SYLLABUS

CERTIFICATE COURSE IN QUALITY CONTROL

(C.C.Q.C.)

SUBJECT: SUGAR TECHNOLOGY (THEORY)

CODE: CQ/101 **Maximum Marks :100**

1. Composition of sugar cane. Composition of sugar cane juice. Introduction to terminology used in Sugar Industry

2. Process flow diagram of Defecation process, Double Sulphitation process and refined sugar process.

3. Clarificants used in processing.

4. Brief details of various unit operations such as Milling, Clarification, heating, Evaporation, Pan Boiling (Crystallization), Centrifugation and bagging

5. Role of reducing sugars, phosphate and calcium content during the processing of sugar cane juice

6. BIS standards for plantation white and other sugars, FSSAI standards, Sugar grade as issued by Bureau of Sugar Standard,

7. Measurement of colour of Sugar in Solid Phase (Modulated Reflectance Value)

8. SO_2 Content in Sugar: Total and free SO_2 in sugar, Limit of SO_2 in sugar, Determination of SO_2 by Iodine and p-rosanaline hydrochloride Method.

2 (i) Steam Generation, Water treatment and availability of condensate.

(ii) **Boiler Water Treatment:** Specification of Boiler water, pH, conductivity, Acidity and Alkalinity of boiler water, Scale formation, Corrosion, Condensate Treatment**.** (Sugar Engineering Division)

3 (i) Idea about ISO Certification, NABL accreditation and Good Laboratory Practices etc.

4 (i) Colour: Colourimetry, Lambert Beer's Law, Determination of λ_{max} , Measurement of colour of Sugar in solution Phase by GS9/1/2/2-8 (MOPS Method), GS9/1/2/2-9 (TEA Method) and GS9/1/2/2-10 (ISO Grade water Method),

(ii) Conductivity: Specific Conductance, Molar Conductance and Equivalent Conductance and factors affecting them, Measurement of Conductivity ash.

(iii) Turbidity: Concept of Turbidity, reason for appearance turbidity, Method of determination of turbidity by Turbidity-meter.

(iv) Analytical Chemistry: Concept of Mole, Normality, Molarity, Molality, Formality, ppm, ppb, ppt, Mole Fraction and Equivalent weight

(Physical Chemistry Division)

5 (i) Total Reducing Sugar: Reducing Sugars, Non- Reducing Sugars, Total Reducing Sugars, Fehling-A and Fehling-B solutions, Method for determining TRS.

(ii) Molasses: Molasses, Grades of Molasses, Types of molasses, Method for determining TRS in molasses.

(iii) BOD and COD: Dissolved Oxygen, Biological Oxygen Demand, Chemical Oxygen Demand, Determination of BOD and COD in effluent.

SUBJECT: SUGAR TECHNOLOGY (CHEMICAL CONTROL)

CODE: CQ/102 **Maximum Marks :100**

1. Determination of Pol % cane
2. Mill Extraction (M.E.)
3. Reduced Mill Extraction (R.M.E.)
4. SJM Formula
5. Reduced Boiling House Recovery (R.B.H.R.)
6. Brix Curve
7. Pol Balance
8. Brix Balance
9. Non Sugar Balance
10. Calculation of Recovery etc.
11. Actual vs. theoretical molasses % cane
12. Actual Vs Theoretical molasses % cane

SUBJECT: SUGAR TECHNOLOGY (PRACTICAL)

CODE: CQ/103 **Maximum Marks: 200**

Sugar Technology Division

(i) Brix / Pol / Purity of juice/molasses/massecuite and other sugar house products
(ii) Sucrose %, P_2O_5, CaO Content in mixed juice and clear juice etc
(iii) Crystal % massecuite
(iv) Size & shape of crystal
(v) Moisture % sugar
(vi) Pol and Moisture % Bagasse
(vii) Pol % Press cake
(viii) Preparatory Index of cane
(ix) Determination of Total and free SO_2 content in sugar by Iodine and p-rosanaline hydrochloride

Physical Chemistry Division

(i) Measurement of colour of sugar in solution phase by GS9/1/2/2-8, GS9/2/2/2-9 and GS9/1/2/2-10 method.
(ii) Measurement of Conductivity ash in sugar by ICUMSA Method.
(iii) Determination of turbidity in sugar by Turbidity-meter and calibration of Turbidity meter.
(iv) Determination of pH of sugar solution by pH-meter and calibration of pH meter.
(v) Determination of specific conductivity of sugar solution by Conductivity-meter and calibration of Conductivity-meter.
(vi) Determination of conductivity-ash of sugar solution by ICUMSA method.
(vii) Preparation and standardization of solutions of different concentration.

Biochemistry Division

(i) Determination of RS and TRS in Molasses.
(ii) Determination of BOD and COD in effluent.
(iii) DO in feed water, boiler water, blow down water and various condensate.

Agriculture chemistry Division

(i) TSS, (ii) TDS, (iii) Hardness, (iv)Silica content,
(v) Phosphate in feed water, boiler water, blow down water and various condensate.