft skills | Practical | 50 | 25 | 75 | 30 | 15 |
| | | Theory | 50 | 25 | 75 | 20 | 15 |
| 3. | Training Methodology | TM Practical | 200 | 30 | 230 | 120 | 18 |
| | | TM Theory | 100 | 20 | 120 | 40 | 12 |
| Total Marks | | | 700 | 200 | 900 | 370 | 120 |

The minimum pass percent for Trade Practical, TM Practical, Soft Skills Practical Examinations and Formative assessment is 60% & for all other subjects is 40%. There will be no Grace marks.

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 the assessment. While assessing; the major factors to be considered are approaches to generate solutions to specific problems by involving standard/non-standard practices.

Due consideration should also be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/waste as per procedure, behavioral attitude, sensitivity to the 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 of the following:

- Demonstration of Instructional Skills (Lesson Plan, Demonstration Plan)
- Record book/daily diary
- Assessment Sheet
- Progress chart
- Video Recording
- Attendance and punctuality
- Viva-voce
- Practical work done/Models
- Assignments
- Project work

Evidences and records of internal (Formative) assessments are to be preserved until forthcoming examination for audit and verification by examining 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 should be well versed with instructional design, implement learning programme and assess learners which demonstrates attainment of an acceptable standard of crafts instructorship with occasional guidance and engage students by demonstrating good attributes of a trainer. | <ul style="list-style-type: none"> • Demonstration of fairly good skill to establish a rapport with audience, presentation in orderly manner and establish as an expert in the field. • Average engagement of students for learning and achievement of goals while undertaking the training on specific topic. • A fairly good level of competency in expressing each concept in terms the student can relate, draw analogy and summarize the entire lesson. • Occasional support in imparting effective training. |
| (b) Weightage in the range of 75%-90% to be allotted during assessment | |
| For performance in this grade, the candidate should be well versed with instructional | <ul style="list-style-type: none"> • Demonstration of good skill to establish a rapport with audience, presentation in |

| | |
|---|--|
| <p>design, implement learning programme and assess learners which demonstrates attainment of reasonable standard of crafts instructorship with little guidance and engage students by demonstrating good attributes of a trainer.</p> | <p>orderly manner and establish as an expert in the field.</p> <ul style="list-style-type: none"> • Above average engagement of students for learning and achievement of goals while undertaking the training on specific topic. • A good level of competency in expressing each concept in terms the student can relate, draw analogy and summarize the entire lesson. • Little support in imparting effective training. |
| <p>(c) Weightage in the range of more than 90% to be allotted during assessment</p> | |
| <p>For performance in this grade, the candidate should be well versed with instructional design, implement learning programme and assess learners which demonstrates attainment of high standard of crafts instructorship with minimal or no support and engage students by demonstrating good attributes of a trainer.</p> | <ul style="list-style-type: none"> • Demonstration of high skill level to establish a rapport with audience, presentation in orderly manner and establish as an expert in the field. • Good engagement of students for learning and achievement of goals while undertaking the training on specific topic. • A high level of competency in expressing each concept in terms the student can relate, draw analogy and summarize the entire lesson. • Minimal or no support in imparting effective training. |

3. GENERAL INFORMATION

| | |
|--|---|
| Name of the Trade | Food Beverages (CITS) |
| Trade code | DGT/4038 |
| NCO – 2015 | 2356.0100,7515.9900 |
| NSQF Level | Level-6 |
| Duration of Craft Instructor Training | One Year |
| Unit Strength (No. of Student) | 25 |
| Entry Qualification | Degree in Food Technology/ Food Engineering/Food processing from recognized University. OR Diploma (Minimum 2 Years) in Food Technology/ Food Engineering/Food processing from recognized Board/ University. OR NTC/NAC in Food Beverage or related trades. |
| Minimum Age | 18 years as on first day of academic session. |
| Space Norms | Lab Space - 120 Sq. m Quality lab - 40 Sq. m |
| Power Norms | 6 KW |
| Instructor's Qualification for | |
| 1. Food Beverages (CITS) Trade | B.Voc/ Degree in Food Technology/Food Engineering/Food processing from AICTE/ UGC recognized University with two years experience in relevant field. OR Diploma (Minimum 2 Years) in Food Technology/Food Engineering/Food processing from recognized University /Board or relevant Advanced Diploma (Vocational) from DGT with five years experience in relevant field. OR NTC/ NAC passed in Food Beverage Trade with seven years experience in relevant field. Essential Qualification: National Craft Instructor Certificate (NCIC) in Food Beverage Trade in any of the variants under DGT. |
| 2. Soft skills | MBA/ BBA / Any Graduate/ Diploma in any discipline from AICTE/ UGC recognized College/ university with Three years' experience and short term ToT Course in Soft Skills from DGT institutes. (Must have studied English/ Communication Skills and Basic Computer at |

| | 12th / Diploma level and above) | | | | | |
|--|---|--------------|-------------|-----------|----------------------|---------|
| 3. Training Methodology | <p>B.Voc/ Degree in any discipline from AICTE/ UGC recognized College/ university with two years experience in training/ teaching field.</p> <p style="text-align: center;">OR</p> <p>Diploma in any discipline from recognized board / University with five years experience in training/teaching field.</p> <p style="text-align: center;">OR</p> <p>NTC/ NAC passed in any trade with seven years experience in training/ teaching field.</p> <p>Essential Qualification: National Craft Instructor Certificate (NCIC) in any of the variants under DGT / B.Ed /ToT from NITTTR or equivalent.</p> | | | | | |
| 4. Minimum Age for Instructor | 21 Years | | | | | |
| Distribution of training on Hourly basis: (Indicative only) | | | | | | |
| Total Hrs. /week | Trade Practical | Trade Theory | Soft skills | | Training Methodology | |
| | | | Practical | Theory | Practical | Theory |
| 40 Hours | 16 Hours | 6 Hours | 2.5 Hours | 2.5 Hours | 8 Hours | 5 Hours |

4. JOB ROLE

Brief Description of Job Roles:

Food Beverage processing Instructor is able to impart training and supervise the production, quality control, storage, bottling and Packaging of Food Beverage processing plant. Instructor can be able to handle the food beverage processing machines/tools/ equipment during the preparation of packaged water, Fruit juice, Non Alcoholic Beverage such as Tea and Coffee, Alcoholic Beverage such as beer, wine, rum, whisky etc. Food Beverage processing Instructor is able to impart training on food safety standards:

- a) Quality Analyst in Food Beverages industry.
 - Supervisor in Food Beverage Industry.
 - Packaging Supervisor in Food Beverage industry.
 - Skilled worker in Food Beverage MNCs.
 - Small Entrepreneur in Food Beverage processing.

Manual Training Teacher/Craft Instructor; instructs students in ITIs/Vocational Training Institutes in respective trades as per defined job role. Imparts theoretical instructions for the use of tools & equipments of related trades and related subjects. Demonstrate process and operations related to the trade in the workshop; supervises, assesses and evaluates students in their practical work. Ensures availability & proper functioning of equipment and tools in stores.

Food and Beverages Tasters and Graders, Other includes workers who inspect, taste and grade various types of agricultural products, food and beverages not elsewhere classified.

Reference NCO 2015:

- a) 2356.0100-Manual Training Teacher/Craft Instructor
- b) 7515.9900-Food and Beverage Tasters and Graders, Other

5. LEARNING OUTCOME

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

5.1 LEARNING OUTCOMES (TRADE TECHNOLOGY)

1. Explain the scope, importance, industrial growth and safety measures to be followed in food beverages market.
2. Demonstrate selection of equipments and machineries for food and beverage industry, maintenance of equipments, troubleshooting and repair of machineries.
3. Analyse water sample and explain the techniques of purification of water for preparation of packaged drinking water.
4. Demonstrate extraction of fruits, addition of sugar & preservatives as per standards and utilization of industry wastes.
5. Evaluate processing of Non Alcoholic Beverages (Tea and Coffee) as per standards.
6. Evaluate preparation, packaging, labelling and storage of carbonated water and carbonated non alcoholic drinks as per standard.
7. Demonstrate commercial processing of various alcoholic beverages viz. beer, whisky, wine etc. as per standards.
8. Explain the preventive approach to food safety from biological, chemical, and physical hazards in production processes based on FAO, WHO, ISO etc standards.
9. Check WVTR, thermal resistance, bursting, tensile, tearing strengths and drop test during bottling and packaging of processed products.

6. COURSE CONTENT

| SYLLABUS FOR FOOD BEVERAGES – CITS TRADE | | | |
|--|---|--|---|
| TRADE TECHNOLOGY | | | |
| Duration | Reference Learning Outcome | Professional Skills (Trade Practical) | Professional Knowledge (Trade Theory) |
| Practical 32Hrs Theory 12Hrs | Explain the scope, importance, industrial growth and safety measures to be followed in food beverages market. | 1. Safety measures <ul style="list-style-type: none"> • 5s techniques in the food beverages plant. • Precautions to be observed while working in the food beverages plant. • Handling & maintenance of equipments & machineries. 2. List of different carbonated and non carbonated, alcoholic and non alcoholic beverages available in the market. | Importance of safety, safety precautions & first aid. Concept of 5S & 7QC tools, time management as employed for quality circle. Importance of healthy and hygienic environment. Application and safety to be observed while handling hand tools, special tools, equipments & machineries. Importance and types of maintenance of vehicles/engines. Safely handling of hazardous materials. Food beverage a) Scope of food beverages industry. b) Importance of beverage in modern life. c) Industrial growth and development. |
| Practical 64Hrs Theory 24Hrs | Demonstrate selection of equipments and machineries for food beverage industry, maintenance of equipments, troubleshooting and repair of machineries. | 3. Handling and operation of all equipment. 4. Maintenance of equipments & machineries. 5. Preventive maintenance of equipments & machineries. 6. Identification and rectification of faults in machines. | Primary processing machinery: a) Principle and working of equipments used in beverage industry e.g., sand filters, membrane filters, ion exchangers, juice extractor, pulper, fermenter, vinegar generator, crown corking machine, bottle filling machine, Soda water machine, basket press, filter press, carbonation machine and labelling machine, b) Maintenance of machines. |
| Practical 80Hrs Theory 30Hrs | Analyse water sample and explain the techniques of purification of | 7. General purification techniques of water. 8. Quality of packaged water. | Packaged drinking water: a) Pre-treatment of water for beverages. b) Different types of water. |

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| | water for preparation of packaged drinking water. | <p>9. Qualitative analysis of water sample.</p> <p>10. Determination of hardness of potable water by different methods.</p> <p>11. Determination of alkalinity of potable water.</p> <p>12. Determination of chloride content of potable water.</p> <p>13. Preparation of solution of different concentration (normality, molarity, ppm, ppb and % solution)</p> | c) Principle and method for production of packaged drinking water. |
| Practical 80Hrs Theory 30Hrs | Demonstrate extraction of fruits, addition of sugar & preservatives as per standards and utilization of industry wastes. | <p>14. Extraction of juice from different fruits.</p> <p>15. Preservation of fruits juices with addition of preservative.</p> <p>16. Determination of Brix (TSS), pH, sugar acid ratio and % acidity of juices.</p> <p>17. Utilization of fruit beverage industry waste.</p> <p>18. Material calculation of Fruit Beverages as per FSSAI.</p> <p>19. Preparation and bottling of common fruit beverages such as squashes, crushes, cordials, syrups, nectars, R.T.S.</p> <p>20. Estimation of preservative.</p> <p>21. Clarification of fruit juices.</p> | <p>Fruit Beverages:</p> <p>a) Introduction to different fruits/juices.</p> <p>b) Raw materials used in fruitbeverages, and their properties.</p> <p>c) Machinery involved in differentfruits juice extraction.</p> <p>d) Principle and preparation methods ofReady-To-Serve (RTS), Squash, fruitjuice, nectar, concentrate, syrup, and cordial.</p> <p>Juice Extractions :</p> <p>e) Principle and methods for fruits juice manufacture, machinery used in different fruits juice extraction</p> <p>f) Process flow charts of juice extraction from various fruits.</p> <p>Preservative :</p> <p>g) Definition of Preservatives.</p> <p>h) Types of preservatives commonly used in beverage industry. Limits of usage of preservatives</p> |
| Practical 80Hrs Theory 30Hrs | Evaluate processing of Non Alcoholic Beverages (Tea and Coffee) as per standards. | <p>22. Qualitative analysis of reducing and non-reducing sugars.</p> <p>23. Estimation of caffeine content of tea.</p> | <p>Non Alcoholic Beverages(TEA and COFFEE) :</p> <p>a) Tea types and their nutritional significance.</p> <p>b) Processing of green, oolong,</p> |

| | | | |
|---|--|---|---|
| | | <p>24. Estimation of caffeine content of coffee.</p> <p>25. Detection of roasted chicory in coffee powder.</p> | <p>and black tea.</p> <p>c) Chemical changes during processing of tea.</p> <p>d) Structure and composition of coffee bean.</p> <p>e) Processing of green coffee beans (dry and wet processes).</p> <p>f) Conversion of green coffee into beverage.</p> <p>g) Manufacturing of instant and decaffeinated coffee.</p> <p>h) Chemical changes during coffee processing</p> |
| <p>Practical 112Hrs</p> <p>Theory 42Hrs</p> | <p>Evaluate preparation, packaging, labelling and storage of carbonated water and carbonated non alcoholic drinks as per standard.</p> | <p>26. Preparation of carbonated water.</p> <p>27. Packaging, labelling and storage of carbonated water.</p> | <p>Carbonated water :</p> <p>a) Principle and method of production of carbonated water.</p> <p>b) Quality standards for carbonated water.</p> |
| | | <p>28. Selection of ingredients for carbonated non alcoholic drinks production.</p> <p>29. Preparation of different carbonated non alcoholic drinks.</p> <p>30. Packaging of soft drinks (PET and glass bottle and can)</p> <p>31. Quality testing in carbonated non alcoholic drinks.</p> | <p>Carbonated non alcoholic drinks:</p> <p>a) Technology of carbonated non alcoholic drinks.</p> <p>b) Role of ingredients.</p> <p>c) Food additives used in carbonated non alcoholic drinks.</p> <p>d) Quality control in a carbonated non alcoholic drinks manufacturing industry.</p> |
| <p>Practical 96Hrs</p> <p>Theory 36Hrs</p> | <p>Demonstrate commercial processing of various alcoholic beverages viz. beer, whisky, wine etc. as per standards.</p> | <p>32. Selection of ingredients for the production of whiskey, beer, wine, rum, brandy.</p> <p>33. Visual inspection of beer, whiskey, wine, rum and brandy.</p> <p>34. Preparation of wine.</p> <p>35. Preparation of cider.</p> <p>36. Quality testing in alcoholic beverages.</p> <p>37. Industrial visit of alcoholic beverages industry.</p> | <p>Alcoholic Beverages :</p> <p>a) Commercial process details of manufacturing of alcoholic beverages like beer, whiskey, wine, rum and brandy.</p> <p>b) Role of ingredients used in production of various alcoholic beverages.</p> <p>c) Nutritional and energy values of alcoholic beverages.</p> |

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|---|---|--|---|
| <p>Practical 32Hrs Theory 12Hrs</p> | <p>Explain the preventive approach to food safety from biological, chemical, and physical hazards in production processes based on FAO, WHO, ISO etc standards.</p> | <p>38. Application of HACCP and GMP in Food beverage industry. 39. Sensory analysis of beverages.</p> | <p>a) Food standards and regulations: b) Overview of Food Safety and Standards c) Act 2006, BIS, ISO-22000, Agmark, HACCP, d) International Food Standards. International food laws and regulatory agencies: e) International Organizations - FAO (Food & Agriculture f) Organization), WHO (World g) Health Organization), Codex Alimentarius, ISO, WTO. h) National Organizations - ICMR, ICAR, Council for social welfare, International Food Control Systems including CODEX GMP. i) Importance of personal Hygiene, Cleaning & Sanitary standards of food beverage industry. j) Safety aspects of beverages. k) Safety assessment of food contaminants and pesticide residues.</p> |
| <p>Practical 64Hrs Theory 24Hrs</p> | <p>Check WVTR, thermal resistance, bursting, tensile, tearing strengths and drop test during bottling and packaging of processed products.</p> | <p>40. Practical demonstration of bottle filling machine. 41. Bursting strength, Tensile strength, Tearing strength and Drop test.</p> | <p>a) Need and importance of packaging. b) Types of packaging materials e.g. paper, glass, metal and plastic. c) Quality standards for packed processed products. d) Packaging evaluation: WVTR, GTR, thermal resistance, bursting strength, tensile strength, tearing strength, drop test. e) Label types: Function and regulations.</p> |

SYLLABUS FOR CORE SKILLS

1. Training Methodology(TM)(Common for all CITS trades) (320 Hrs + 200 Hrs.)
2. Soft Skills(100Hrs + 100 Hrs.)

Learning outcomes, assessment criteria, syllabus and Tool List of above Core Skills subjects which is common for a group of trades, provided separately in www.bharatskills.gov.in

7. ASSESSMENT CRITERIA

| LEARNING OUTCOME | ASSESSMENT CRITERIA |
|--|--|
| TRADE TECHNOLOGY (TT) | |
| 1. Explain the scope, importance, industrial growth and safety measures to be followed in food beverages market. | Provide knowledge of the various types of beverages available in world market. |
| | Unique role of beverage industry has in expanding economy. |
| | Market potential for flavoured water in food beverage industry. |
| | Explain 5s & 7QC techniques used in food beverages industry. |
| | Ensure precautions to be observed while working in the food processing plants. |
| | Ensure Healthy and hygienic environment while processing food beverages. |
| | Ensure compliance of safety precautions while handling special tools, equipment & machineries. |
| 2. Demonstrate selection of equipments and machineries for food beverage industry, maintenance of equipments, troubleshooting and repair of machineries. | Demonstrate the equipments used in food beverages industry. |
| | Check the working condition of all the machineries viz. sand filters, ion exchangers, juice extractor etc. |
| | Explain general methods of maintenance of all the equipments and machineries. |
| | Identify faults during operation of these machineries. |
| | Demonstrate troubleshooting and repair of faults in machineries using safety measures. |
| 3. Analyse water sample and explain the techniques of purification of water for preparation of packaged drinking water. | Choose fresh water sample for analysis. |
| | Demonstrate qualitative analysis of water sample. |
| | Check for microbiological quality and turbidity of water. |
| | Assess the hygienic quality of water supply. |
| | Determine the hardness, alkalinity and chloride content of potable water. |
| | Demonstrate pre-treatment of water for beverages. |
| | Evaluate production of packaged drinking water. |
| | Observe safety and hygiene during operation. |
| 4. Demonstrate extraction of fruits, addition of sugar & preservatives as per standards and utilization of industry wastes. | Select fresh and perfect raw ingredients. |
| | Ensure maintenance of perfect hygienic standard. |
| | Demonstrate extraction of fruits for juices and fruit beverages viz. squashes, crushes, cordials etc. preparation. |
| | Determine Brix (TSS) and pH of fruit beverages. |
| | Determine sugar acid ratio and percentage acidity of fruit beverages. |
| | Illustrate the Filling of preserved fruit beverages in sterilized bottles. |
| | Demonstrate the corking and crowning of bottles. |

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| | Demonstrate the Sterilization of the bottles |
| | Demonstrate the Labelling process. |
| | Observe safety measure during the processing of fruit beverages. |
| | |
| 5. Evaluate processing of Non Alcoholic Beverages (Tea and Coffee) as per standards. | Selection of ingredients for tea and coffee beverages. |
| | Demonstrate the chemical changes of tea leaves / coffee powder in water at required temperature during processing. |
| | Determine the caffeine content while preparing Ready-to-Drink (RTD) tea/ coffee. |
| | Detect the roasted chicory content in coffee powder. |
| | Determine the qualitative analysis of reducing and non reducing sugars. |
| | Illustrate filling up of Tea/ Coffee in sterilized bottles/ cans/ tetra packs. |
| | Demonstrate the Labelling process. |
| | Observe safety measure during the processing of tea and coffee beverages. |
| | |
| 6. Evaluate preparation, packaging, labelling and storage of carbonated water and carbonated non alcoholic drinks as per standard. | Check the quality of water for suspended particles, organic matter and bacteria. |
| | Demonstrate the process of filtering, sterilizing and dechlorinating of the water. |
| | Demonstrate mixing of ingredients like sugar and pumping of flavor concentrates in predetermined sequence. |
| | Carbonation added to the finished product by carefully controlling the temperature. |
| | Demonstrate transferring of carbonated water and non alcoholic drinks into PET and glass bottles or cans at extremely high flow rates. |
| | Check for quality standards for allowable dissolved solids, alkalinity, chlorides etc as per standard. |
| | Demonstrate labelling and storage of the processed drinks. |
| | Observe safety measures and hygienic environment during the processing of carbonated water and carbonated non alcoholic drinks. |
| | |
| 7. Demonstrate commercial processing of various alcoholic beverages viz. beer, whisky, wine etc. as per standards. | Select ingredients for processing of alcoholic beverages. |
| | Ensure maintenance of perfect hygienic standard. |
| | Inspect the fermentation process. |
| | Demonstrate the preparation and visual inspection of beer, whiskey, wine, rum and brandy. |
| | Estimate the alcohol content and check for nutritional and energy values. |
| | Demonstrate the Filling of beverage into sterilized bottles. |
| Demonstrate the carbonation process for the Addition of | |

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| | carbon-dioxide gas. |
| | Demonstrate the corking, crowning and labeling of the bottles |
| | Evaluate the detailed project report on industrial visit to any alcoholic beverage industry. |
| | |
| 8. Explain the preventive approach to food safety from biological, chemical, and physical hazards in production processes based on FAO, WHO, ISO etc standards. | Explain the safety aspects of beverages as per Food standards and regulations. |
| | Demonstrate sensory analysis of beverages. |
| | Explain about Act 2006, ISO- 22000, Agmark, HACCP and International Food Standards. |
| | Impart knowledge about various International Food Standards and regulatory agencies viz. FAO (Food & Agriculture Organization), WHO, WTO etc. |
| | Impart knowledge about National regulatory agencies viz. ICMR, ICAR, Council for social welfare, Food Control Systems including CODEX GMP etc. |
| | Explain about the importance of personal Hygiene, Cleaning & Sanitary standards of food beverage industry. |
| | Explain about Safety assessment of food contaminants and pesticide residues. |
| | |
| 9. Check WVTR, thermal resistance, bursting, tensile, tearing strengths and drop test during bottling and packaging of processed products. | Examine the types of packaging material used in food beverage industry. |
| | Demonstrate selection of packing material sample for testing. |
| | Demonstrate selection of machine and tools for testing of the packaging materials. |
| | Assess the quality standards for packed processed products. |
| | Estimate the WVTR, GTR, BURSTING STRENGTH, TENSILE STRENGTH, TEARING STRENGTH, DROP TEST ETC as per packaging material. |
| | Ensure Maintenance of safety and hygienic environment. |

8. INFRASTRUCTURE

| LIST OF TOOLS AND EQUIPMENT - FOOD BEVERAGES (CITS) | | | |
|---|---|--|-------------|
| For batch of 25 candidates | | | |
| S No. | Name of the Tool & Equipment | Specification | Quantity |
| A. Equipment, Machine & Tools | | | |
| 1. | Vacuum filter | | 1 No. |
| 2. | Soda water machine | | 1 No. |
| 3. | Basket press | | 1 No. |
| 4. | Filter press | | 1 No. |
| 5. | Form fill seal machine | | 1 No. |
| 6. | Centrifuge | | 1 No. |
| 7. | Glass jars, various sizes and screw-on caps | | As required |
| 8. | Wooden spoons | | 05 No. |
| 9. | Digital Weighing Balance: Auto Calibration should be provided with respect to temperature. | Capacity: 220 gm Readability: 0.1 mg or 0.0001gm Weighing Pan: 80 mm or large, with wind draft shield | 01 No. |
| 10. | Laboratory Spray dryer | | 1 No. |
| 11. | Complete Lab scale bottling plant for beverage. | 10 litres / hrs | 01 No. |
| 12. | Baby Boiler coil type, Fuel light oil, force circulation 3 pass design. | Capacity of steam output 100kg/hr, fuel firing automatic, Electric supply AC,3 PH, 415 V,50HZ,4 Wire system, Qualified attended not required | 01 No. |
| 13. | Steam jacket kettle double jacketed with indenting lever, steam inlet and outlet with steel trolley and accessories to be fitted with boiler. | upto 25 litres | 01 No. |
| 14. | Deep freezer: High performance freezers with lock, digital display and contact for remote monitoring. Flexible grid dividers can be configured to suit your individual requirement. Features: Digital display, visual alarm, low energy consumption, contact for remote alarm, pull-out defrost drain for easy defrosting, lock, castors and baskets. | Technical specifications: Gross Capacity: 130 Litres. Net Capacity: 130 Litres. Temperature Range: -10°C to -45°C. Ambient Temperature: 30°C. | 01 No. |
| 15. | Vacuum pan | Capacity upto 50 litres evaporation/Driven by motor reduction gear box/inside vessel made up of thick stainless steel plate/outer jacket is of S.S./with | 01 No. |

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| | | mail hole and sight glasses on 2 sides/Stirrer are made of Teflon blades. Fitted with an outer at the bottom and a condensate receiving vessels. | |
| 16. | Mechanical peeler/ Batch type for fruit and vegetable peeling. | | 01 No. |
| 17. | Water purifier with pre filter, activates charcoal / resin unit and UV exposure units. Complete with water supply tank and piping. | | 01 No. |
| 18. | Fruit mill | junior model, upto 20kg/hr with 1/2 hp motor | 01 No. |
| 19. | <p>Pulper:</p> <ul style="list-style-type: none"> Capable of extracting the pulp of fruits such as Mangoes, Guavas, Peaches, Bananas etc. Mounted on heavy duty mild steel stand, the central pulping unit of the machine consists of a pair of brushes fixed on stainless steel shaft and one stainless steel sieve. The gap between the sieve and the brushes should be adjustable The sieve should provided in perforations of different sizes and is easily removable for quick Interchanging and cleaning. | <p>Allcontact parts should be of S. S. - 304Grade stainless steel. Capacity: Upto 10-20 Kg/Hour, Fitted with! / H. P. Motor.</p> | 01 No. |
| 20. | <p>Hot Air Oven:</p> <ul style="list-style-type: none"> Should be double walled unit:- outer chamber should made up of M.S. Sheet duly painted & inner must be made up of S.S. Sheet. Temperature should be controlled by Microprocessor Based PID Digital Temperature Indicator-cum-Controller. Air ventilatorsshould also be provided on the sides & Air Circulation fan be a standard feature. Supply | <p>ambient to 390°C with an accuracy of $\pm 3^{\circ}\text{C}$</p> <p>220/230 Volts A. C. Inner Size (W*D*H): 605*605*605 mm</p> | 01 No. |
| 21. | Refrigerator: | Capacity: 310 Liter dimensions Approx. 580x 1680x 650 mm, door cooling | 01 No. |

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| | | system, humidity controller, deodorizer, door finish vinyl, vegetable tray. Sixth sense cooling system | |
| 22. | Auto claves | 20 lit cap | 01 No. |
| 23. | Juice Extractor | Screw type 1 HP motor | 01 No. |
| 24. | Lime Juice Extractor & orange juice halving & Burring | | 01 No. |
| 25. | Crown corking machine hand/paddle operated one. | | 01 each |
| 26. | PH Meter (Digital) | | 01 No. |
| 27. | Bottle washer | with! HP motor, single phase, two heads for brushes, water spray unit of 10-12 bottles. | 01 No. |
| 28. | Improved stove made up of MS with proper safety measures , | with gas cylinders | 02 No. |
| 29. | Heat Sealing Machine Hand/Pedal Operated | | 01 No. |
| 30. | Liquid filling machine | For filling liquid in bottles, 200ml, 500ml, 1000ml. Manually operated | 01 No. |
| 31. | Electric Mixer | | 02 No. |
| 32. | Lemon Squeezer Stainless steel | | 01 No. |
| 33. | Weighing balance (digital) | 0.01gm (Min) ,5kg (Max), 100kg (Max | 01 Each |
| 34. | Refractometers (Pocket) | 0-32,28-62,58-920 Brix SugarScale | 01 Each |
| 35. | Thermometer (Digital) | | 06 No. |
| 36. | Brinometer (Salinometer) | | 02 Nos. |
| 37. | Hydrometers of different ranges | 0-30, 30-60, 60-90, | 01 each |
| 38. | Brixhydrometer | | As required |
| 39. | Fruit Trays | | 6+2 Nos. |
| 40. | Stainless steel mugs | | 08 Nos. |
| 41. | Stainless steel bowls | | 08 Nos. |
| 42. | Sandashi (Tongs) | | 01 No. |
| 43. | Perforated spoons | S.S.12"Length 4 " dia | 06 Nos. |
| 44. | Coring knife | | 06 Nos. |
| 45. | Pitting knife | | 06 Nos. |
| 46. | Cutting knife | | 06 Nos. |
| 47. | Pilfer proof capping machine | | 01 No. |
| 48. | Can and cork Remover | | As per requirement |
| 49. | Stainless steel trays of assorted size | | 16 Nos. |
| 50. | Stainless steel buckets or stainless buckets | | 06 Nos. |

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| 51. | Spoons, Wooden Ladle | | 16 Nos. |
| 52. | Masons Jars | for 1 gross bottle | 01 No. |
| 53. | Water Tank with tap | 4'x4'z3' | 01 No. |
| 54. | S.S.Vessels with lids. | 20 lit cap | 10 Nos. |
| 55. | S.S. Vessels with lids. | 6 lit cap | 06 Nos. |
| 56. | S.S.Vessels with lids. | 10 lit cap | 06 Nos. |
| 57. | Hand Washing basin with tripod stands | | 03 Nos. |
| 58. | Bottle Stand for | 1 gross bottle | 01 No. |
| 59. | Stainless Steel Pricker | | 06 Nos. |
| 60. | Steel scale | 12" Standard steel | 04 Nos. |
| 61. | Stainless Steel Strainer/Sieve | | 06 Nos. |
| 62. | Electronic Geyser | 25 litre | 01 No. |
| 63. | Stainless steel knife | | 6pcs+16pcs |
| 64. | Spoons of assorted size | | 16pcs |
| 65. | Exhaust fan for lab | | As per requirement |
| 66. | Fire Extinguisher CO2, for Lab and near Boiler | 25kg | As per requirement |
| 67. | Filter press | | 01 No. |
| 68. | Pressure pump for the washing of machines | with 2 nozzles | 01 No. |
| 69. | Carbonation machines with CO2 cylinder | | 01 No. |
| 70. | Continuous water supply for lab | | As required |
| 71. | Computer/laptop for Faculty with Internet Connection with, colour Printer and photo copy Scanner | CPU: 32/64 Bit i3/i5/i7 or latest processor, Speed: 3 GHz or Higher. RAM:-4 GB DDR-III or Higher, Wi-Fi Enabled. Network Card: Integrated Gigabit Ethernet, with USB Mouse, USB Keyboard and Monitor (Min. 17 Inch. Licensed Operating System and Antivirus compatible with trade related software. | 01 No. |
| 72. | LED multimedia Projector | | 01 No. |
| 73. | UPS | | As required |
| 74. | AC | | As required |
| 75. | Labelling machine | | 01 No. |
| 76. | Incubator with thermostat | | 01 No. |
| 77. | Water Bath | | 01 No. |
| 78. | Platform scale balance | 100 Kg Capacity | 01 No. |
| 79. | Seed germinator : Cabinet type, Different chambers, Temp and RH Controller | | 01 No. |
| 80. | Vinegar generator : Chamber made of | | 01 No. |

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| | SS, with sparger and baffles | | |
| 81. | Fermenter : Bioreactor, SS, with sparger and baffles | | 01 No. |
| 82. | Automatic pouch machine / filler sealer machine | | 01 No. |
| 83. | Can body reformer | | 01 No. |
| 84. | Can seamer | | 01 No. |
| 85. | Exhaust box | | 01 No. |
| 86. | Cup sealer | | 01 No. |
| 87. | Steel scale : standard steel | 12 " | 02 Nos. |
| 88. | Steel tape | Scales 1 meter, and of 50 ft | 02 Nos. |
| 89. | Cutting equipments : Different knives, Cutters for fruits | | As required |
| 90. | Sinks : standard size | | 01 No. |
| 91. | Hot plate : Electrical | 2 KW | 01 No. |
| 92. | Tanks SS | 50 liters capacity, cylindrical with cap | 01 No. |
| 93. | Syrup tanks | 50, 100 lit capacity SS | 01 each |
| 94. | Pressure Cooker | 5 Kg and 10 Kg SS | 01 each |
| 95. | SS filter | Sieve type cloth filter, hydraulic, | 01 No. |
| 96. | Bottle opener | Heavy duty, Stainless Steel | 04 Nos. |
| 97. | Stainless steel / Aluminium pots : Different Capacities | | As required |
| 98. | Wooden spoons : Different sizes | | As required |
| 99. | Alcohol Distillation Unit: Distillation unit with fraction distillation unit. | | 01 No. |
| 100. | Abbe Refractometer: Must provide test piece, contact liquid and thermometer in wooden cabinet. Should include Silica Crucible (5 Pc) | Refractive index range 1.3 to 1.7 with an accuracy of 0.001 direct on scale and 0.0001 by estimation. Sugar percentage range 0 to 95% with an accuracy of 1% on scale and 0.1 by estimation. | 01 No. |
| 101. | Fruit crusher: This machine should be suitable for crushing stoneless fruits. Mounted on a heavy dutymild steel stand equipped with motorand starter. The material should be fedinto the stainless steel hopper whichfeeds the product into the crushingdrum, which must consists ofstationery blades and rotary beaterwhich crushes the loaded product. | Capacity: Upto 10-20 Kg/Hour, Fittedwith! / H. P. Motor. | 01 No. |
| 102. | Water Analyzer: Instrument measure pH/mV, | pH: Range 0-14 resolution 0.01pH | 01 No. |

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| | conductivity/ TDS/salinity, dissolved oxygen, temperature, colorimetric-Absorption, % Transmittance, and concentration and turbidity. | Temp.: Range 0-1000 C Resolution: 0.10 C mV: Range +1999 mV Resolution: 1 mV Conductivity : Range 0.1-100micro mho at TDS factor 0.5 approx Salinity : Range 0-40 ppt Resolution: 0.1 ppt D O : Range 0-20ppm Resolution: 0.1 ppm Colorimeter : Range 0-2.50Abs 0-100 % Transmittance Resolution: 0.001 abs, 0.1 % Transmittance Filter : blue, green and red Source: Tungsten lamp Turbidity: Range 0-100NTU Source: Tungsten lamp General: Display: 2 line 20 char, Power: 230 V A C. | |
| 103. | Bursting strength machine, | | 01 No. |
| 104. | Tensile strength machine, | | 01 No. |
| 105. | Tearing strength machine | | 01 No. |
| 106. | Drop tester machine. | | 01 No. |
| B. Consumables Tools & Items | | | |
| 107. | Beaker | 50, 100, 250 ml, 500 ml | 12 Nos. |
| 108. | Conical flask | 50, 100, 250 ml, 500 ml | 12 Nos. |
| 109. | Measuring cylinder | 100ml,250ml, 200 ml, 500ml, | 12 Nos. |
| 110. | Measuring flask of assorted sizes | | 12 Nos. |
| 111. | Burrete of assorted sizes with Burrete stands | | 12 Nos. |
| 112. | Pipettes of assorted sizes | | 12 Nos. |
| 113. | Thermometer Digital | 10°c to 110°C | 16Pcs |
| 114. | Rubber Gloves | | 12 pairs for each |
| 115. | Aprons | | 01 for each |
| 116. | Glass Funnels of assorted sizes | | 12 Nos. |
| 117. | Funnels Separating | 500ml. & 100ml | 12 Nos. |
| 118. | Test Tube With Test tube stand | | 25 Nos. |
| 119. | Glass rod | | 10 Nos. |
| 120. | Gas lighter | | 06 Nos. |
| 121. | Ph meter Rod | | 02 Nos. |
| 122. | Petri dish with cover | | 16 Nos. |

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| 123. | Glass slides | | 16Pcs |
| 124. | Refilling of gas cylinder for lab | | As required |
| 125. | Air tight glass container of different size | | As required |
| 126. | Different types of Empty Tin Can for canning | | As required |
| 127. | Decaling agent for boiler coil | | As required |
| 128. | Fuel (Light oil) for boiler | | As required |
| 129. | Refilling of carbonation machine cylinder | | As required |
| 130. | Label for Labelling machine | | As required |
| 131. | Empty Glass Bottles | 200ml,500ml,1000ml | As required |
| 132. | Syphoning tube | | 6 Nos. |
| 133. | Crown caps | | As required |
| 134. | Buffer solution/ tablets | | As required |
| 135. | Photo Copy Paper A4 | | As required |
| 136. | Scale | | As required |
| 137. | Correcting Fluid pen | | As required |
| 138. | Dusting Cloth | | As required |
| 139. | Pen | | As required |
| 140. | Temporary marker | | As required |
| 141. | Stapler (Small & Big) | | As required |
| 142. | Puncher | | As required |
| 143. | Fevi stick | | As required |
| 144. | Stapler Pin | | As required |
| 145. | Ruled Register | | As required |
| 146. | File Folder | | As required |
| 147. | Vim Liquid | | As required |
| 148. | Dettol Hand wash | | As required |
| 149. | Scotch Bright | | As required |
| 150. | Colin | | As required |
| 151. | Aluminium Foils | | As required |
| 152. | Duster | | As required |
| 153. | Juna | | As required |
| 154. | Raw material required for food beverages | | As required |
| 155. | Seasonal Fruits | | As required |
| 156. | Salt | | As required |
| 157. | Sugar | | As required |
| 158. | Other Chemicals/Raw material Require for Practical's | | As required |
| 159. | Chemicals for cleaning and sanitization of machines/equipments | | As required |

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| 160. | Tissue paper roll | | As required |
| C. FURNITURE | | | |
| 161. | Instructor Chair & Table with Glass | | 01 No. |
| 162. | Magnetic White Board | | 01 No. |
| 163. | Display Board | | 01 No. |
| 164. | Table for computer/printer/scanner with chair | | 01 Set |
| 165. | Dual Desk | | 13Nos. |
| 166. | Working table with | 6-3x21/2 | 05 Nos. |
| 167. | Aluminium tops | | |
| 168. | Stools | | 25Nos. |
| 169. | Laboratory Table with rack and sinks | 8'*2'-6"-6" | 04 Nos. |
| 170. | Racks for keeping books (glass panel) etc | | 01 set |
| 171. | Trainee Locker | | with space for 25 |
| 172. | Storage Rack for Chemicals | | 01 No. |
| 173. | Cup Board (large) | | 04 Nos. |
| 174. | First Aid Box | | 01 No. |
| 175. | Fire Extinguisher | | As required |
| 176. | Almirah | | 02 Nos. |
| 177. | Wooden Show Case For keeping & Display sample | | 02 Nos. |
| 178. | White Board | | 01 No. |

ANNEXURE - I

| List of Expert Members participated/ contributed for finalizing the course curriculum of Food Beverages (CITS) trade | | | |
|---|--|---|------------------------|
| SNo. | Name & Designation Sh./Mr./Ms. | Organization | Remarks |
| 1. | H. V. Samvatsar Director | CSTARI, Kolkata | Chairman |
| 2. | Sanjay Kumar Joint Director of Training | CSTARI, Kolkata | Member |
| 3. | L. K. Mukherjee Deputy Director of Training | CSTARI, Kolkata | Member |
| 4. | Bharat K. Nigam Training Officer | CSTARI, Kolkata | Member/ Coordinator |
| 5. | K.V.S. Narayana Training Officer | CSTARI, Kolkata | Member/ Coordinator |
| 6. | Shiv Biswal Executive Chef | Taj Sats, Air Catering Ltd., Kolkata | Expert |
| 7. | Sowmya Sengupta Training Manager | Hotel Taj Bengal, Kolkata | Expert |
| 8. | Suheli Das HR Executive | Hotel ITC Sonar, Kolkata | Expert |
| 9. | Abdul Wahab Chef De Cuisine | Hyatt Regency, Kolkata | Expert |
| 10. | Nikhil Rajen Merchant Sr Sous Chef | Hotel ITC Sonar, Kolkata | Expert |
| 11. | Shirsendu Karmakar Principal | NIHM Pvt. ITI, Garia, Kolkata | Expert |
| 12. | Anurag Vats Training Officer | CSTARI, Kolkata | Member |
| 13. | Akhilesh Pandey Training Officer | CSTARI, Kolkata | Member |
| 14. | S A Pandav, RDD | Vadodara & Surat, Gujarat | Expert |
| 15. | Anurag Mishra, HR Manager | Welcome Hotel, Vadodara | Expert |
| 16. | Bhavita Vin, Training Co-ordinator | Welcome Hotel, Vadodara | Expert |
| 17. | Piyush kumar Mehta, HR Exe. | Hotel Revival Lords Inn, Vadodara | Expert |
| 18. | Jayesh More, Exe. Housekeeping | Hotel Revival Lords Inn, Vadodara | Expert |
| 19. | Rishi Kashyap, Principal | Gujarat Institute Hotel Management, Vadodara | Expert |
| 20. | Daron Pawar, Sr. Faculty | Gujarat Institute of Hotel Management, Vadodara | Expert |
| 21. | Ranjeet Rajput, HR | Surya Palace Hotel, Vadodara | Expert |

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| 22. | ArunUpadhyay, HR Training | Surya Palace Hotel, Vadodara | Expert |
| 23. | Y.B. Joshi, Principal | Industrial Training Institute, Khambhat | Expert |
| 24. | J.G. Prajapati, Asst. Appr. Advisor | Industrial Training Institute, Tarsali | Expert |

